Radio Purchase Authorization Justification

Carson City has historically utilized Motorola Solutions radio equipment. In order to deliver reliable communications capability at the lowest possible cost the communications division now supports Harris Corporation and Motorola Solutions equipment. The communications division will continue to strive for the best value in Public Safety Communications without compromising the safety of our Residents, Visitors, First Responders, and Employees. The authorization of Joinder contracts for radio equipment delivers flexibility, efficiency, and savings while providing for the continued support of the existing infrastructure and subscriber equipment. The existing inventory contains approximately 900 subscriber radios (portable {handheld} and mobile {vehicle}) of which the vast majority are Motorola. Before FY18 radio replacement was the responsibility of the end-user department. The communications division was not funded for the replacement of subscriber radios. Recognizing that the radio inventory was comprised of a range of equipment at or approaching end of life, an annual 10% replacement target was adopted for subscriber radios to allow for a 10 year refresh rate.

FY19 Projects / Budget		
Subscriber Radio Replacement	560-3055-419.06-76[1]	275,000
Infrastructure Radio Replacement/Improvement	560-3055-419-06-76[1]	161,414
Miscellaneous Department Requests[2]		63,586
	Total	**500,000**

[1] Technical Equipment-FY19 Budget $436,414

[2]Approximately $63,586 will be used to cover anticipated end-user department requests in line with historical annual expenditures from the budgets of the requesting departments.

Previous Board Actions:

20180920 BOS approved joinder contracts to Harris Corp and Motorola and authorized an amount not exceed $500,000 through June 30, 2019

20180504 BOS approved a joinder to Harris Corp and Motorola and authorized an additional $50,000 each through the remainder of the Fiscal Year.

20180405 BOS approved the purchase of 53 replacement radios for $258,233.62 through NASPO joinder.

20170327 BOS approved a purchase through Joinder for $65,897.33 including $15,897.33 for seven replacement radios and an additional $50,000 for end-user purchases through the remainder of the FY.

20160602 BOS approved purchase of 23 radios for$58,956.15 through NASPO joinder.

WASHOE COUNTY
TECHNOLOGY SERVICES

1001 E. Ninth St
RENO, NEVADA 89512
(775) 328-2351

James Jacklett
3505 Butti Way
Carson City, NV 89701

Mr. Jacklett,

Carson City is authorized to purchase end-user radio equipment through the System Purchase Agreement between Harris Corporation and Washoe County dated 9/27/2018. Any purchase order (PO) referencing the agreement shall include the following text:

The terms and conditions of this Purchase Order are governed by the System Purchase Agreement between Harris Corporation and Washoe County, dated 9/27/2018.

Please also carbon copy (cc) Washoe County Technology Services, using the contact information below, on any POs referencing the System Purchase Agreement between Harris Corporation and Washoe County dated 9/27/2018.

Please direct any questions on this authorization to Quinn Korbulic – qkorbulic@washoecounty.us.

Carbon Copy Contact:

Sara Delozier
sdelozier@washoecounty.us
Washoe County Technology Services
1001 E. Ninth St.
Reno, NV 89512

Thank you,

Quinn Korbulic, IT Manager
Washoe County, Technology Services

HARRIS®

TECHNOLOGY TO CONNECT,
INFORM AND PROTECT™

SYSTEM PURCHASE AGREEMENT

BETWEEN

WASHOE COUNTY

(Buyer)

and

HARRIS CORPORATION
COMMUNICATION SYSTEMS SEGMENT
(Seller)

DATE: Sept. 27, **2018**

SYSTEM PURCHASE AGREEMENT

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D. INDEMNIFICATION AND INSURANCE SPECIFICATIONS

SYSTEM PURCHASE AGREEMENT

THIS SYSTEM PURCHASE AGREEMENT ("Agreement") is made and entered into this 27th day of Sept, 2018 ("Effective Date"), by and between WASHOE COUNTY, 1001 E. Ninth St. Reno Nevada, 89520, (hereinafter referred to as "Buyer") and Harris Corporation, a Delaware corporation, acting through its Communication Systems Segment (hereinafter referred to as "Seller") together the ("Parties").

WITNESSETH:

WHEREAS, The State of Nevada, acting by and through its Department of Transportation, Washoe County, Nevada, a political subdivision of the State of Nevada, and Nevada Energy, ("**NSRS Members**") previously entered into that certain contract Nevada Shared Radio System Contract, dated as of May 9, 2017 (the "**Member Agreement**"), pursuant to which the NSRS members issued a Request for Proposal entitled "REVISED REQUEST FOR PROPOSAL, 697-16-016, Project Specifications and Instructions for Submitting a Proposal to furnish Nevada Shared Radio Replacement Project"(collectively, the "RFP") requesting proposals to provide NSRS Members with a radio communications System and services ("**Nevada Shared Radio System"),** as set forth in the RFP.

WHEREAS Buyer has selected Seller's Proposal and now desires to enter into this Agreement with Seller to provide Buyer with the radio communications and services that Buyer requires to support its obligations under the Member Agreement and as set forth in the Scope of Work attached to this Contract as an exhibit.

Nevada Shared Radio System, when fully implemented for each NSRS Member, will incorporate sub-systems for each NSRS Member, while together operating as an integrated statewide communication system providing communication for all NSRS Members. The Nevada Shared Radio System, as designed by Seller, will only operate as an integrated statewide communication system when all NSRS Members have contracted with Buyer to provide each NSRS Members' sub-system of the total system. The Nevada Shared Radio System will be implemented for all NSRS Members simultaneously on a regional basis as set forth in the Scope of Work attached to this Contract as an exhibit. ("**Shared Regional Implementation**").

WHEREAS Buyer and Seller desire to enter into this Agreement to set forth in writing their respective rights, duties and obligations hereunder.

NOW, THEREFORE, for and in consideration of the mutual promises contained herein and other good and valuable consideration, the sufficiency and receipt of which are hereby acknowledged, it is mutually agreed between the Buyer and Seller as follows:

SECTION 1. DEFINITIONS:

As used herein, the terms set forth below shall have meanings set forth below.

A. "Acceptance" shall mean Acceptance of the System as set forth in the Testing and Acceptance section of this Agreement.

B. "Acceptance Date" shall mean the date the System is accepted as set forth in the Testing and Acceptance section of this Agreement.

C. "Acceptance Tests" shall mean the testing procedures attached to the Statement of Work and mutually agreed upon by Buyer and Seller to be performed to determine whether the System has met the Acceptance criteria either set forth in the Statement of Work attached to this Agreement as an exhibit or as mutually agreed upon in writing by Buyer and Seller.

D. "Certificate of Insurance" shall mean the certificate to be provided by Seller evidencing the insurance coverage of Seller.

E. "Change Order" shall mean a written modification to the Total Agreement Price, Project Schedule or other Agreement terms which is signed by both Parties.

F. "Detailed Design Documents" shall mean those documents deliverable by Seller to Buyer at the conclusion of the Detailed Design Review described in the subsection Detailed Design Review under the Project Management Planning section of this agreement.

G. "Detailed Design Review" or "DDR" shall have the meaning given in the subsection Detailed Design Review under the Project Management Planning section of this agreement.

H. "Documentation Deliverables" shall mean the standard commercial quality manuals to be furnished by the Seller to the Buyer pursuant to the terms set forth in the Statement of Work attached to this Agreement as an exhibit and this Agreement.

I. "Effective Date of the Agreement" shall be the date on which the Agreement is signed by the last of the parties to sign the Agreement. The "Effective Date" shall be the date inserted on the first page of the Agreement.

J. "Expiration Date" shall mean the date on which the Term of this Agreement shall end which shall be the end of the Warranty Period (as defined in the Warranty Section) except that some other sections of this Agreement may have a later end date for that section of the Agreement as specifically provided in those sections of this Agreement.

K. "Final System Acceptance" shall mean the Final Acceptance for the NSRS pursuant to section 13 paragraph E.

L. "Hardware" shall mean, collectively, the Terminal Hardware and Infrastructure Hardware, as defined below.

M. "Infrastructure Hardware" shall mean the equipment, goods, and materials to be supplied by Seller for the System infrastructure, as further described in the Statement of Work attached to this Agreement as an exhibit.

N. "Project Kick-Off Meeting" shall have the meaning given in the Project Management and Planning section of this Agreement.

O. "Project Manager" shall mean each respective Party's duly authorized representative designated to manage each Party's Project obligations.

P. "Project Schedule" shall mean the schedule attached to the Statement of Work or otherwise mutually agreed upon by Seller and Buyer in writing for the delivery of the Hardware and Software and the performance of the Services described in the Statement of Work attached to this Agreement as an exhibit.

Q. "Project Sites" shall mean those sites where any construction work is performed or any Infrastructure Hardware is installed under the terms of this Agreement. The term "Project Sites" will include all of the Tower Sites (as defined below).

R. "Punch list" shall mean a list of non-service affecting defects in the appearance, operation or installation of the system infrastructure hardware, which the seller shall promptly resolve.

S. "Responsibility Matrix" shall mean the table included in the Statement of Work attached to this Agreement as an exhibit, which depicts the roles and responsibilities of Seller and Buyer set forth this Agreement.

T. "RFP" shall mean Buyer's request for proposal as described in the recitals of this Agreement.

U. "Services" or "Work" shall mean the services and work to be provided by Seller to Buyer included in the Statement of Work attached to this Agreement as an exhibit.

V. "Software" shall mean the proprietary computer software of Seller as owned exclusively by Seller or Seller's suppliers, as appropriate, and as further defined in and licensed to Buyer pursuant to the terms of the Software License Agreement.

W. "Software License Agreement" shall mean the System Software License Agreement set forth in an exhibit attached to this Agreement.

X. "Statement of Work" shall mean the description of the work to be performed by Seller to deliver the Hardware, install the System and provide the Services, all as described in an exhibit attached to this Agreement.

Y. "System" shall mean the radio communications System comprised of the Hardware and Software to be furnished by Seller to Buyer pursuant to the terms set forth in the Statement of Work attached to this Agreement as an exhibit.

Z. "Terminal Hardware" shall mean mobile units, portable units, control stations and related accessories to be provided by Seller as listed in the Statement of Work attached to this Agreement as an exhibit.

AA. "Subcontractor" shall mean a business or individual not employed by Seller and contracted with Seller to perform work on behalf of Seller.

BB. "Total Agreement Price" shall mean the price of the Hardware, the Software license and the Services to be furnished by Seller to Buyer pursuant to the terms set forth in the Statement of Work attached to this Agreement as an exhibit and this Agreement.

CC. "Tower Sites" shall mean those sites where equipment will be installed on existing or new towers as included in the Seller's Proposal and to be finalized in the Detailed Design Documents or subsequent Change Orders.

SECTION 2. SCOPE OF WORK:

A. Seller shall furnish, deliver and install the Hardware and Software for the System and provide the Documentation Deliverables and Services in accordance with the terms of the Statement of Work, attached to this Agreement as an exhibit, the Project Schedule and this Agreement.

B. The Detailed Design Documents, as described in the Project Management and Planning section of this Agreement and as amended by mutual agreement in writing by the Parties, shall be incorporated into this Agreement after the Detailed Design Documents are approved by the Buyer and thereafter shall supersede any contrary provisions in the Statement of Work attached to this Agreement as an exhibit.

C. Seller shall commence, carry on and complete its obligations under this Agreement with all deliberate speed in accordance with the dates set forth in the Project Schedule and in a sound, economical and efficient manner, in accordance with this Agreement and all applicable laws. In providing services under this Agreement, Seller agrees to cooperate with the various departments, agencies, employees and officers of Buyer.

D. Seller agrees to secure at Seller's own expense all personnel necessary to carry out Seller's obligations under this Agreement. Such personnel shall not be deemed to be employees of Buyer nor shall they have or be deemed to have any direct contractual relationship with Buyer. Seller expressly understands and agrees that the Seller is and shall in all respects be considered an independent contractor.

SECTION 3. PROJECT MANAGEMENT AND PLANNING:

A. **Project Managers.** Seller shall designate a Project Manager who will lead the Seller' team for the System installation project and other Services and Work described in this Agreement (the "Project") and will serve as the Buyer's primary point-of-contact for Seller's project team and the official liaison between Seller's project team and Buyer. Buyer shall designate a Project Manager to function as the primary point-of-contact and official liaison between Seller's Project Manager and the Buyer.

B. **Project Completion Dates.** The Project completion dates are described in the schedule included in the Statement of Work, entitled "Project Schedule." The Project Schedule may only be modified by mutual written approval of the Parties or as otherwise provided in this Agreement.

C. **Project Kick-off Meeting.** Promptly after the Effective Date of the Agreement, the Seller's Project Manager shall schedule a Project Kick-Off Meeting, the timing and location of which will be mutually agreed upon by Seller and Buyer. The objectives of this meeting include introduction of all project participants, review of the roles of the project participants, review of the overall project scope and objectives, review of the resource and scheduling requirements and review of current site status.

D. **Site Visits.** All existing towers, shelters and associated equipment provided by or mandated by Buyer shall be satisfactory in all manners to accommodate the System proposed by the Seller. Following the Effective Date of the Agreement, the Buyer shall provide Seller with access to all Project Sites upon reasonable notice to allow Seller and additional team members designated by the Buyer to thoroughly examine each Site and to perform the Detailed Design Review, to prepare a schedule of preparatory work required for each site and a timeline for completion of the preparatory work at each site.

E. **Construction Management Services, Site Preparatory Work.** Seller shall perform the civil construction services set forth in the Statement of Work and the Responsibility Matrix including, but not limited to, the site improvement civil construction to be performed at the identified sites. After

execution of this Agreement, Seller shall identify and disclose to Buyer any and all problems or conditions at all Project Sites identified during the site visits of which Seller is aware that may affect the Work to be performed by Seller under this Agreement.

F. **Detailed Design Review.** The Detailed Design Review ("DDR") phase will commence after the Effective Date of the Agreement, and conclude at a mutually acceptable time to maintain adherence to the Project Schedule. During the DDR, Seller's Project Manager and project team will meet with Buyer's project team on one or multiple occasions to review the System design, technical data, and site specific information to confirm and to refine the System and Tower Sites. At the conclusion of the DDR, Seller will provide Buyer with the following documents (the "Detailed Design Documents") for review and approval by Buyer:

- Final Siting Plans
- Project Schedule
- Final pricing for site civil construction and microwave infrastructure
- Final pricing for Project Management services
- Engineered Site plans (sufficient for the Buyer to obtain required zoning approvals) and construction drawings for each site.
- Shelter Floor Plan Drawings
- Rack Elevation Drawings
- System Block and Level Diagrams
- Power and HVAC Loads
- Antenna Network Diagrams
- Site Frequency Plans (including spectrum analysis and intermodulation studies of existing and proposed frequencies at each site).
- TX Combiner Plan by Site
- Network Backhaul Plans
- Radio Frequency plans
- Cutover plan
- Staging Acceptance Test Plan (SATP)
- Coverage Acceptance Test Plan (CATP)
- Final Acceptance Test Plan (FATP)
- Equipment list
- Location of demarcation points for any items to be provided by the Buyer
- Site installation drawings, including room layouts, all cable runs, and grounding
- Antenna drawings including antenna placement on tower and coaxial cable loading information, antenna center line heights, and any other equipment mounted on the tower on a site by site basis
- Tower structural analysis results for towers passing analysis

- Structural analysis detailing required tower modifications for any towers that fail analysis
- Any other documents as mutually agreed upon by the parties.

Buyer shall have Twenty business (20) days to conduct its review of the above documents. Approval of Detailed Design Documents by the Buyer shall not be unreasonably withheld, conditioned or delayed.

G. **Project Schedule.** The Project Schedule for the Work is included in the Statement of Work, as an attachment entitled "Project Schedule." Updates to the start dates and durations will be made as the information evolves and will be mutually agreed upon by both parties or updated as otherwise provided herein.

H. **System Implementation Communications.** Seller and Buyer shall jointly establish a plan that defines regular meetings, reporting structure, and other communications activities, including working sessions that may be needed throughout the term of this Agreement to plan sub-tasks, including at a minimum: (a) one or more DDR meetings to communicate the final engineering design; (b) formal monthly reports to Buyer's Project Manager concerning work in progress and accomplishments; (c) weekly status meetings at which the parties' Project Managers and other project participants will provide updates; (d) conference calls with Seller's and Buyer's project teams to discuss tasks, assign responsibility, and establish schedules; and (e) workshops or working sessions that may be needed throughout the Project to plan subtasks.

I. **Buyer Approvals**. Buyer will acknowledge receipt of and review and respond with reasonable promptness to all submittals or other items requiring its approval under this Agreement. For all such submittals or other items Buyer will provide the Seller with either; (i) written notification of Buyer's approval, or (ii) a written notification of conditional approval subject to Seller providing prompt correction of any noted deficiency, or (iii) in the case of a submittal that does not meet the requirements of the Agreement, a written notification of Buyer's disapproval. Buyer's disapproval notification will be provided with reasonable detail to sufficiently advise Seller of the basis on which the submittal was determined to be unacceptable. Buyer agrees that, except as otherwise provided, failure to provide approval, conditional approval or non-approval of a submittal for which its approval is required within fifteen (15) business days of acknowledgement of receipt of the submittal from the Seller may result in a delay to the Project and that Seller may take any action allowed under this Agreement including but not limited to a Change Order as defined under this Agreement for such delays. Seller understands and agrees that Buyer is a political subdivision governed by a Board of Commissioners who may be required to approve certain submittals, and that the process for doing so may take several weeks or more. For all such submittals the Parties hereto agree Buyer shall use reasonable efforts to present any such submittals to the Board of Commissioners for their review and possible approval in such manner as to avoid delays to the Project. The parties agree that this section, Project Management and Planning, does not relate to the Testing and Acceptance procedures in the Testing and Acceptance section of this Agreement.

SECTION 4. OBLIGATIONS FOR SYSTEM IMPLEMENTATION:

The following subsections apply to the Work to be performed under the Agreement.

A. **Project Management and Implementation Plan.** Buyer and Seller each agree to perform their respective tasks and obligations pertaining to permits and licenses, Project Site surveys, general Project Site-related responsibilities, general Hardware-related responsibilities, and Project Site-specific

responsibilities as set forth in the Statement of Work. The Buyer's obligations set forth in the Statement of Work shall be performed by Buyer in a timely and proper fashion in accordance with the Project Schedule, or as otherwise agreed upon by Buyer and Seller, to allow Seller to timely perform its obligations under the Agreement.

B. **Access.** Buyer shall provide access, at no cost to Seller, to all owned, leased, or licensed Project Sites at reasonable times, and with an escort (if required) at no charge, upon reasonable prior notification from Seller. Buyer shall ensure sufficient room, within reason, for construction vehicles used by Seller. Seller shall identify any concerns with access to the Project Sites at the time of the DDR. After DDR any new concerns that were not present at the time of the DDR will be raised to the Buyer at the time any new concern is known. Buyer shall issue temporary identification cards to Seller's personnel and its authorized subcontractors, if required, for access to any of the Project Sites.

C. **Changes in Sites.** Any sites where Seller will operate and perform System installation under the terms of this Contract must be approved by Buyer, which approval shall not be unreasonably withheld, delayed or conditioned. Should Buyer direct an addition to, removal from, or modification of the list of sites as detailed in this Agreement that affects Seller's cost or schedule or System performance, including, but not limited to coverage, the parties agree that such change shall entitle Seller to a Change Order and each Party shall attempt, in good faith to fully negotiate and execute such Change Order prior to commencement of the Work at the changed site.

D. **Preparatory Work on Sites.** Notwithstanding anything to the contrary contained in this Agreement, the parties agree that some Project Sites may require tower replacement or modifications, as well as related permitting and licensing for Work and/or obtaining physical real estate space. As stated in the Responsibility Matrix, Buyer shall be responsible for securing all necessary site zoning, site access, or other permits (including but not limited to easements, impact studies, planning commission approval, variances, etc.) necessary for the Work, whether required by federal, state, or local authorities, with Seller assisting by providing information and any required civil engineering drawings. Buyer shall also have the responsibility to secure by lease, purchase, easement or otherwise all rights and access to selected sites or additional real estate as may be required. Buyer also shall be responsible for paying all utility charges to the appropriate utility for providing utility services to the System installation areas. The Parties agree to mitigate the need for tower replacement or modification to the extent practical. If any unanticipated tower replacements become necessary, Seller is entitled to an extension of time for any impacted activities and/or an equitable adjustment to the Contract Price to maintain the Project Schedule.

E. **Frequency FCC Licensing.** The Buyer will be responsible for obtaining all Federal Communications Commission frequency licenses for the System, with Seller providing technical assistance and information as set forth in the Statement of Work. Seller shall provide the Buyer with a recommended frequency plan for the system with sufficient time as agreed with the Buyer to process request to acquire or purchase and license any frequency needed with the appropriate authorities. Seller has no responsibility or obligation to secure licensed frequencies. In the event Buyer fails to obtain FCC licenses, and such failure has a material impact on the cost of Work performed by Seller under the Agreement and/or the schedule, the parties agree that Seller shall be entitled to an equitable adjustment to the Project Schedule, the Total Agreement Price, or both and that a Change Order shall be agreed to by the parties.

F. **Federal Aviation Administration (FAA) Approvals.** Buyer will be responsible for obtaining all FAA approvals for newly-constructed or modified towers with Seller providing technical assistance and information as set forth in the Statement of Work.

G. **Contractor Licenses**. Seller will be responsible for obtaining all contractor licenses required for the performance of its duties and obligations.

H. **Prevailing Wages**. Pursuant to NRS 338.020, every contract over $250,000 (for Redevelopment Projects the contract amount is $100,000) to which a public body is a party and that requires the employment of skilled or unskilled labor in the performance of a public work must contain in expressed terms the rate of wages to be paid to each of the classes of workmen. The rate of wages must not be less than the rate of such wages then prevailing in the county in which the public work is located. Unlike prevailing wage requirements under Federal law (Davis-Bacon) and requirements in many states that surround Nevada, Nevada's prevailing wage requirements may be met by providing a combination of wages and permissible benefits to the mechanic or workman. Prevailing wage rates and amendments are posted on the Labor Commissioner's website www.labor.nv.gov

I. **Vietnam Veterans**. The SELLER agrees to comply with Section 402-Affirmative Action for Disabled Veterans and Veterans of the Vietnam Era Act.

J. **Equal Employment Opportunity**. The SELLER will not discriminate against any employee or applicant for employment or individual receiving the benefit of SELLER services because of race, creed, religion, color, age, national origin, political affiliation, sex, sexual orientation, familial status, or disability (as provided in Section 504 of the Rehabilitation Act of 1973, as amended). SELLER will take action to ensure that all applicants are considered equally. Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination, rates of pay or other forms of compensation; and selection for training, including apprenticeship. The SELLER agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the provisions of this non-discrimination clause. Such action shall include individuals benefiting from program services/activities.

K. **Americans with Disabilities Act.** The SELLER agrees to comply with any federal regulations issued pursuant to the Americans with Disabilities Act (ADA) and Section 504 of the Rehabilitation Act of 1973, as amended.

L. **Hatch Act.** Neither SELLER program nor the funds provided therefore, nor the personnel employed in the administration of the program shall be in any way or to any extent engaged in the conduct of political activities in contravention of Chapter 15 of Title 5, United States Code.

M. **Byrd Anti-Lobbying Amendment.** The SELLER agrees to conform to the regarding Influence/Lobbying Requirements as set forth in the Byrd Anti-Lobbying Amendment 31 U.S.C. 1352.

N. **Clean Air Act.** The SELLER agrees to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act 42 U.S.C. 7401-7671 q and the federal Water Pollution Control Act as amended 33 U.S.C. 1251-1387.

O. Drug-Free Workplace Requirements. SELLER agrees to conform to the guidelines set forth in the certification regarding Drug-Free Workplace Requirements. SELLER certifies that it will provide a drug-free workplace by:

a) Publishing a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession or use of a controlled substance is prohibited in the grantee's workplace and specifying the actions that will be taken against employees for violation of such prohibition;

b) Establishing a drug-free awareness program to inform employees about:

1. The dangers of drug abuse in the workplace;
2. The grantee's policy of maintaining a drug-free workplace;
3. Any available drug counseling, rehabilitation, and employee assistance programs; and
4. The penalties that may be imposed upon employees for drug abuse violations occurring in the workplace;

c) Making it a requirement that each employee to be engaged in the performance of the grant be given a copy of the statement required by paragraph (1);

d) Notifying the employee in the statement required by paragraph (1) that, as a condition of employment under the grant, the employee will:

1. Abide by the terms of the statement; and
2. Notify the employer of any criminal drug statute conviction for a violation occurring in the workplace no later than five days after such conviction;

e) Notifying the agency within ten days after receiving notice under subparagraph (4) (b) from an employee or otherwise receiving actual notice of such convictions;

f) Taking one of the following actions, within 30 days of receiving notice under subparagraph (4) (b), with respect to any employee who is so convicted;

1. Taking appropriate personnel action against such employee, up to and including termination; or
2. Requiring such employee to participate satisfactorily in a drug abuse assistance or rehabilitation program approved for such purposes by a Federal, State, or local health, law enforcement, or other appropriate agency;

g) Making a good faith effo1t to continue to maintain a drug-free workplace through implementation of paragraphs (a), (b), (c), (d), (e) and (f).

P. Debarment, Suspension and Other Responsibility Matters. SELLER certifies to the best of its knowledge and belief that it and its principals:

1. Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;
2. Have not, within a three year period preceding this Agreement, been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;
3. Are not presently indicted for or otherwise criminally or civilly charged by a government entity (Federal, State, or local) with commission or any other offenses enumerated in (b) above;
4. Have not, within a three-year period preceding this Agreement, had one or more public transactions (Federal, State, or local) terminated for cause or default; and
5. Understands that a false statement on this certification may be grounds for rejection or termination of this Agreement. In addition, under 18 USC Sec. 1001, a false statement may result in a fine of up to $10,000 or imprisonment for up to 5 years, or both.

SECTION 5. DELIVERY, TITLE AND RISK OF LOSS:

A. **Infrastructure Hardware**. Seller shall ship the Infrastructure Hardware at Buyer's expense on or before the dates set forth in the Project Schedule. Buyer shall approve shipment to Buyer's secured facility before Seller ships. Seller will give Buyer three (3) business days-notice before shipment. Partial deliveries shall be permitted. Upon receipt of the equipment by the Buyer, title to each portion of the Hardware and all risk of loss or damage shall pass to Buyer. Infrastructure Hardware may be shipped directly to Buyer or to a mutually agreed upon staging or storage location. Upon transfer of title from Seller to Buyer, Buyer shall keep the Hardware fully insured.

B. **Terminal Hardware**. Seller shall ship the Terminal Hardware to Buyer at Buyer's expense. Seller shall only ship Terminal Hardware to Buyer at Buyer's request. Seller will give Buyer three (3)

business days-notice before shipment. Partial deliveries shall be permitted. Upon receipt of the Terminal Hardware by the Buyer, title to each portion of the Hardware and all risk of loss or damage shall pass to Buyer.

C. Regardless of whether title has passed to Buyer, Seller is responsible for any damage to any Infrastructure or Terminal Hardware which is caused by any employee, agent, subcontractor, or other person or entity employed by Seller during installation and testing of such Hardware, from the time Seller takes physical control of the Hardware to final acceptance of System by Buyer.

SECTION 6. PRICE:

A. The Total Agreement Price is the sum of the Infrastructure Hardware Price (Section 6.A.1), additional funds established for but not limited to Project Site Civil Infrastructure and Microwave Infrastructure (Section 6.A.2), and the total price of all Terminal Hardware (Section 6.A.3). The individual prices for the units of Hardware, the Software license and the Services to be performed are as set forth in the Price Schedule as an attachment to the Statement of Work. Buyer and Seller recognize that the pricing under his Agreement is dependent upon a volume discount based on the amount of Terminal and Infrastructure Hardware purchased by Buyer. In the event that the Buyer does not purchase the total Terminal and Infrastructure Hardware under this Agreement as represented in Exhibit 5 Equipment List and Exhibit 6 Price Schedule, Buyer agrees Seller shall be entitled to an equitable adjustment by Change Order to the Total Agreement Price in accordance with the following table:

Radio Quantity	Reduction of Add'l Discount/Price Increase
4,000 +	$0
3,000 – 3,999	$210,000
2,000 – 2,999	$525,000
1,000 – 1,999	$850,000
No Radios	$3,500,000

B. The Total Agreement Price to be paid by Buyer to Seller is Nineteen million, five hundred four thousand, two hundred eighty-seven and 28/100 United States Dollars ($19,504,287.28). The individual prices for the units of Hardware, the Software license and the Services to be performed are as set forth in the Price Schedule as an attachment to the Statement of Work. Payments for the Infrastructure Hardware Price are addressed in Section 9.A.1.

1. The mutually agreed upon Seller radio system equipment pricing amounts have been priced on a commercial, firm-fixed price basis and are set forth in the table below and in the Total NSRS Price Summary, Table B.1 in Exhibit 6 to the Statement of Work. The total amount of the following categories of Seller radio system equipment listed in the table below ($8,543699.93) will be billed in accordance with the contract milestone payments listed in Section 9 PAYMENTS, Subsection 4. The pricing amounts do not include any sales and use taxes. Applicable sales and use taxes, if any, will be included on invoices and payable by buyer.

Radio System Equipment Pricing Amounts	
Washoe Discount Base Price	$4,577,482.72
Washoe County Greenfield Sites Price	2,675,477.68
Washoe County Dispatch Equipment and Services	583,647.53

Washoe Extended Warranty Support	707,092.00
Total	$8,543,699.93

2. Due to the scope and nature of the Agreement, additional funds have been established to address Seller services, including but not limited to Project Site Civil Infrastructure and Microwave Infrastructure, that may be required to complete the project scope of work. The scope of services requiring the use of these additional funds will be agreed upon in writing by the Parties in a Change Order to this Agreement prior to the commencement of such services. The cost of services will also be negotiated prior to performing the services and will include all costs associated with the work. The total costs of the work for the additional funds for this Agreement shall not exceed the of Seven million, thirty-three thousand, two hundred twenty-three_ and 40/100 Dollars ($7,033,223.40) unless such sum is increased through a written amendment to this Agreement. Services to be performed by the Seller shall not commence until its receipt of written approval from the Buyer.

3. Pricing for Terminal Hardware is specified on a per unit basis in Exhibit 6. Payments for Terminal Hardware equipment are addressed in Section 9.A.3.

4. The Seller's mark up on subcontractor performed work shall not be more than twenty-five percent (25%) of the total of the attached subcontractor invoice amounts for material and thirty-two (32%) of the total of the attached subcontractor invoice amounts for services. The definition of "third party materials" does not include any vendor materials listed in the Harris Price Catalog pages ("Vendor Materials"). Any Vendor Materials sold by Seller to Buyer which are not otherwise listed with a unit price in the pricing schedule pages in this Agreement, will be sold at the price listed in the Harris Price Catalog less a Twenty-Six Percent (26%) discount. Seller will provide a copy of the applicable Harris Price Catalog page as substantiation for the price of any Vendor Materials.

5. Terminal Hardware Pricing after extended warranty period:

Terminal Hardware Pricing Discount Post Warranty	
• Discount per PO Quantity	
Tier Quantity	**Discount off List**
4,000+	70%
3,000-3,999	65%
2,000-2,999	60%
1,000-1,999	55%
1-999	48%

SECTION 7. TAXES:

In addition to any price specified herein, Buyer shall pay the gross amount of any present or future sales, use, excise, value-added, or other similar tax applicable to the price, sale or any Products or services furnished hereunder or to their use by Seller or Buyer, or Buyer shall otherwise furnish Seller with tax exemption certificates acceptable to all applicable taxing authorities.

SECTION 8. CHANGES AND ADDITIONS:

A. **Hardware Changes**. In the event of any change in the Hardware as a result of the imposition after the Effective Date of this Agreement of any requirements by any federal, state, or local government, Seller

shall be entitled to an equitable adjustment, by Change Order, in the Total Agreement Price, the Project Schedule, or both. Any such adjustment in the Total Agreement Price or Project Schedule shall be mutually satisfactory to Buyer and Seller. Price increases and/or extensions of time shall not be binding upon either Party unless and until evidenced by a Change Order signed by the parties hereto.

B. **Buyer Requested Changes.** Buyer may request changes in or additions to the Work or in the time or place of performance of the Work under this Agreement. If any such change causes an increase or decrease in the cost of, or the time required for, performance of any part of the Work under this Agreement, Buyer or Seller, as applicable, shall be entitled to an equitable adjustment, by Change Order, in the Total Agreement Price, the Project Schedule, or both. Any such adjustment in the Total Agreement Price or Project Schedule shall be mutually satisfactory to Buyer and Seller. Price increases and/or extensions of time shall not be binding upon either Party unless and until evidenced by a Change Order signed by the parties hereto.

C. **Buyer Delays In Performance.** To the extent that Buyer fails to timely perform its obligations under the Responsibility Matrix or otherwise under this Agreement, and such failure has a material impact on the cost of Work performed by Seller under the Agreement and/or the schedule, the parties agree that Seller shall be entitled to an equitable adjustment to the Project Schedule, the Total Agreement Price, or both. Any such adjustment in the Total Agreement Price or Project Schedule shall be mutually satisfactory to Buyer and Seller. Price increases and/or extensions of time shall not be binding upon either Party unless and until evidenced by a Change Order signed by the parties hereto.

D. **Concealed Conditions.** If, following Buyer's Acceptance of the Detailed Design Documents, Seller encounters a concealed condition, of which it had no reason to be aware, at one or more Project Sites, then the Parties agree to work together to determine the best course of action and agree to negotiate in good faith a Change Order and an equitable adjustment to the Project Schedule and/or Total Agreement Price. Any such adjustment in the Total Agreement Price or Project Schedule shall be mutually satisfactory to Buyer and Seller. Price increases and/or extensions of time shall not be binding upon either Party unless and until evidenced by a Change Order signed by the parties hereto.

E. **Product Discontinuance**. Subject to its obligation to fulfill its obligations set forth in the Agreement, Seller reserves the right to change or to discontinue any product covered by the Agreement provided that Seller agrees to make available to the Buyer a functionally equivalent replacement product equal to or better than the product discontinued.

F. **Frequency Support and Frequency Changes.** Seller shall reasonably support Buyer in submitting the Buyer's frequency licensing applications to the Regional authorities and the Federal Communications Commission for this project. In the event that, after all commercially reasonable efforts and due diligence have been expended, the Buyer cannot obtain all of the necessary United States and Canada government approvals for the frequency plan as described in this Statement of Work and this Agreement, it shall be treated as an excusable delay event pursuant to the Excusable Delays section of this agreement for which an extension to the Project Schedule shall be granted, and Seller will diligently and expeditiously prepare and provide to Buyer a System re-design for its review and approval including all price and schedule changes. Notwithstanding anything to the contrary contained in the Agreement, the Parties agree if a System re-design has a material impact on the cost of Work performed by Seller under the Agreement and/or the schedule, the parties agree that that Seller may be entitled to an equitable adjustment to the Total Agreement Price and/or the Project Schedule for Seller's services on any such System re-design. Any such adjustment in the Total Agreement Price or Project Schedule shall be mutually satisfactory to Buyer and Seller. Price increases and/or extensions of time shall not be binding upon either Party unless and until evidenced by a Change Order signed by

the parties hereto. In the event that Buyer and Seller cannot mutually agree on the System re-design, either party may then terminate the Agreement on thirty (30) days written notice to the other Party.

SECTION 9. PAYMENTS:

A. The Total Agreement Price for the Hardware, the Software license and the Services shall be paid by the Buyer to Seller following the pricing schedules below (Section 9, A.1 – A.3). The Seller shall submit a signed invoice in accordance with the pricing schedule for all services rendered along with one copy of documentation validating that work associated with the invoice has been completed. Invoices must be submitted on the Seller's stationary or on the Buyer's standard invoice form.

1. **Infrastructure Hardware.** Costs for Infrastructure Hardware are to be paid for by Buyer upon completion of the milestones specified in the project schedule, Exhibit 4, and as hereto specified.

   i. Six and a one quarter percent (6.25%) of the Total Agreement Price (excluding the aggregate price of the Terminal Hardware included in the Total Agreement Price shall be due at the time of the signing of the Agreement by the Buyer and Seller.

   ii. Twelve (12%) of the Total Agreement Price (excluding the aggregate price of the Terminal Hardware included in the Total Agreement Price) shall be due at the time of signed approval of the final Detailed Design Review.

   iii. Ten percent (10%) of the Infrastructure Hardware Price (excluding the aggregate price of the Terminal Hardware included in the Total Agreement Price) shall be due at the time that the full Network Switching Center (NSC) Installation is commences.

   iv. Fifteen percent (15%) of the Total Agreement Price (excluding the aggregate price of the Terminal Hardware included in the Total Agreement Price) shall be due at the time that the full Network Switching Center (NSC) Installation is complete.

   v. Fifteen percent (15%) of the Total Agreement Price (excluding the aggregate price of the Terminal Hardware included in the Total Agreement Price) shall be due at the time of approval of Region two (2) Infrastructure Hardware factory staging as described in the project schedule.

   vi. Twenty percent (20%) of the Total Agreement Price (excluding the aggregate price of the Terminal Hardware included in the Total Agreement Price) shall be due at the time of Region two (2) Infrastructure Hardware shipment and delivery to Buyer. Partial payments of the total Infrastructure Hardware amount due under this subparagraph shall be allowed and shall be calculated using the value of the Infrastructure Hardware shipped and delivered as a percentage of the total value of the Infrastructure Hardware to be shipped and delivered under the terms of this Agreement. The Buyer shall have the right to inspect and confirm that the Infrastructure Hardware included in Seller's invoice has been delivered to Buyer

   vii. Fifteen percent (15%) of the Total Agreement Price (excluding the aggregate price of the Terminal Hardware included in the Total Agreement Price) shall be due upon completion and Buyer approval of the Buyer portion of Region Two (2) Hardware installation (exclusive of the mutually agreed upon value of any punch list items).

   viii. Six and three quarters percent (6.75%) of the Total Agreement Price (excluding the aggregate price of the Terminal Hardware included in the Total Agreement Price) plus any remaining unpaid portion of the Total Agreement Price for all Hardware, Software and Services to be provided under the terms of this Agreement (excluding the aggregate

price of the Terminal Hardware included in the Total Agreement Price) shall be due upon Final System Acceptance (including resolution of all punch list items).

2. Site Civil Construction and Microwave Infrastructure Hardware and Services

Payment in full at shipment of equipment and payment monthly on services, shall be due for civils related work.

1. Seller shall submit signed invoices for Site Civil and Microwave Infrastructure hardware and services based on pricing specified in the Final Detailed Design. Invoices Shall be submitted when Site Civil or Microwave Infrastructure at one or more sites is complete.

2. Invoices submitted for Site Civil and Microwave Infrastructure hardware and services shall be accompanied by substantial documentation indicating work has been completed.
    a. If Seller's subcontractor performed work, subcontractor's invoice to Seller shall be included as part of invoice documentation.

3. At completion of 100% of the site civil construction and microwave equipment, software, and licensing installation, including all punch list items, 100% of the cost detailed in the Final Detailed Design for site civil construction and microwave equipment, software, and licensing shall be paid by Buyer to Seller.

3. Terminal Hardware:

One Hundred Percent (100%) of the purchase price of Terminal Hardware shall be invoiced upon Buyer's approval of shipment of units on a per unit basis.

4. Radio System Equipment Milestone Payments

Milestone Payment	%	Milestone Payment Amount
1. Contract Mobilization due at Contract Signing	6.25%	$533,981.25
2. Customer Approval of Detailed Design Review	12%	$1,025,244.00
3. Installation of NSC Initiated	10%	$854,370.00
3. Installation of the NSC Complete	15%	$1,281,555.00
4. Factory Staging approved	15%	$1,281,555.00
5. Equipment Shipment	20%	$1,708,740.00
6. Approval of Equipment Installation	15%	$1,281,555.00
7. Final System Acceptance	6.75%	$576,699.68
Service Provider Radio System Equipment Billing Total	**100%**	**$8,543, 699.93**
Civils by Site		$7,033,223.40
Terminal Hardware Payments: Washoe Subscriber Equipment (Terminals) and Programming Services amounts will be invoiced upon shipment of the Terminal units on a		

per unit basis at the unit prices set forth in the pricing pages less the Radio Volume Discount percentage listed in Table B.1, Price Summary**.** Shipment schedule will be determined by customer.		

B. Buyer reserves the right to inspect and approve all work or deliverables performed by Seller under this Agreement before payment is made to the Seller. Payment will be withheld if Buyer determines any work or deliverables to be unsatisfactory in that they have not been provided in a workmanlike manner consistent with standards in the trade, profession, or industry. Payment shall remain unpaid until the professional services are completed in accordance with the standards and work requirements defined in this Agreement. In such an event, Buyer will provide the Seller with a written explanation as to why payment has been withheld.

C. **Payment of invoices**

1. The Seller shall be paid within thirty (30) calendar days of a received invoice which is complete, correct and undisputed by Buyer.
2. Buyer shall have twenty (20) calendar days after receipt of an invoice to dispute any or all of the charges on that invoice. The undisputed amount shall be paid to the Seller within thirty (30) calendar days of receipt of an invoice. The disputed amount shall be negotiated and resolved in good faith by both Parties and paid within thirty ((30) calendar days after the date the corrected invoice is received by Buyer or is approved by both Parties for payment.

D. **Other Amounts** Any other amounts due Seller hereunder shall be due sixty (60) days following Buyer's stamped received date of Seller's proper invoice.

SECTION 10. SUBCONTRACTING:

Seller may subcontract any portion of Work to be performed by Seller hereunder and shall obtain prior approval and consent of Buyer, provided that Seller shall be responsible for the performance and Work of any such subcontractors.

Seller understands and agrees that Buyer is subject to an Interlocal Agreement which describes the operations of its portion of the radio system among the parties to that Interlocal Agreement. To build and implement the System as described herein Seller will require access to the Interlocal members' properties which include secure facilities such as police stations and jails. Seller is aware and agrees that those members have the right to require independent background checks performed by another entity. Buyer will use its best efforts in advance of any such need to obtain agreement from the members to accept the background checks performed by Seller and Seller will provide Buyer with the information requested by members to obtain that agreement. The Parties will work together to avoid delays and any impact on the critical path.

Background Checks

Access to Buyer controlled areas is granted on an as-needed basis only in accordance with Seller's internal badge and access policies. Buyer shall specify in the Release or Scope of Work whether or not the Work under this Contract requires either: (i) unescorted physical access to Buyer's Facilities;

or (ii) local or remote access to Buyer's Cyber Assets. For all Personnel who require either such access, Seller shall:

a. Conduct, at Seller's cost and expense, a Personnel risk assessment to include at a minimum an identity verification and seven (7) year criminal background check for the current residence and past locations of residence of all Personnel requiring access. All background checks will be conducted in accordance with federal, state, provincial and local laws, and subject to existing collective bargaining unit agreements or other agreements, if any. A background check completed within two (2) years prior to the date the Seller signed a Seller/Vendor Information Form for each such person will be considered valid. Following the initial background check, updates shall be performed no less frequently than every seven (7) years or upon request by Buyer. In the event Buyer notifies Seller of impending expiration of a background check, Seller shall provide an updated Seller/Vendor Information Form reflecting a refreshed background check within twenty (20) days of receipt of the Notice in order to avoid revocation of such person's access. An appropriate authorization form must be signed by each of the Personnel prior to a background check being conducted, acknowledging that the background check is being conducted and authorizing the information obtained to be provided to Buyer;

b. Ensure that Personnel have passed the background checks outlined in this subsection prior to requesting access to Buyer's Facilities and/or Cyber Assets. In the event any such person: (i) is currently under indictment for a crime punishable by imprisonment for a term exceeding one (1) year; (ii) has been convicted (within the past seven (7) years) in any court of a crime punishable by imprisonment for a term exceeding one (1) year; (iii) is currently a fugitive of justice; or (iv) is an alien illegally or unlawfully in the United States, such person shall be considered a "restricted person" and may not be granted access without prior written consent from Buyer. In the event any such person's background check reveals any residency gap of six (6) consecutive months or more, Seller shall review, evaluate, and document any such residency gap to ensure that it does not pose a risk to Buyer's Facilities or Cyber Assets, prior to making a determination that Personnel have passed the background check;

c. Ensure that Personnel complete Buyer provided or approved training prior to requesting access;

d. Ensure that Personnel have passed Seller's drug and alcohol exam and are in compliance with Seller's substance abuse/drug and alcohol policy; and

e. Keep accurate and detailed documentation to confirm completion dates for background checks and all required training (initial and annual training, to the extent applicable), and certify to Buyer such documentation by completing an information form containing a complete record of the completed background checks for each person who will have access. Buyer has the right to audit Seller's records supporting each Seller/Vendor Information Form submitted to Seller and to verify that the requisite background checks and training were performed. Seller shall provide Buyer with all requested records supporting Seller/Vendor Information forms within a reasonable time after receiving such a request, and in the form requested by Buyer, but not longer than three (3) business days following the date of such request.

f. Notify the Buyer in a timely manner of termination or change in status removing the need for access. In the case of Sensitive Personnel and/or involuntary termination, notification must

be immediate. In all other cases, notification must be within one business day.

g. Seller shall not allow any person who has not met the foregoing requirements of this subsection to perform Work, unless Seller has received prior written consent from Buyer.

SECTION 11. EXCUSABLE DELAYS:

A. Seller shall not be liable for reasonable delays in delivery or failure to perform due directly or indirectly to: (1) causes beyond Seller's reasonable control, (2) Acts of God, acts (including failure to act) of any governmental authority (de jure or de facto), wars (declared or undeclared), riots, revolutions, strikes or other labor disputes, fires, floods, sabotage, nuclear incidents, earthquakes, storms, epidemics, (3) Seller's inability to timely obtain necessary materials, items, components or services from suppliers who are affected by the foregoing circumstances, or (4) Buyer Delays in Performance of its obligations hereunder in a timely manner. The foregoing shall apply even though any of such causes exists at the time of signature of the Agreement by Seller or occurs after delays in Seller's performance of its obligations due to other reasons.

B. In the event of any delay or failure excused by this Section Excusable Delays, Seller shall as soon as practical notify Buyer and shall at the same time, or at the earliest practical date after such notice, specify the revised delivery and performance dates. In the event of such delay, the time of delivery or of performance shall be extended for a reasonable time period to compensate for the time lost by Seller by reason of the delay.

SECTION 12. SELLER'S INSURANCE AND PERFORMANCE BOND:

A. Buyer has established specific indemnification and insurance requirements for contracts/agreements with contractors/consultants to help ensure that reasonable insurance coverage is maintained. Indemnification and hold harmless clauses are intended to ensure that contractors/consultants are aware of and accept the responsibility for losses or liabilities related to their activities. Exhibit D is attached and included by reference. All conditions and requirements identified in this Exhibit shall be completed prior to the commencement of any work under this contract/agreement.

B. The parties do hereby expressly agree that Buyer, acting at its sole option and through its Risk Manager, may waive any and all requirements contained in this section Seller's Insurance, such waiver to be in writing only. Such waiver may include or be limited to a reduction in the amount of coverage required above. The extent of waiver shall be determined solely by Buyer's Risk Manager taking into account the nature of the Work and other factors relevant to Buyer's exposure, if any, under this Agreement.

C. Within ten (10) business days of execution of this Agreement, Seller shall provide Buyer with a surety bond for performance substantially in the form set forth in attachment to this Agreement, which bond shall terminate upon final System Acceptance as set forth in subsection A above.

SECTION 13. TESTING AND ACCEPTANCE:

A. **NSRS Regional Implementation**: An NSRS Region means those 3 divisions as defined in Figure 1 – NSRS Regional Map, contained in Exhibit 10 - Statement of Work- Project Implementation Plan

("NSRS Region"). Each NSRS Region will be implemented simultaneously for each NSRS Member. Buyer and Seller agree that the Project will begin by performing the System Implementation project tasks on an NSRS Region by NSRS Region Basis at the direction of the NSRS Members. The Infrastructure Hardware and associated Software for each NSRS Region shall meet the requirements for the Factory Testing Phase defined below prior to the shipment of the hardware. Buyer, other NSRS Members and Seller will have developed and agreed upon an Acceptance Testing Plan for each NSRS Region by the end of the Detailed Design phase of the Project.

B. **The Factory Testing Phase**: For each NSRS Region, the Factory Testing Phase, NSRS Members and Seller shall approve a Factory Acceptance Test Plan ("FATP"), which shall include visual inspections, verification of electrical parameters of the Hardware and associated Software, functional tests, system resiliency and other aspects of the Hardware and associated Software or systems, conducted in accordance with standards of good engineering practice and including such other quality control and product approval procedures as the manufacturer normally conducts on such Hardware and associated Software, to determine whether the Hardware and associated Software meets its Specifications according to the FATP. For each NSRS Region, the Factory Test Phase shall be conducted by Seller with NSRS Members observing on Hardware it manufactures in addition to third party products in the design. Such processes and results of such tests shall be documented and the documentation for each piece of Hardware and associated Software shall be provided to Buyer and NSRS Members within fourteen (14) business days of the date the Hardware is shipped to Nevada. The presentation of such documentation by Seller or Seller's supplier to Buyer shall constitute Seller's representation that the statements in the documents are true and correct, and that the factory testing according to the FATP and as observed by the NSRS Members for such Hardware and associated Software have been met. The shipment of Hardware for installation shall also constitute Seller's representation that the FATP for such Hardware and associated Software have been met. No Hardware shall be shipped or installed before it has met the FATP. NSRS Members and Seller shall jointly commence the Acceptance Tests on a mutually agreeable date and a representative of Seller and a representative of each NSRS Member shall sign off on the form provided as part of the test procedure whether each item of the test was passed or failed.

C. **Regional Acceptance Testing**: Seller shall notify Buyer and the other NSRS Members that an NSRS Region is ready for Acceptance Tests at least fifteen (15) business days before commencement of the Acceptance Tests. Acceptance Testing is defined as set out in the Functional Acceptance Test Procedures, SOW Exhibit 8, and the Coverage Character Test Procedures, SOW Exhibit 9, and shall include such other tests and procedures as Buyer or other NSRS Members may reasonably request during the development of the Acceptance Testing Plan during the Detailed Design Phase of the project. NSRS Members and Seller shall jointly commence the Acceptance Tests on a mutually agreeable date and a representative of Seller and a representative of each NSRS Member shall sign off on the form provided as part of the test procedure as to whether each item of the test was passed or failed. If the NSRS Region does not fulfill the requirements of the Acceptance Tests, and the failure is solely attributable to Seller's obligations under this Contract, Seller shall promptly correct the defects at no additional cost to Buyer and other NSRS Members as needed. Upon correction of the defects the Acceptance Tests for the applicable part of the NSRS Region shall be repeated in accordance with the procedures set forth in this Section and the Acceptance Testing Plan. Successful completion of the Acceptance Tests with all test having passed for an NSRS Region is the sole criterion for technical NSRS Regional Acceptance ("Regional Acceptance") and the initiation of the Warranty Period for the Infrastructure Hardware with respect to the NSRS Region. For avoidance of doubt, initially, the first NSRS Region will be implemented and tested. Next, the second NSRS Region will be implemented. During the testing of the second NSRS Implementation Region, the previously implemented NSRS region components that are common to both regions will be tested. Next, the third NSRS Region will

be implemented. During the testing of the third NSRS Implementation Region, the previously implemented components that are common to all regions will be tested.

D. **30-Day Operational Burn-in Phase**: The 30-Day Operational Burn-Test for each NSRS Region shall follow immediately after the successful completion of Regional Acceptance for each NSRS Region. During this time, representatives of Seller, Buyer and other NSRS Members shall observe the test procedure as defined in the Functional Acceptance Test Procedures in Exhibit 8 of the SOW. The 30-Day Operational Burn-in Phase will last for 30 consecutive days and shall be loaded with subscribers as agreed with the Member, but shall run anew in the event of a Major Failure as defined in the Acceptance Test Plan, with the 30-day clock restarting after Seller has corrected the cause of the Major failure, which Seller shall correct at Seller's expense.

E. **Final System Acceptance**: Final Acceptance for the NSRS shall occur when (i) Regional Acceptance has occurred for each NSRS Region including the 30-Day Operational Burn-In Test (ii) the Hardware and Software for the System, and Services have been furnished, delivered, installed and (iii) Seller has furnished Buyer with all document deliverables, and (iv) Seller and Buyer agree on a list of nonservice affecting defects in the appearance, operation or installation of the Hardware (the "Punch List") which Seller shall promptly resolve within and agreed reasonable timeframe.

F. **Preplanning Regional Acceptance Meeting**: When Buyer or any NSRS Member recognizes that they cannot meet a contractual obligation for performance under their respective Agreement with Seller, including but not limited to slippage in the Project Schedule, obligations under the Responsibility Matrix, or other material changes such that any region cannot be implemented per the Project Schedule, Seller and all NSRS Members shall meet to mutually agree on a Change Order. Such Change Order may affect the planned Coverage or other technical requirement for the NSRS region under implementation and may result in a modification to the Coverage Guarantee for that NSRS Region. The Change order shall ensure the continuation of the implementation of the NSRS Region in a timely manner so as not to delay the overall implementation for all NSRS Members.

G. Notwithstanding the acceptance testing of the NSRS Regions set forth in subsections C, and the exclusion of the shared Connect Cores as defined in Exhibit 10 - Statement of Work - Project Implementation Plan, if Buyer commences use of any portion of the System, in an NSRS Region for its intended purpose, other than for the express purpose of training, testing, or pre-acceptance site usages as mutually agreed upon by Seller and Buyer in writing, prior to Regional Acceptance of that NSRS Region, the applicable portion of the purchase price for that NSRS Region shall be due and payable and the NSRS Region will be deemed accepted. The Warranty Period for Infrastructure Hardware for the applicable portion of the System put into use together with the associated installation Services shall be deemed to have commenced concurrently with the use of the applicable portion of the System for its intended purpose. The use of the applicable portion of the System for its intended purpose shall be deemed to have occurred when Buyer commences to use and rely primarily on the applicable portion of the System for its communications.

H. **Pre-acceptance Site Usage**: Before Regional Acceptance has occurred in any Region, Buyer may begin using completed sites with written approval of Seller for Buyer defined pre-acceptance testing or non-critical communication needs during transitional period of implementation. Buyer acknowledges that before Regional Acceptance has occurred that the sites operating in such region are not fully operational as designed and that certain anomalies may occur including, but not limited to, occurrences of the following: dropped calls, unplanned system interruption, or variance in coverage from the guaranteed coverages in this Agreement. BUYER AGREES ONLY TO ALLOW NON-PUBLIC SAFETY USERS TO USE A SITE BEFORE REGIONAL ACCEPTANCE AND WILL NOT ALLOW PUBLIC SAFETY USERS OR FIRST RESPONDERS TO USE A SITE BEFORE

REGIONAL ACCEPTANCE AND WILL NOT ALLOW ANY USE BEFORE REGIONAL ACCEPTANCE REQUIRING FAIL-SAFE, EMERGENCY OR MISSION CRITICAL PERFORMANCE IN WHICH THE FAILURE OF THE EQUIPMENT COULD LEAD TO DEATH, PERSONAL INJURY, PHYSICAL OR ENVIRONMENTAL DAMAGE. BUYER ACCEPTS ALL RESPONSIBILITY AND LIABILITY FOR RADIO SYSTEM USAGE BEFORE REGIONAL ACCEPTANCE. During any period in which Pre-acceptance Site Usage is granted by Seller to Buyer, Buyer acknowledges that Seller has no liability to keep sites operational and Coverage will not be guaranteed until Regional Acceptance is complete. Further, Buyer acknowledges that site or system outages will occur, and that Seller has no commitment to inform Buyer of any such outages, however if planned outages are expected Seller shall notify System Administrator twenty-four (24) hours in advance. To ensure the continuation of the implementation of the NSRS Region in a timely manner so as not to delay the overall implementation for all NSRS Members, Seller shall have no obligation to support users operating on any Pre-acceptance Site.

I. As used in the Agreement, the term "Regional Acceptance Date" shall mean the date of "Acceptance" of one of the NSRS Regions, which shall be deemed to occur upon the earlier of: (1) the date on which the NSRS Region is deemed accepted pursuant to subsection (C) above, or (2) the date on which the Region is deemed accepted pursuant to subsection (G) above.

J. Commitments and Assumptions.

a. Seller will provide a Testing Coordinator who will establish the approach, reasonably acceptable to the Parties, to measure, record and report progress on all testing activities.
b. Seller will ensure the technical environment is set up to support each round of testing.
c. Testing activities for each portion of the Project will be completed in accordance with the Acceptance Testing Plans.
d. Seller will promptly provide a written summary of each round of comprehensive Acceptance Testing.
e. All Acceptance Testing will be performed by Seller with the cooperation and under the observation and supervision of Buyer and other NSRS Members.

SECTION 14. SOFTWARE LICENSE.

Subject to the terms and conditions of the Software License Agreement attached hereto as an exhibit to this Agreement, Buyer is granted a license to use the Software only in conjunction with the System purchased under this Agreement. "Software" means the "Licensed Programs" as defined in the Software License Agreement.

SECTION 15. COVERAGE:

Seller's representations concerning the distance at which usable radio signals will be transmitted and received by Hardware supplied hereunder are set forth in the Statement of Work. Coverage for the System as approved at the Detail Design review, shall be measured as provided in the Testing and Acceptance section of this Agreement.

SECTION 16. WARRANTIES:

A. Hardware and Services

The warranties for the System, including all Services, Software and Hardware, set forth in the Purchase Agreement Documents shall begin on the date of the first NSRS Regional Acceptance Date and continue for a period of one year following Acceptance of the last NSRS Region implemented

(the "Warranty Period"). Seller warrants for the Warranty Period, that the Hardware and installation Services furnished by Seller under this Agreement, and further specified in Statement of Work, Exhibit 11, Warranty Plan, shall be new, free from defects in material and workmanship and shall conform to the Agreement specifications. Any Services provided during the Warranty Period are set forth in the Scope of Work. Any and all claims for breach of this warranty are conclusively deemed waived unless made within the Warranty Period. The warranty period for additional Hardware purchased by Buyer from Seller after System Acceptance shall be warranted for the following periods of time from the date the Hardware is delivered to Buyer:

i. for mobile and portable radios ("Subscriber Units"), twenty-four (24) months.
ii. for all other Hardware, one (1) year.

B. **Subscriber Units:** Subscriber Unit warranty period shall begin at the date put into service and run for a period of twenty-four 24(months). Subscriber Unit accessories, including batteries, are warranted for a period of one year. For purposes of this Warranty the Subscriber Unit's batteries supplied by Seller shall be deemed defective if: (1) the battery capacity is less than 80% of rated capacity, or (2) the battery develops leakage. Replacement batteries shall be warranted only for the remaining unexpired portion of the Warranty Period. This warranty becomes void if: (1) the battery has been subjected to any kind of misuse, detrimental exposure, or has been involved in an accident, or (2) the battery is used in equipment or service other than the Hardware for which it is specified.

C. During the Warranty Period if any component of the Hardware or portion of the installation Services fails to meet the foregoing warranties, Seller's sole obligation and Buyer's exclusive remedy under this warranty shall be the correction by Seller of the failure at Seller's option: (1) by repairing any defective component of the Hardware, or (2) by furnishing any necessary repaired or replacement parts, (3) by the redoing of the faulty installation, or replacement per section D, E or F below. Any such failure, or the repair or replacement of the defective component or the redoing of any installation, shall not extend the Warranty Period. Where such failure cannot be corrected by Seller's reasonable efforts, the parties will negotiate an equitable adjustment in price. Seller will be responsible for all charges incurred in returning defective parts to Seller's plant and shipping repaired or replacement parts to Buyer. All warranty labor must be performed by an authorized service group approved by Seller either at its place of business, for mobile or portable equipment, or at the Buyer's location for fixed location equipment should Seller determine that it is not feasible to return the fixed location equipment to Seller's authorized service group.

D. **Harris Manufactured Infrastructure Equipment – Defects & Recurring Failures -** Any Harris manufactured fixed equipment or Harris manufactured fixed equipment module that fails twice during the acceptance test or twice during the first 12 months after System Acceptance shall be indicative of a recurring or systemic failure or defect that warrants further investigation by the Seller and Members. If the defect is deemed by the Members and Harris to be systemic after the investigation is completed, the Seller shall then be responsible for replacing at no additional cost to the Members all components and/or equipment that is deemed to be causing the systemic failure.

If, during the first 5 years after Final System Acceptance, 10% of a single type of Harris manufactured component, equipment or material fails, an investigation by the Seller and Members will be performed on any such failed component, equipment or material. If such failure is deemed by Members and Harris to be due to a product defect, Seller shall replace one hundred percent (100%) of this type of component, equipment or material NSRS-wide at no additional cost to the Members, regardless of whether or not it has failed, including any component, equipment or material previously replaced.

E. **Harris Manufactured Dispatch Equipment – Defects & Recurring Failures -** If 10% Harris Manufactured of console equipment that fails for the same reason during the acceptance test or during the first 12 months after equipment acceptance shall be indicative of a recurring or systemic failure or defect that warrants further investigation by the Seller and the concerned Member. If the defect is deemed by Member and Harris to be systemic after the investigation is completed, the Seller shall then be responsible for replacing at no additional cost to the Member all Harris Manufactured console equipment related to the recurring or systemic failure, not only the specific equipment affected.

F. **Harris Manufactured Subscriber Unit Equipment – Defects & Recurring Failures** - If 10% Harris Manufactured of Subscriber Unit equipment that fails for the same reason during the acceptance test or during the first 12 months after equipment acceptance shall be indicative of a recurring or systemic failure or defect that warrants further investigation by the Seller and the concerned Member. If the defect is deemed by Member and Harris.to be systemic after the investigation is completed, the Seller shall then be responsible for replacing at no additional cost to the Member all Harris Manufactured Subscriber Unit equipment related to the recurring or systemic failure, not only the specific equipment affected.

G. NSRS Member Performed Warranty Repair - The Members shall have the right to perform any maintenance and/or repairs required during the warranty period without voiding or affecting the Seller's warranty. Member technicians that complete the repairs must have taken all training classes outlined by Harris in the Statement of Work, Exhibit 11 – Warranty Plan , otherwise the work may void the warranty for said component. If Member work causes further system issues because of improper or negligent repair and a deeper level of Harris support be required, Harris may charge Member for such additional support if requested by member.

H. Any additional purchases of equipment, including radios, and installation services which may be purchased by Members and delivered or performed by Seller after Final System Acceptance, shall be warranted on the same terms, limitations, and exclusions as are set forth herein, except that the warranty on the equipment and installation services shall be for a period of two (2) years for additional Subscriber Units items from the date of delivery of that item of equipment, one (1) year for additional Infrastructure Hardware items from the date of delivery of that item of equipment, and one (1) year from the date of completion of that installation service.

I. With the exception of the NSRS Member Performed Warranty Repair as defined in section G. Above, Seller's obligations shall not apply to: (1) Hardware or components thereof which are normally consumed in operation, or, or (2) defects which are the result of improper storage, use, or installation performed by other than Seller, maintenance performed by other than Seller, or repair performed by other than Seller, or (3) Hardware which has been subjected to any other kind of misuse or detrimental exposure or has been involved in an accident, or (4) Hardware or installations altered or repaired by any party other than Seller without Seller's prior written consent.

J. While on Member's premises, Seller, its agents, employees, or Subcontractors shall conform in all respects with physical, fire, or other security regulations. Seller shall be responsible for care of Buyer's equipment and any damage to facilities during servicing.

K. **Coverage and System Integration Warranty.** Notwithstanding the other provisions of this Section Warranties, Seller's only Warranty as to radio coverage is that the System, prior to Regional Acceptance, shall have successfully passed the coverage tests in the Acceptance Test Plan. This

Warranty is operative only when the Shared Regional Implementation occurs. For Coverage and System Integration purposes, the Testing and Acceptance section of this agreement defines on a Regional basis, that if the NSRS Region does not fulfill the requirements of the Acceptance Tests, and the failure is solely attributable to Seller obligations under this Contract, Seller shall promptly correct the defects at no additional cost to the Member and other NSRS Members as needed.

L. **Software**

The warranty for the Software is set forth in the Software License Agreement. The Seller shall update all devices to the same and latest release level prior to the conclusion of the Warranty Period at no additional cost to the Members.

M. THE WARRANTIES AND REMEDIES SET FORTH IN THIS SECTION AND IN THE SOFTWARE LICENSE AGREEMENT CONSTITUTE THE ONLY WARRANTIES WITH RESPECT TO THE HARDWARE, SOFTWARE AND SERVICES AND THE BUYER'S EXCLUSIVE REMEDIES IN THE EVENT SUCH WARRANTIES ARE BREACHED. THEY ARE IN LIEU OF ALL OTHER WARRANTIES WHETHER WRITTEN, ORAL, EXPRESS, IMPLIED, OR STATUTORY INCLUDING, WITHOUT LIMITATION, THE WARRANTY OF MERCHANTABILITY AND THE WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL SELLER BE LIABLE FOR SPECIAL, CONSEQUENTIAL OR INDIRECT DAMAGES INCLUDING, BUT NOT LIMITED TO, LOSS OF PROFITS OR REVENUES.

SECTION 17. COOPERATIVE PURCHASING:

Purchases by Other Public Entities: This Agreement may be used by other public bodies to purchase subscriber equipment at the prices set forth below and in accordance with the terms, including applicable warranties of this Agreement unless otherwise specified herein. This pricing cannot be combined with any other Harris promotional offers. Such public bodies shall place their own order(s) directly with Seller, and Seller shall deal directly with any public body the Buyer approves to use the Agreement. The terms and conditions of this Agreement shall govern purchases by other public bodies unless they and the Seller agree to execute separate contracts. With the approval of the Seller, any public body using this Agreement may add terms and conditions required by statute, ordinances, or regulations. To the extent permitted by law, the parties may agree to additional or modified terms and conditions unique to the public body or as required by the circumstances surrounding the purchase. Buyer is not liable for the obligations of any public body which joins or uses this Agreement to purchase subscriber equipment at the prices set forth in the pricing schedule and in accordance with the terms, including applicable warranties of this Agreement unless otherwise specified herein. Buyer, its officials and employees are not responsible for placement of orders, invoicing, payments, contractual disputes, or any other transactions between the Seller and any other public bodies. In no event shall Buyer, its officials or employees be responsible for any costs, damages or injury resulting to any party from use of a Buyer contract. If, when preparing such a contract, the additional terms and conditions of a public body seeking to purchase pursuant to cooperative procurement are unacceptable to the Seller, the Seller may withdraw its consent to extension of the contract to that particular body. Buyer, assumes no responsibility for any notification of the availability of this Agreement for use by other public bodies, but the Seller may carry out such notification.

SECTION 18. INTERFERENCE:

Radio System coverage and performance are subject to degradation due to anomalous propagation and interference beyond the reasonable control of Seller. Seller cannot be responsible for degradation or disruption of Service caused by operation of other radio Systems or by natural phenomena or other interference over which the Seller has no reasonable control. In the event of a case of degradation due to interference by an

outside party, Seller will provide engineering support to Buyer at Buyer's expense to support Buyer's efforts in resolving the interference issue with the outside party. In the event of a case of degradation due to interference of the Buyer's System caused by Seller , Seller will resolve the interference issue at no cost to the Buyer.

SECTION 19. PATENTS:

A. Seller warrants that the System furnished hereunder shall be delivered free of any rightful claim of any third party for infringement of any United States patent or copyright. If Buyer notifies Seller promptly of the receipt of any claim that the System infringes a United States patent or copyright and gives Seller information, assistance and exclusive authority to settle and defend such claim, Seller at its own expense shall defend, or may settle, any suit or proceeding against Buyer so far as based on a claimed infringement which breaches this warranty. If, in any such suit arising from such claim, the continued use of the System for the purpose intended is enjoined by any court of competent jurisdiction, Seller shall, at its expense and option, either: (1) procure for Buyer the right to continue using the System, or (2) modify the System so that it becomes non-infringing, or (3) replace the System or portions thereof so that it becomes non-infringing, or (4) remove the System and refund the purchase price (less reasonable depreciation for use). The foregoing states the entire liability of Seller for patent or copyright infringement by the System and is subject to any limitation of total liability set forth in this Agreement.

B. The preceding subsection (A) shall not apply to: (1) any portion of the System which is manufactured to Buyer's design, or (2) the use of the System in conjunction with any other apparatus or material not supplied by Seller to the extent that such conjoined use causes the alleged infringement. As to any portion of the System or use described in the preceding sentence, Seller assumes no liability whatsoever for patent infringement.

C. THE PATENT AND COPYRIGHT WARRANTY AND INDEMNITY OBLIGATIONS RECITED ABOVE ARE IN LIEU OF ALL OTHER PATENT AND COPYRIGHT WARRANTIES AND INDEMNITIES WHATSOEVER, WHETHER ORAL, WRITTEN, EXPRESS, IMPLIED OR STATUTORY.

SECTION 20. LIMITATION OF LIABILITY:

A. Except for Seller's liability to third parties for its willful misconduct or negligent acts or omissions as more particularly described in the Indemnification Section of this Agreement, the total liability of Seller, including its subcontractors or suppliers, for all claims of any kind for any loss or damage, whether in contract, warranty, tort strict liability or otherwise, arising out of, connected with, or resulting from the performance or non-performance of this Agreement or from the manufacture, sale, delivery, installation, technical direction of installation, resale, repair, replacement, licensing or use of any Hardware, Software or the furnishing of any Service, shall not exceed the Total Price of the Agreement. Except as to title, any such liability shall terminate upon the expiration of the Warranty Period.

B. IN NO EVENT, WHETHER AS A RESULT OF BREACH OF AGREEMENT, WARRANTY, TORT (INCLUDING NEGLIGENCE OR INFRINGEMENT), STRICT LIABILITY OR OTHERWISE, SHALL SELLER, OR ITS SUBCONTRACTORS OR SUPPLIERS, BE LIABLE FOR ANY SPECIAL, CONSEQUENTIAL, INCIDENTAL, INDIRECT OR EXEMPLARY DAMAGES INCLUDING, BUT NOT LIMITED TO, LOSS OF PROFITS OR REVENUES, LOSS

OF USE OF THE HARDWARE OR ANY OTHER EQUIPMENT, COST OF CAPITAL, COST OF SUBSTITUTE GOODS, FACILITIES, SERVICES OR DOWNTIME COSTS.

C. Any action for any claim of any kind for any loss or damages arising out of, connected with, or resulting from the performance, non-performance or breach of the Agreement, or from the manufacture, sale, delivery, installation, technical direction of installation, resale, repair, replacement, licensing or use of any Hardware, Software or the furnishing of any Services, shall be commenced within statutory limits defined by the State of Nevada after the cause of action accrued.

D. The provisions of this Section, LIMITATION OF LIABILITY, shall apply notwithstanding any other provisions of this Agreement or any other agreement.

E. The provisions of this Section, LIMITATION OF LIABILITY, shall survive the expiration or termination of this Agreement.

SECTION 21. TERMINATION AND REMEDIES:

A. Any agreement which extends beyond the term of any Washoe County Commissioner in office at the time of the signing of this Agreement is binding beyond that term only if funding is appropriated. NRS 244.320. Washoe County reasonably believes that funds can and will be obtained sufficiently to make all payments during the term of this Agreement. In the event the County fails to appropriate or budget funds for the purposes specified in this Agreement, or that County has been required, in its sole judgment, to amend previous appropriations or budgeted amounts to eliminate or reduce funding for the purposes in this Agreement, this Agreement shall be terminated without penalty, charge or sanction to the County.

B. A default or breach may be declared with or without termination. This Agreement may be terminated by either Party upon written notice of default or breach to the other Party as follows:

a. In the event of a material breach of this Agreement by Seller which shall continue for one hundred twenty (120) or more days after written notice of such breach (including a reasonably detailed statement of the nature of such breach) shall have been given to Seller by Buyer, Buyer shall be entitled to avail itself cumulatively of any and all remedies available at law or in equity (provided such remedies are not otherwise limited under the terms of this Agreement) and either: (1) suspend performance of its payment obligations under the Agreement for as long as the breach continues uncorrected; or (2) terminate this Agreement by written notice to Seller if the breach remains uncorrected. The following shall constitute material breaches of this Agreement:

1. Failure by Seller to reasonably provide or perform any of the services or duties called for in this Agreement within the time requirements provided for in this Agreement, or any agreed to extensions.
2. violation by Seller of any State, Federal or local law, or failure by Seller to comply with any applicable States and Federal service standards, as expressed by applicable statutes, rules and regulations.
3. failure by Seller to carry applicable licenses or certifications as required by law.
4. failure of Seller to comply with reporting requirements contained herein.
5. inability of Seller to perform the Work provided for herein.
6. Seller becomes insolvent, subject to receivership, or becomes voluntarily or involuntarily subject to the jurisdiction of a bankruptcy court

C. Except as otherwise provided in this Agreement, in the event of: (1) any failure by Buyer for sixty (60) or more days to make any payment when due, or (2) any other material breach of this Agreement by Buyer which shall continue for one hundred twenty (120) or more days after written notice of such breach (including a reasonably detailed statement of the nature of such breach) shall have been given to Buyer by Seller, Seller shall be entitled to avail itself cumulatively of any and all remedies available at law or in equity (provided such remedies are not otherwise limited under the terms of this Agreement) and either: (1) suspend performance of its obligations under this Agreement for as long as the breach remains uncorrected; or (2) terminate this Agreement by written notice to Buyer if the breach remains uncorrected.

D. Except as provided in Section 21 ¶A , in the event Buyer terminates this Agreement as provided herein, all finished and unfinished Hardware and Documentation Deliverables produced or made by Seller for Buyer ,up to and including the date of termination, under this Agreement shall become the property of Buyer and Seller shall be entitled to receive compensation, including all associated fees accrued up to the point of termination, in accordance with the terms of this Agreement for any such Hardware and Documentation Deliverables. Notwithstanding the above, Seller shall not be relieved of liability to Buyer for damages sustained by Buyer by virtue of any breach of this Agreement by Seller described in subsection B above and, after providing Seller with written notice of breach as set forth in subsection B, Buyer may withhold any payments to Seller for the purpose of set-off of any damages, as agreed upon or finally adjudicated, against such payment. Harris shall use commercially reasonable efforts to resell or return any unopened Equipment after termination.
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SECTION 22. CONFIDENTIALITY:

A. During the term of this Agreement, it is anticipated that one party (hereafter the "Disclosing Party") may disclose to the other party (hereafter the "Receiving Party") information which the Disclosing Party considers proprietary and confidential. Accordingly, with respect to any specification, drawings, sketches, models, samples, tools, technical information, confidential business information or data, in written or other tangible form which: (1) has been designated in writing by the Disclosing Party as confidential or proprietary, or (2) is of the type that the Receiving Party customarily treats as confidential or proprietary, and which is furnished by the Disclosing Party to the Receiving party in contemplation of or under this Agreement (hereinafter "Information"), the Receiving Party shall treat such Information, for a period of five (5) years after the Effective Date of this Agreement, as confidential information with the same degree of care as the Receiving Party affords to confidential information of its own of a similar nature and shall not reproduce any such Information, in whole or in part, except as specifically authorized in writing by the Disclosing Party.

B. The provisions of the preceding subsection shall not apply to any Information which:

1. is or shall become publicly available without breach of this Section Confidentiality, on the part of the Receiving Party;
2. is already known by the Receiving Party prior to receipt from the Disclosing Party;
3. is independently developed by the Receiving Party;
4. is rightfully obtained by the Receiving Party from third parties without restriction; or
5. is required to be disclosed by appropriate governmental or judicial order provided that Receiving Party gives Disclosing Party prior written notice of such order and assists Disclosing Party in taking reasonable actions to restrict such order.
6. Is declared by Federal or Nevada law such as NRS Chapter 239 to be public.

C. The provisions of this Section, Confidentiality, shall survive the expiration or termination of this Agreement.

D. The confidentiality obligations of this Section, Confidentiality, shall not apply to Software, the confidentiality and other rights and obligations with respect to which are set forth in the Software License Agreement.

SECTION 23. COMPLIANCE:

Seller agrees to comply with all federal, state and local laws, ordinances, codes, rules and regulations in effect as of the Effective Date of this Agreement that may in any way affect the Work by Seller hereunder. Any Hardware or Software furnished by Seller under this Agreement shall comply in all material respects with federal, state and local laws and regulations applicable to the manufacture, packing, sale and shipment of such Hardware or Software as of the Effective Date of this Agreement and shall comply with any amendments thereto which may have come into effect prior to the time such Hardware or Software are delivered provided that the price and, if necessary, delivery of such Hardware or Software shall be equitably adjusted to compensate Seller for the effect of compliance with any such amendments.

SECTION 24. NOTICES:

Notices and other communications between the parties shall be transmitted in writing by certified mail or nationally recognized overnight courier service to the parties at the addresses set forth below and shall be deemed effective upon receipt by the receiving party. Either party may change its address by giving notice in writing thereof to the other party.

IF TO BUYER:
Craig Betts, Chief Information Officer
Washoe County, Technology Services
1001 E. Ninth St.
Reno, NV, 89512
Phone: (775) 328-2355
Email: cbetts@washoecounty.us

WITH A COPY TO:
Quinn Korbulic, IT Manager
Washoe County, Technology Services
1001 E. Ninth St.
Reno, NV, 89512
Phone: (775) 328-2348
Email: qkorbulic@washoecounty.us

BUYER INVOICE CONTACT:
Sara Delozier
Washoe County, Technology Services
1001 E. Ninth St.
Reno, NV, 89512
Phone: (775) 328-2352
Email: sdelozier@washoecounty.us

IF TO SELLER:
Harris Corporation

221 Jefferson Ridge Parkway
Lynchburg, Virginia 24501
Attn: [Scott Tangeman]

WITH A COPY TO:
Harris Corporation
221 Jefferson Ridge Parkway
Lynchburg, Virginia 24501
Attn: [Thomas Clair]

SELLER INVOICE CONTACT:
Harris Corporation
221 Jefferson Ridge Parkway
Lynchburg, Virginia 24501
Attn: April Gallagher
434-455-9272 / agalla03@harris.com

SECTION 25. ORDER OF PRECEDENCE:

The Statement of Work and the following Exhibits are expressly incorporated herein by reference and, together with this Agreement, constitute the Agreement Documents. In the event of a conflict among or between the Agreement Documents, the documents shall control in the order of precedence set forth below:

1. Amendments to this Agreement
2. This Agreement (not including the Exhibits and documents listed below)
3. Detailed Design Documents
4. **Exhibit A** - Statement of Work, with Attachments
5. **Harris Proposal**
6. **RFP**
7. **Exhibit B** - Software License Agreement
8. **Exhibit C** – Form of Surety Bond for Performance

SECTION 26. TERM:

The term of this Agreement shall commence upon the Effective Date of this Agreement and shall continue for five (5) years from the date of Final System Acceptance. The term of the Software license is set forth in the Software License Agreement.

SECTION 27. ENTIRE AGREEMENT:

The entire agreement of the parties is contained herein and this Agreement supersedes any and all oral agreements and negotiations between the parties relating to the subject matter hereof.

SECTION 28. AMENDMENT:

The parties expressly agree that this Agreement shall not be amended in any fashion except in a writing(s) executed by authorized representatives of both parties.

SECTION 29. SEVERABILITY:

If any provision of this Agreement is held to be illegal, invalid, or unenforceable by a court of competent jurisdiction, the parties shall, if possible, agree on a legal, valid, and enforceable substitute provision that is as similar in effect to the deleted provision as possible. The remaining portion of the Agreement not declared illegal, invalid, or unenforceable shall, in any event, remain valid and effective for the term remaining unless the provision found illegal, invalid, or unenforceable goes to the essence of this Agreement.

SECTION 30. WAIVER:

No term of this Agreement may be waived except in a writing signed by the party waiving enforcement. No term of this Agreement shall be deemed to be waived by reason of any failure to previously enforce such term. In no event shall the making of any payment required by this Agreement constitute or be construed as a waiver by Buyer of any breach of the covenants of this Agreement or a waiver of any default of Seller and the making of any such payment by Buyer while any such default or breach shall exist shall in no way impair or prejudice the right of Buyer with respect to recovery of damages or other remedy as a result of such breach or default.

SECTION 31. HEADINGS:

Section headings are inserted for convenience only and shall not be used in any way to construe the meaning of terms used in this Agreement.

SECTION 32. GOVERNING LAW:

The parties agree that this Agreement is entered into in the State of Nevada and shall therefore be governed by the laws of Nevada without resort to conflict of laws principles. Venue for any legal proceedings shall be in any state or federal court in Washoe County, Nevada, which the Parties agree shall have exclusive jurisdiction over disputes arising out of the interpretation of this Agreement. It is expressly understood and agreed to by the parties hereto that in the event of any disagreement or controversy between the parties, law shall be controlling. Venue for any legal proceedings shall be in any state or federal court in the State of Nevada.

SECTION 33. ASSIGNMENT; SUCCESSORS AND ASSIGNS:

This Agreement shall not be assigned nor any interest or obligation in this Agreement transferred by either Party without the written consent of the other Party, which shall not be unreasonably withheld or delayed. Notwithstanding the above, Seller may assign this Agreement, without consent, in the event of a change of controlling ownership interest (either directly or indirectly) in Seller or in the event of merger, recapitalization, consolidation, other business combination or sale of all or substantially all of the assets of Seller. In addition, Seller may also assign or transfer, without consent, claims for money due or to become due Seller from Buyer under this Agreement to a bank, trust company or other financial institution if and only if the instrument of assignment contains a provision substantially to the effect that it is agreed that the right of the assignee in and to any moneys due or to become due to Seller shall be subject to prior claims of all persons, firms and corporations for services rendered or materials supplied for the performance of the Work called for in this Agreement. Seller shall promptly .provide to Buyer notice of any such permitted assignment or transfer without consent.

SECTION 34. ANTI DISCRIMINATION

In connection with the performance of work under this Agreement, the parties agree not to discriminate against any employee or applicant for employment because of race, creed, color, national origin, sex, sexual orientation gender identity or expression, age, disability or national origin including, without limitation, with regard to employment, upgrading, demotion or transfer, recruitment or recruitment

advertising layoff or termination, rates of pay or other forms of compensation, and selection for training, including, without limitation, apprenticeship. The parties further agree to insert this provision in all subcontracts hereunder, except subcontracts for standard commercial supplies or raw materials

During the performance of this Agreement, the Seller, for itself, its assignees and successors in interest agrees as follows:

a. Compliance with Regulations: The Seller shall comply with all of the regulations relative to nondiscrimination in federally-assisted programs of 49 CFR Part 21 and the non-discrimination provisions of NRS Chapter 613 as they may be amended from time to time (collectively "Regulations"), which are herein incorporated by reference and made a part of this Agreement.

b. Nondiscrimination: The Seller, with regard to the professional services performed by it during the Agreement, shall not discriminate on the grounds of race, color, age, religion, sex, creed, handicap, or national origin in the selection and retention of subcontractors, including procurement of materials and leases of equipment. The Seller shall not participate either directly or indirectly in the discrimination prohibited by the Regulations, including employment practices, when the Agreement covers a program set forth in the Regulations.

c. Solicitations for Subcontracts, Including Procurement of Materials, and Equipment: In all solicitations either by competitive bidding or negotiation made by the Seller for professional services to be performed under a subcontract, including procurement of materials or leases of equipment, each potential subcontractor or supplier shall be notified by the Seller of the Seller's obligations under this Agreement and the Regulations relative to nondiscrimination on the grounds of race, color, age, religion, sex, creed, handicap, or national origin.

d. Information and Reports: The Seller shall provide all information and reports required by the Regulations, or directives issued pursuant thereto, and shall permit access to its facilities as may be determined by the County to be pertinent to ascertain compliance with such Regulations or directives. Where any information required of a Seller is in the exclusive possession of another who fails or refuses to furnish this information, the Seller shall so certify to the County and shall set forth what efforts it has made to obtain the information.

e. Sanctions for Noncompliance: In the event of the Seller's noncompliance with the nondiscrimination provisions of this Agreement, the County shall impose such sanctions as it may determine to be appropriate, including, but not limited to:

1. Withholding of payments to the Seller under the Agreement until the Seller complies, and/or
2. Cancellation, termination, or suspension of the Agreement, in whole or in part

g. Incorporation of Provisions: The Seller will include the provisions of Paragraphs (a) through (f) above in every subcontract including procurement of materials and leases of equipment, unless exempt by Regulations, order, or instructions issued pursuant thereto. The seller will take such action with respect to any subcontract or procurement as the County may direct as a means of enforcing such provisions including sanctions for non-compliance. In the event Seller becomes involved in, or is threatened with litigation by a subcontractor or supplier as a result of such direction, the Seller may request the County to enter into such litigation to protect the interests of the County and the Seller may request the United States to enter into such litigation to protect the interests of the United States.

SECTION 35. DISPUTE RESOLUTION PROCEDURES

Issue Resolution Ladder

The Issue Resolution Ladder is the process for elevating Disputes from the Project's field level to various levels of review, up to the Parties' executive management if necessary, with defined time limits for each level of review. The goal of the Issue Resolution Ladder is to resolve each Dispute as close to the field level as possible while recognizing the requirement to elevate the Dispute to the next level of review before the Dispute impacts cost or schedule. The Issue Resolution Ladder shall consist of four (4) levels of review and corresponding time limits to review, as follows:

Level of Review	Seller Reviewer	Buyer Reviewer	Time Limit
4	Seller CEO	Office of the County Manager	2 weeks
3	Regional Manager	Chief Information Officer	2 weeks
2	Project Manager	Project Manager	1 week
1	Technical Lead	Technical Lead	3 days

The individuals from the Buyer's and Seller's respective organizations filling the roles of reviewers in the Issue Resolution Ladder, and the documentation required for each level of review in the Issue Resolution Ladder, shall be identified by the respective team members. If reviewers at any level of the Issue Resolution Ladder cannot resolve a Dispute within the time limits set forth, the reviewers shall elevate the Dispute to the next level of review. If all four (4) levels of review have been exhausted, then Section B. below shall apply.

For purposes of Outcome of Issue Resolution Ladder

1. If the Buyer and Seller succeed in resolving an issue using the Issue Resolution Ladder, the Parties shall memorialize the resolution in writing, including execution of any Change Order as appropriate, and promptly perform their respective obligations in accordance therewith.
2. If a Dispute is not timely resolved using the Issue Resolution Ladder, then the parties agree to submit the dispute to non-binding mediation using a single mediator mutually agreed upon by the parties and following the Commercial Mediation Rules of the American Arbitration Association ("AAA"). As to the appointment of the mediator, and in accordance with the AAA, section M-4 Appointment of the Mediator, the Parties shall mutually agree to appoint an impartial mediator residing in Nevada or familiar with Nevada law and appoint such mediator for any dispute submitted to the American Arbitration Association for mediation or conciliation. If the dispute is unable to be resolved through good faith negotiations and non-binding mediation, then the Parties may pursue all of their legal and equitable remedies.

State court Litigation Only if the Parties are unable to settle a Dispute following Section B. above, then either Party may thereafter file a lawsuit in the Nevada Second Judicial District Court located in Washoe County, Nevada. Said lawsuit shall be filed no later than 180 days following issuance of the mediation finding. Service of the complaint shall be as prescribed by law and all parties agree to waive jury trial and rely on an objective procedure before a judge experienced in matters of commercial law.

Continuation of Work and Payments

1. At all times during Dispute Resolution Procedures, Seller and all Seller-Related Entities shall continue with the performance of the Work and their obligations, including any undisputed Work or obligations, diligently and without delay, in accordance with this Contract, except to the extent enjoined by order of a court or otherwise approved by the Buyer in its sole discretion. Seller acknowledges that it shall be solely responsible for the results of any delaying actions or inactions taken during the course of Dispute Resolution Procedures relating to the disputed Work even if Seller's position in connection with the Dispute ultimately prevails.

2. During the course of any Dispute Resolution Procedures, the Parties shall continue to comply with all provisions of the Contract Documents, the Project Management Plan, the Governmental Approvals, and applicable Governmental Rules.

3. During the course of any Dispute Resolution Procedures, Buyer shall continue to pay to Seller, when due, all undisputed amounts owing under this Agreement.

Joinder- Seller agrees that, (a) at the Buyer's request, Seller shall take appropriate action to join third parties and Subcontractors involved in the design or construction of any part of the Project as parties in dispute resolution proceedings under this Section 19, and (b) Seller will allow itself to be joined as a participant in any dispute, arbitration or other proceeding that involves Buyer and any other Person relating to the Project. This provision is for the benefit of the Buyer and not for the benefit of any other party.

Harris Effect on Surety - Any decisions made in accordance with this Section 35 that are binding on Seller shall also be binding on the Surety under the Performance Bond; provided, however that unless the Surety is a party to such proceedings, such decisions shall not affect any defenses which are special to the Surety (i.e., defenses available to the Surety which could not have been asserted by Seller in the underlying proceeding). In the event that the Surety is a party to any proceedings, it shall have the right to, and must, assert any such special defenses therein.

Emergency Dispute Resolution - If a Dispute arises which must be resolved expeditiously to prevent serious damage to person or property, or serious interference with a Critical Path, both Parties shall make every effort to resolve such Dispute quickly. In such case, if Seller's Project Manager and the Buyer's Project Manager cannot reach a resolution of that Dispute within twenty-four (24) hours, they must refer the Dispute to the Buyer's Director and Seller's Chief Executive Officer (or other officer with authority to make final decisions subject only to board approval and any required third party approvals) for a meeting between the Buyer's Director and Seller's Chief Executive Officer to occur within the following twenty-four (24) hours. Once the urgent aspects of the Dispute have been resolved, the Parties may continue with the remaining procedures for dispute resolution if necessary and to the extent applicable.

Time Limitation – Seller acknowledges and agrees that Buyer is subject to substantial constraints which have resulted in limitations on its ability to increase the Contract Price or extend a Completion Deadline. Seller therefore acknowledges and agrees that, due to limitations on funding for the Project, prompt resolution of Disputes is of vital importance to Buyer. Seller agrees that the time limitations stated in the Contract for the filing of Claims and/or complaints with the Disputes Review Team and any subsequent State court litigation pursuant to Section 1.1.2 are necessary and reasonable.

SECTION 36. LIQUIDATED DAMAGES

Seller agrees to be subject to liquidated damages for failure to achieve Regional Acceptance in any NSRS Region by the date set forth in this Agreement or a change to the Regional Acceptance Date set forth in any revision to the project schedule, (described in Exhibit 6 Project Schedule), and further agrees that such liquidated damages are intended to be compensatory and do not constitute a penalty for late delivery. The parties acknowledge and agree that the harm suffered by reason of a failure to achieve a Regional Acceptance by the date set forth in this Agreement would be difficult or impossible to calculate with any certainty and that the liquidated damages set forth below represent a reasonable estimate of that harm. The liquidated damages set forth below are specifically applicable to a failure to obtain Regional Acceptance by the dates set forth in this Agreement only. Buyer's rights and remedies for other than late delivery are set forth in this Agreement and as are otherwise available at law or equity. If Seller fails to meet the schedule date for Regional Acceptance set forth in this Agreement, and after written notice from the Buyer and after thirty (30) calendar day opportunity to cure, the Buyer may assess Liquidated Damages against Seller as defined below:

a. Damages amount per day ((.005) X (Seller's contracted Total Agreement Price of effected NSRS Region)) / 60.

b. In no event shall the maximum amount of liquidated damages assessed against Seller for late deliveries under this Agreement exceed one half of one percent (.005 %) of the Total Agreement Price as agreed to in Section 6.

c. Notwithstanding the above, should the Project Schedule change due to a Change Order under this Agreement, the Project Scheduled date for Regional Acceptance may be extended to meet project requirements as mutually agreed by both parties.

d. If one of the NSRS members causes a delay to the schedule, Seller agrees to collaboratively draft a Change Order with the other NSRS members and Seller to continue the NSRS Regional Implementation. Such Change Order shall address any design and project schedule changes needed to effectively partially implement the NSRS Region. The NSRS Member causing the delay shall reimburse Harris through such Change Order for any costs including, but not limited to, redesign, remobilization, retesting or any re-execution of any activates defined in the Scope of Work in an NSRS Region where the delay occurred completing the NSRS Region's implementation for Seller at a later date. A delayed NSRS Region under this section shall not be subject to future Liquidated Damages. However, in the event that a subsequent revised schedule date is set in an approved Change Order and Seller fails to meet such date, it shall be subject to liquidated damages pursuant to this Section 36.

e. Seller shall have no liability for liquidated damages for any delay in achieving Regional Acceptance, if, after the Regional Acceptance Date, the delay is attributable to reasons other than Seller's delay, including but not limited to delay by NSRS Members and the Buyer's other Sellers, FORCE MAJEURE EVENTS OR OTHER EVENTS BEYOND SELLER'S REASONABLE CONTROL.

However, in the event that a subsequent revised schedule date is set in an approved Change Order and Seller fails to meet such date, it shall be subject to liquidated damages pursuant to this Section 36.

IN WITNESS WHEREOF, Buyer and Seller have executed this Agreement.

BUYER
[WASHOE COUNTY]

By: Marsha Berkbigler

Name: Marsha Berkbigler

Title: Chair County Commission

Date: 9-25-18

Witness:

By: Nancy L. Parent

Name: Nancy Parent

Title: County Clerk

Date: 9-25-18

By: Pamela Mann

Name: Pamela Mann

Title: Purchasing & Contracts Manager

Date: 9-27-18

Witness:

By: Pamela Matson

Name: Pamela L Matson

Title: Account Clerk II/Notary

Date: 9/27/18

PAMELA L. MATSON
Notary Public - State of Nevada
Appointment Recorded in Washoe County
No: 16-1488-2 - Expires February 10, 2020

SELLER
HARRIS CORPORATION ACTING THROUGH ITS COMMUNICATION SYSTEMS SEGMENT

By: Thomas Clair

Name: Thomas Clair

Title: Contracts Manager

Date: 9/17/2018

Witness:

By: Patricia K. Harpring

Name: PATRICIA K. HARPRING

Title: Executive Assistant

Date: 9/17/18

LIST OF EXHIBITS

Exhibit A - STATEMENT OF WORK (with Attachments)
Exhibit B - SOFTWARE LICENSE AGREEMENT
Exhibit C - FORM OF SURETY BONDS FOR PERFORMANCE
Exhibit D - INDEMNITIFCATION AND INSURANCE SPECIFICATIONS

EXHIBIT A

STATEMENT OF WORK

TABLE OF CONTENTS

Attachments to Exhibit A

System Description

Introduction

The new P25 Phase 1/Phase 2 700/800 MHz radio system for the State of Nevada will include 127 RF sites; 7 simulcast systems; 1 VIDA Premier HA Core; 2 VIDA Premier/Connect HA Cores; 4 ISSI interfaces; 75 CSSI connections; 34 NCRN sites; 156 Conventional connections for interoperability; 27 new Symphony consoles; 24 NDIP sites; 6 redundant logging recorders from Exacom; 6 Site-on-Wheels; 2 Asset Management Systems from MCM and 26 Network Management Terminals. This Statement of Work (SOW) addresses Washoe County's portion of the NSRS.

System Outline

The system consists of the following main elements:

- **Network System Control:** Harris will provide a VIDA Premier Core and a VIDA Premier/Connect Core for Washoe County's portion of the NSRS. This includes the provision of the primary VIDA Premier Core at Las Vegas SANS and the secondary VIDA Premier Core at Washoe NOC location. One VIDA Premier/Connect HA Core (in the northern region) will be provided to support 70 site locations for Washoe County, NDOT and NV Energy. For the VIDA Premier/Connect Core – North, the primary core will be located at Washoe NOC and the secondary core at Edison Way in Reno, NV. The VIDA Premier and VIDA Premier/Connect Cores support state-wide agency communications with management and administration services. The VIDA Premier/Connect cores are designed to work with the VIDA Premier Core.
- **RF Sites:** Harris will provide RF subsystem (base station and antenna system) equipment for 15 Washoe County repeater sites consisting of 4 simulcast cells and 7 Multisites linked to the VIDA Premier/Connect Cores via Washoe County's microwave IP network. The Washoe County microwave system will be required to connect to the primary VIDA Premier Core located in Las Vegas via NDOT's microwave network. RF Sites consist of 100-Watt P25 Phase 1/Phase 2, 700 or 800 MHz MASTR V base stations utilized for voice and data traffic. In addition, Harris will supply 1 site-on-wheels (SOW) for mobile communication deployments.

- **Microwave System:** Harris will provide a new 22 link microwave solution that interconnects 20 site locations consisting of the core sites, RF sites and the existing PSAP locations within Washoe County. Harris will implement the Nokia 7705 SAR-8 MPLS router at each microwave site for the routing of packets throughout the new microwave network and will setup the routers to interface with the NDOT microwave network. Harris will coordinate with NDOT to configure the 7705 SAR-8 to properly route packets between NDOT and Washoe County microwave networks.
- **Network Management System (NMS):** Harris will provide one Network Management and Administration system, located on the active VIDA Premier Core, accessible by any authorized console/user on the radio network. The management application will provide a tool for performance tracking, event and fault monitoring, and reporting. The administration application configures, provisions, and administers the P25 network database.
- **Interoperability Solution:** Harris will provide a P25 compliant Harris ISSI/CSSI. The ISSI allows Washoe County to connect to neighboring P25 systems while the CSSI is the interface to allow other external manufacturer's consoles to interoperate on the Harris VIDA system with the required interfacing equipment. The ISSI will be licensed for 4 concurrent system connections supporting 3 P25 system connections and one CSSI connection configured to support interoperation with 75 consoles. Those consoles must support ISSI/CSSI connectivity as well as configuration and interoperation of all supported features. The ISSI/CSSI will be located on the Primary VIDA Premier Core at Las Vegas SANS. Please see the ISSI gateway section for more details.
- **Dispatch Solution:** The Washoe County P25 System includes 12 new Symphony Consoles. Twenty-seven existing consoles will be upgraded to Windows 10. Existing Symphony console licenses will be transferred to new Cores.
- **Logging Recorder:** A single logging recorder with redundant components will record all radio traffic from Washoe County's RF sites, and Symphony consoles. The Exacom logging recorder will interface directly into Washoe County's VIDA Premier/Connect Core. Telephone audio will be captured on Washoe County's existing Verint logging recorder. The Verint recorder will be connected to the VIDA/Premier Connect Core at a future date, however its connection to the VIDA Core is not part of the initial P25 system deployment or under this contract. Harris will provide a quote for equipment and services to connect the existing Verint logging recorder to the new P25 VIDA Core when

requested by Washoe County. A single logging recorder with redundant components will be provided for the Washoe County School District.

- **Subscribers**: New radios will include high-tier, mid-tier and low-tier models of mobiles and portables and desktop control stations to accommodate various users. All radios will include Link Layer Authentication and OTAP. See radio details under Subscriber Equipment.

Description of the System

The new system will support Project 25 Phase 1 and Project 25 Phase 2 technology. The new system will provide coverage enhancements with a Delivered Audio Quality (DAQ) of 3.4 or better, increased user capacity, and functionality compared to the EDACS radio system it replaces. Harris will replace Washoe County's existing EDACS system with Voice Interoperability Data Access (VIDA) P25 technology. The VIDA system will allow Washoe County to maintain a cluster of sites covering its operational area. Figure 1, Figure 2 and Figure 3 depict high-level system block diagrams of the entire NSRS network, identifying which of those assets belong to Washoe County.

Figure 1. System Block Diagram – Primary VIDA Premier Core – South / Secondary VIDA Premier Core – North Premier Core Main

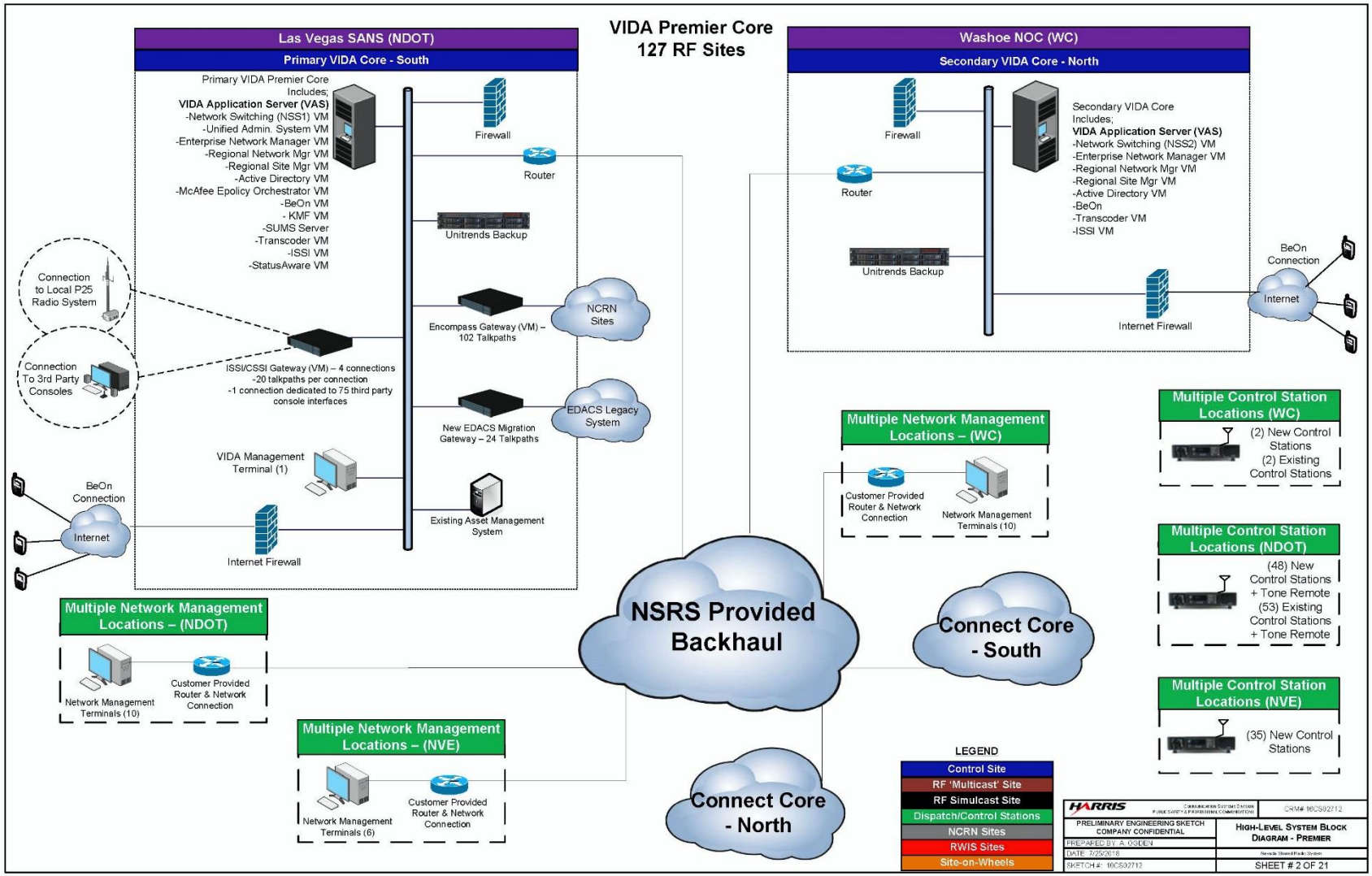


Figure 2. System Block Diagram – VIDA Premier/Connects North

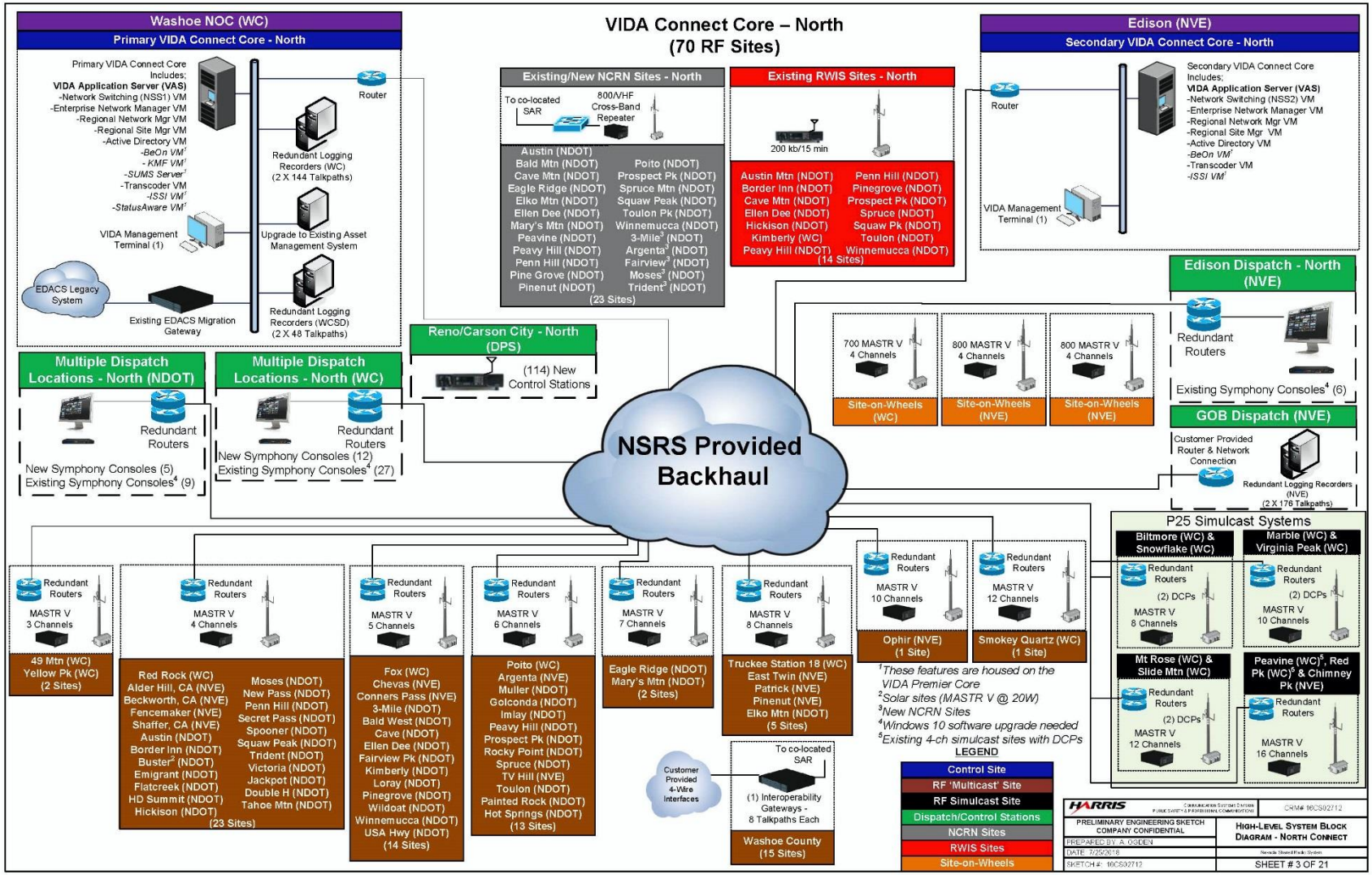
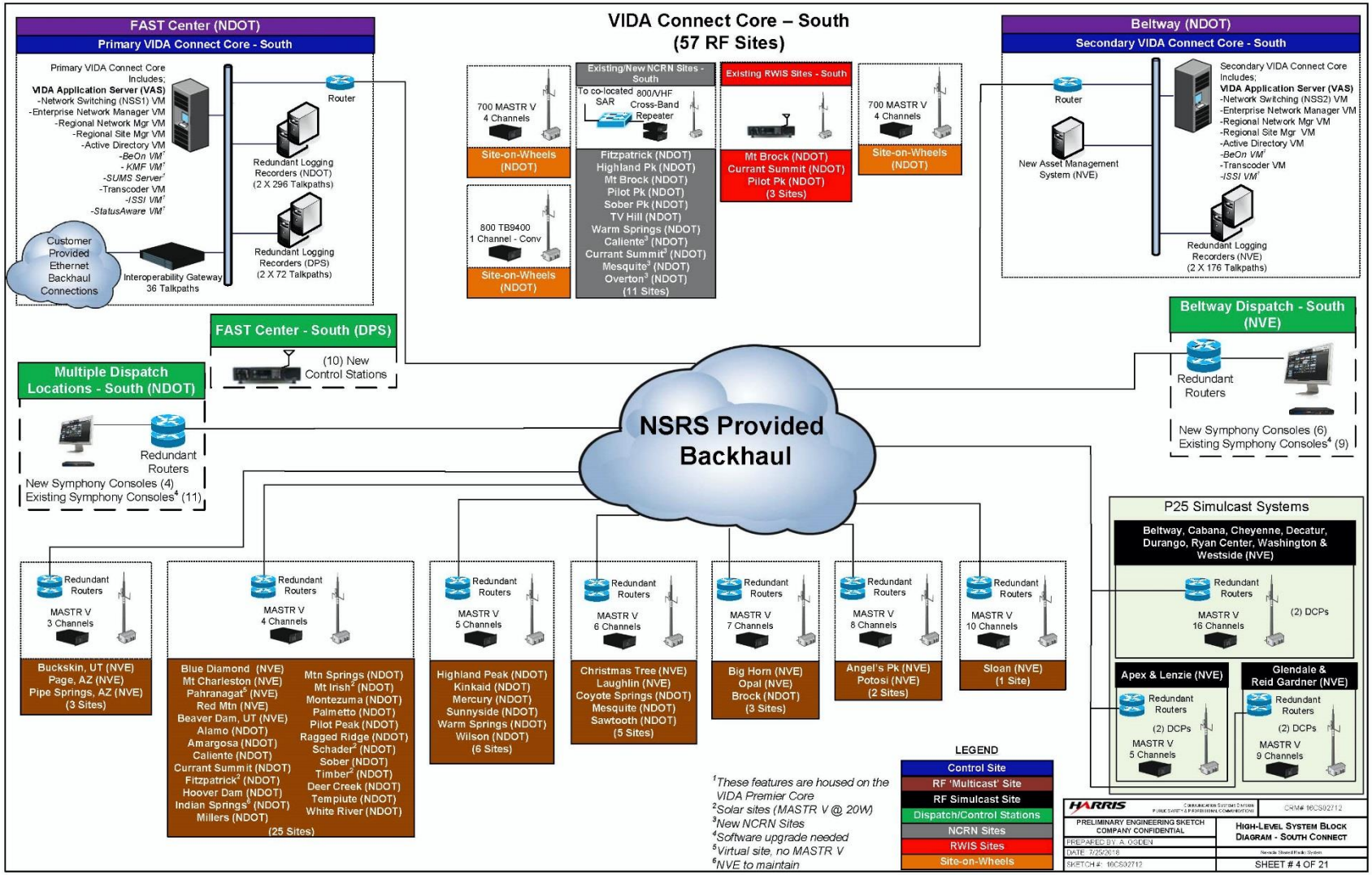


Figure 3. System Block Diagram – VIDA Premier/Connects South



Elements of the VIDA System Design

VOICE, INTEROPERABILITY, DATA, AND ACCESS (VIDA) CORE

With the new P25 system, Washoe County will have a geographically-separated, high-availability core fully integrated together to link all aspects of the NSRS to work as a single statewide system. The NSRS VIDA Premier/Connect Cores will control Washoe County sites and consoles. To support the Washoe County region, Harris will install the VIDA Premier and VIDA Premier/Connect Cores at the following locations:

- Las Vegas SANS – primary VIDA Premier Core
- Washoe NOC – secondary VIDA Premier Core
- Washoe NOC - primary VIDA Premier/Connect Core – North
- Edison (NVE) – secondary VIDA Premier/Connect Core – North

These locations will be supported by the Member's backhaul connectivity utilizing fiber optics and microwave Ethernet technology.

The VIDA Premier Core will provide the following features:

VIDA Premier Core Features				
Announcement Group	Deregistration	Global Positioning Satellite*	Over-the-Air-Programming	Recent User Priority
Automatic Site Registration	Dynamic Regrouping	Group Call	Over-the-Air-Rekeying	System-wide Calls
Automatic Site Switching	Emergency Alert	Link layer Authentication	Private Call	Talk Prohibit Tone
Busy Queuing and Callback	Emergency Call	Multigroup Call	Push-to-Talk ID	User Authentication
Call Alert	Enhanced Priority Levels	Out of Range Indication	Radio Inhibit	Voice Encryption

*See StatusAware section below.

StatusAware will provide situational awareness to all GPS-capable radios and allows output of situational data to external sub-systems like CAD and internal sub-systems such as BeOn devices. With In-band GPS, a radio provides GPS status updates when the radio transmits. Harris will provide the StatusAware feature and provide Washoe County with 50 licenses. Mapping software, if required, is the responsibility of Washoe County.

A centralized management solution located on the Washoe County VIDA Premier Core will allow common management of the Washoe County Core and other Members Cores. With multiple management priority levels available, Washoe County can determine which level of access is appropriate for each user ID. Harris will provide Washoe County with one VIDA Management Terminal located at the primary VIDA Premier/Connect Core. Each Washoe County Core will be housed in a seismic- Zone-4 rated 84" cabinet.

INTEROPERABILITY

The VIDA architecture will give Washoe County the ability to address interoperability at the network, system and radio to radio levels. Harris will provide the following interoperability elements as part of the P25 radio system.

ISSI GATEWAY

The Inter-RF Subsystem Interface (ISSI) provides P25 TIA-standardized network-level communication between P25 radio systems, regardless of system manufacturer, and the VIDA radio system. The ISSI server for Washoe County and NSRS will be virtualized in the VIDA Application Server (VAS) located on the Las Vegas VIDA Premier Core. Its primary functions will be to manage calls, entity tracking, and registration between the local VIDA system and other RF Subsystems (RFSSs). In addition to inter-system communication, the ISSI service will provide the interface that enables radios to roam between systems. The system will support additional connections by adding another ISSI server to the radio system.

The ISSI will be configured to support four separate system interface connections. One is for the CSSI and 3 are for the ISSI. Each of the four ISSIs will be licensed to support 20 simultaneous talkpaths. Connections and integration services to external systems is not included in this contract. Harris will quote a scope of services to connect the VIDA P25 system to another system upon request once Washoe and NSRS identifies those systems and the scope of integration. Please note, connectivity, licenses, and any other related equipment which

must be purchased by the foreign system is the responsibility of NDOT. The ISSI interface to a foreign system does not include support for EDACS talkgroups.

CSSI GATEWAY

CSSI is a function of the ISSI application and will connect to a corresponding 3rd party infrastructure CSSI to allow use of 3rd party consoles. One gateway will be required at the system VIDA Premier Core and another is required at the corresponding agency dispatch center along with a core or control point to interface into the VIDA network. The CSSI will be located on the Las Vegas SANS VIDA Premier Core.

The CSSI will be designed to support 75 consoles from other manufacturers. Each CSSI server will require an external connection license. Harris will quote a scope of services to connect the CSSI to 3rd party consoles upon request once Washoe and NSRS identifies those consoles, locations and the scope of integration.

EDACS MIGRATION GATEWAY

The EDACS Migration Gateway (EMG) will provide integration between the existing EDACS system and the P25 Phase 1/Phase 2 system during transition. NDOT's new 24-channel, EDACS Migration Gateway and Washoe County's recently purchased EDACS Migration Gateway, will be used during cutover. NDOT's EMG will be housed at the Primary VIDA Premier location in the south and Washoe County's EMG will be housed at the secondary VIDA Premier location in the north. Both EMGs will be used to align with the migration plan and the user transition phases.

INTEROPERABILITY GATEWAY

Harris will provide an Interoperability Gateway at each of Washoe's 15 RF sites. Each gateway will support 8 interfaces. The Interoperability Gateway will provide a basic level of interoperability on the P25 radio system, permitting system-level audio connectivity with legacy trunked and conventional analog radio systems, regardless of manufacturer or frequency band. The Interop Gateway in Figure 4, will be configured to support conventional 4-wire E&M resources to interconnect with other devices.

Each gateway chassis can support up to 12 interfaces. In addition, Interop Gateways are also located at the VIDA Premier/Connect Core – South at the NDOT FAST Center. Harris has included a total of 36 interfaces for conventional resources located throughout the state. Please

note, gateways or the radio resources which provide the RF access must be within the coverage of the radio sites or systems they are intended to bridge. The gateways will be housed in open equipment racks having a seismic-Zone-4-rating and share the VIDA Core networking equipment. Members are responsible for backhaul to these gateways.

Figure 4. VIDA Interoperability Gateway Chassis

Site Design

The Washoe County system design includes P25 trunked multicast sites and P25 simulcast systems. Total number of P25 sites is 15.

The selection of RF sites for the P25 system is the foundation upon which coverage, system efficiency and cost effectiveness are built. Harris leveraged 10 existing sites to maintain coverage and added 5 new sites to improve coverage in challenging areas as identified. The five new candidate sites are listed below. The final site list is in the Site Details attachment, Exhibit 1a.

All 5 new candidate sites require FAA filing due to proximity to local airports. They are listed below. Washoe County will fill out and submit all documentation required for FAA filing.

- 49 Mtn
- Red Rock
- Smokey Quartz
- Truckee Station 18
- Yellow Peak

Using the existing EDACS sites' licenses as a guide, Harris optimized the coverage design to achieve maximum licensable ERP where possible and maintain a path-balanced system design. Every site will use tower-top amplifiers (TTA); however, Harris recommends its engineers and the engineers of the Washoe County revisit TTA use at all sites based on the real-world noise floor levels at each site. Harris will benchmark the noise floor at each site before installing

equipment. Any noise floor related issues identified before installation of Harris equipment will be handled as a change order.

Simulcast Cells

Harris' exclusive Distributed Control Point (DCP) technology virtualizes the simulcast control point application and removes all simulcast hardware requirements. Washoe County's four simulcast systems will employ redundant DCPs. The simulcast systems are listed below. The radio equipment is housed in 84-inch, seismic-Zone-4 rated open equipment racks. At Marble site, equipment will be housed in locking cabinets, seismic-Zone-4 rated.

- Washoe simulcast system - 3 sites, 16 channels
  - Peavine - DCP
  - Red Peak – DCP
  - Chimney Peak *(NV Energy-owned site)*
- Tahoe simulcast system - 2 sites, 8 channels
  - Biltmore – DCP
  - Snowflake – DCP
- South simulcast - 2 sites, 12 channels
  - Slide Mtn - DCP
  - Mount Rose - DCP
- Pyramid simulcast - 2 sites, 10 channels
  - Virginia Peak – DCP
  - Marble Bluff - DCP

The simulcast systems will be designed to minimize time delay interference or TDI and maximize coverage. Any TDI (also known as delay spread) is shown in pink. See simulcast maps below. The simulcast systems will be integrated to the VIDA Premier/Connect cores as depicted in Figure 2.

Figure 5. Metro Simulcast (Washoe County)

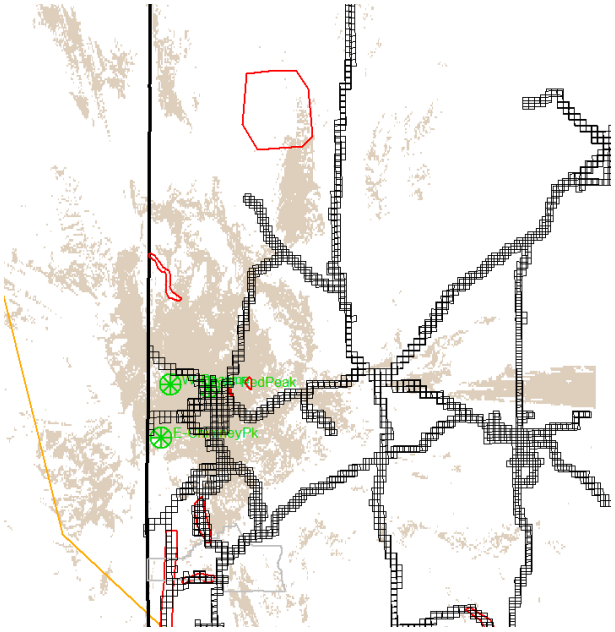


Figure 6. Tahoe Simulcast (Washoe County)

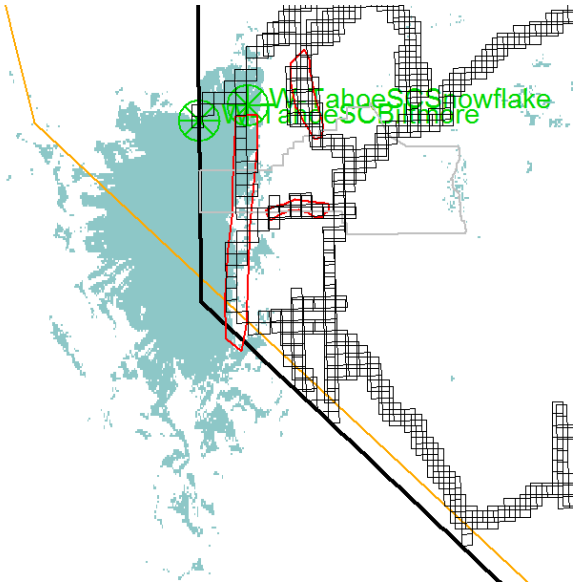


Figure 7. Slide Mtn and Mt Rose (Washoe County)

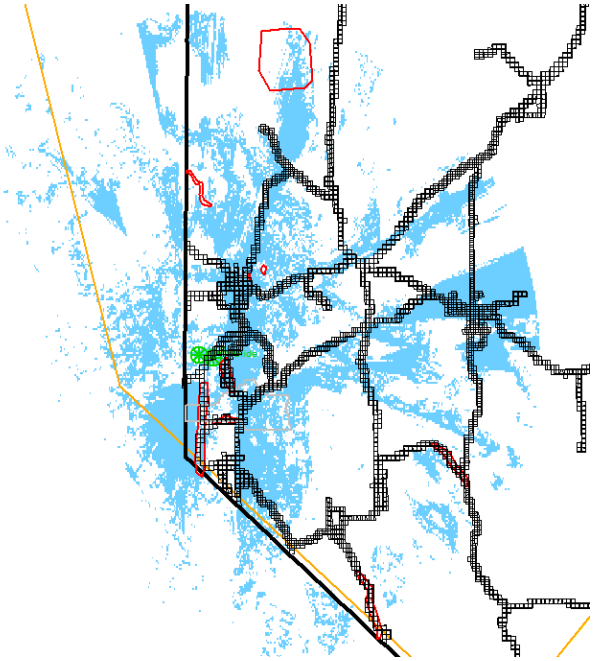
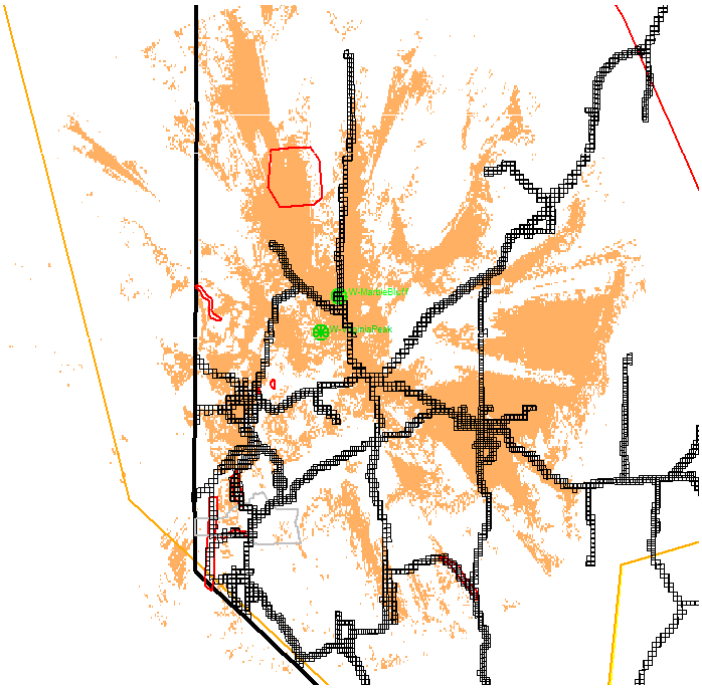


Figure 8. Virginia Peak and Marble Bluff (Washoe County)



The simulcast equipment is housed in 84-inch, seismic-Zone-4-rated, open, equipment racks.

Multisites

Seven multicast sites make up the remaining coverage for the Washoe County's portion of the NSRS system. The multisites are detailed in the Site Details attachment, Exhibit 1a. The equipment is housed in 84-inch, seismic-Zone-4-rated open equipment racks. At Poito site, equipment will be housed in locking cabinets rated for seismic-Zone-4. These sites will be integrated to the VIDA Premier/Connect cores as depicted in Figure 2

In-building Coverage

Harris will guarantee DAQ 3.4 coverage up to a level of 18 dB in the critical buildings listed in Figure 9. These buildings will be measured after a region has been placed into service. In the case where a building fails DAQ 3.4 testing, measurements will be taken both immediately around the building as well as inside the building in a small area centered on each failed test location. The building loss at a test location is defined as the difference between the mean of the outside measurements minus the 95th percentile of the inside measurements at the failed test location. The 95th percentile is the signal level that is exceeded by 95% of the measurements.

If the building loss is measured to be greater than 18 dB, Harris will quote the price to purchase and install BDAs at all necessary locations. Inbuilding coverage test details are in Exhibit 9 Coverage Character Test, Section 5.

Figure 9. Washoe County Critical Buildings

Building Name	Address	City	Number of Floors
Veterans Administration Hospital	975 Kirman Ave	Reno	unknown
Red Rock Volunteer Fire Station	16180 Red Rock Rd	Ranch Haven	1
FedEx Ground Building	12501 Mustang Rd	Sparks	1 (3-4 floors high)
Renown Regional Medical Center Emergency Room	1155 Mill St	Reno	unknown

Building Name	Address	City	Number of Floors
Nugget Casino Resort Victorias Steakhouse Restaurant	1100 Nugget Ave	Sparks	unknown
Saint Mary's Regional Medical Center	235 West 6th Street	Reno	unknown
Mendive Middle School	9100 Whitewood Drive	Sparks	unknown
Sparks Police Dept	1701 East Prater Way	Sparks	2
Ed Van Gorder Elementary School	7650 Campello Drive	Sparks	1

Site on Wheels (SOW)

Harris will integrate one 4 Channel P25 700 MHz site and associated antenna system into transportable units with attached tower or mast for deployment for special events and or emergency use. Harris equipment will be housed in an approved design to accommodate the heat load, air flow and rack layout requirements. An integrated DC rectifier and battery backup solution will supply -48 V DC to the P25 site equipment and other optional ancillary equipment. The DC battery system will be isolated in a separately enclosed cabinet.

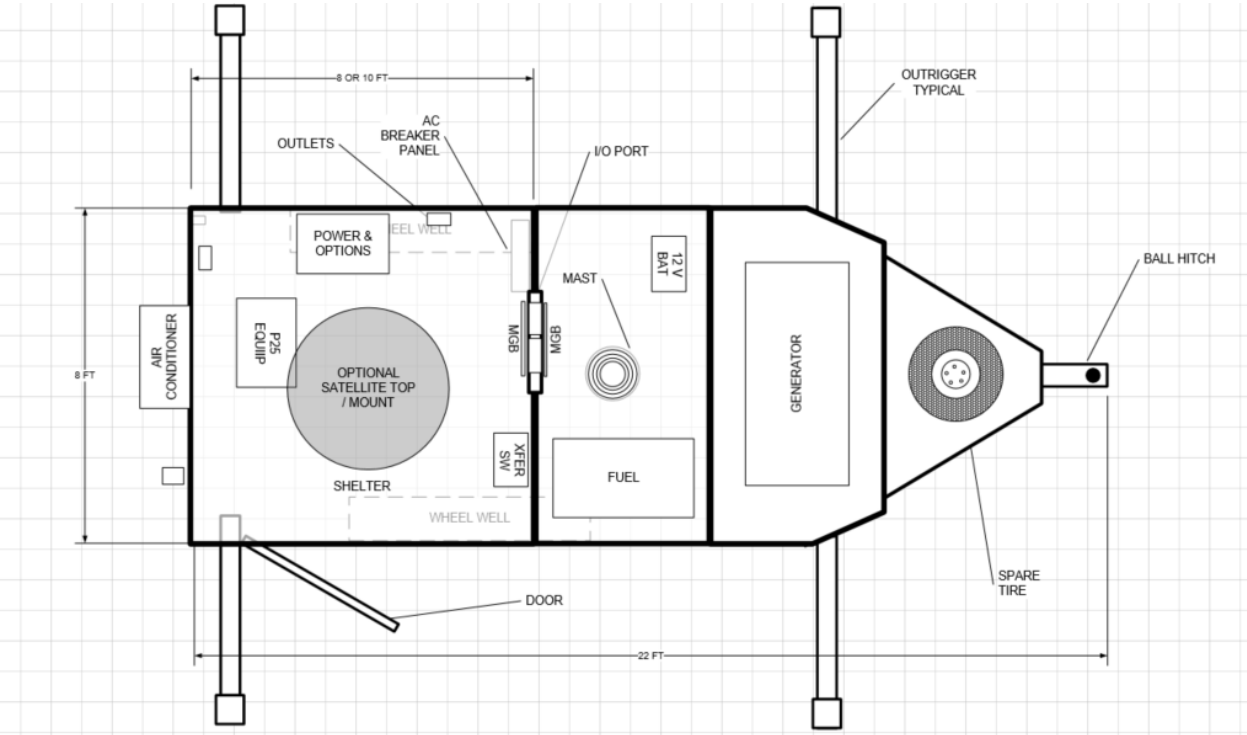
The main sub systems of the transportable tower site include the following:

1. Trailer
2. Portable Telescopic Tower
3. Antenna System
4. P25 4 Channel Site
5. Power and Generator
6. AC Cooling
7. Grounding System
8. Optional Microwave Antenna System

SOW Trailer and Enclosure Specifications

The general trailer construction will consist of a steel frame, dual axle, and enclosed cargo area capable of carrying an external deployable tower and all related equipment. Figure 10 is a representation of the transportable site trailer and equipment placement in the trailer.

Figure 10. Transportable Site Trailer



SOW MECHANICAL SPECIFICATIONS

Figure 11 lists the basic minimum requirements for a trailer and enclosure.

Figure 11. Trailer Mechanical Specifications

Specification Description	Minimum Requirement
Tower Type	MAST
Enclosed Size	~ 8 FT W x 8-10 FT L
Trailer Width Overall	~ 8.5 FT (TBD by Supplier)
Enclosure Interior height	7- 8 FT (TBD by Supplier)
Trailer Overall Length (w\o coupler)	~22 Ft
Trailer Gross Vehicle Weight (GCWR)	6500 Lbs (TBD by Supplier)
Trailer Gross Axle Weight (GAWR)	3500 Lbs (TBD by Supplier)
Trailer Approximate Shipping Weight	3500 Lbs (TBD by Supplier)
Number of Axles	2
Axel Capacity	3500 Lbs
Standard Coupler size	2-5/16 inch
Brakes	4 Wheel Electric
Tire Size	15 inches

Specification Description	Minimum Requirement
Tire Load Range	(TBD by Supplier)
Tire Capacity / Load Rating	1760 Lbs
Tire P.S.I	50
Wheel Rim Size	15 inches
Wheel Width	6 inches
Wheel Bolt Pattern	5.5
Anchoring System	Outrigger, Jack Posts

SOW ENCLOSURE REQUIREMENTS

The enclosed area will house electrical equipment and support the additional equipment that is required for system interoperability. Figure 12 lists the features that are specific for the trailer enclosure.

Figure 12. Enclosure Requirements

Specification Description	Minimum Requirement
Interior Floor	TBD by Supplier
Interior Wall Finish	White
Doors	Side Entrance
Exterior Top	Optional Satellite Mount
19 Inch Equipment Rack	Shock/Vibration Mount
Generator Storage	16 KW
Interior Electrical (See Power Section)	120 V AC
Interior Lighting	Yes
HVAC	Yes
Exterior Commercial Power Connection	Yes
Plenum / Cable Port	Yes
Grounding	Interior per Harris LMR Specification

SOW MOBILE TELESCOPING TOWER

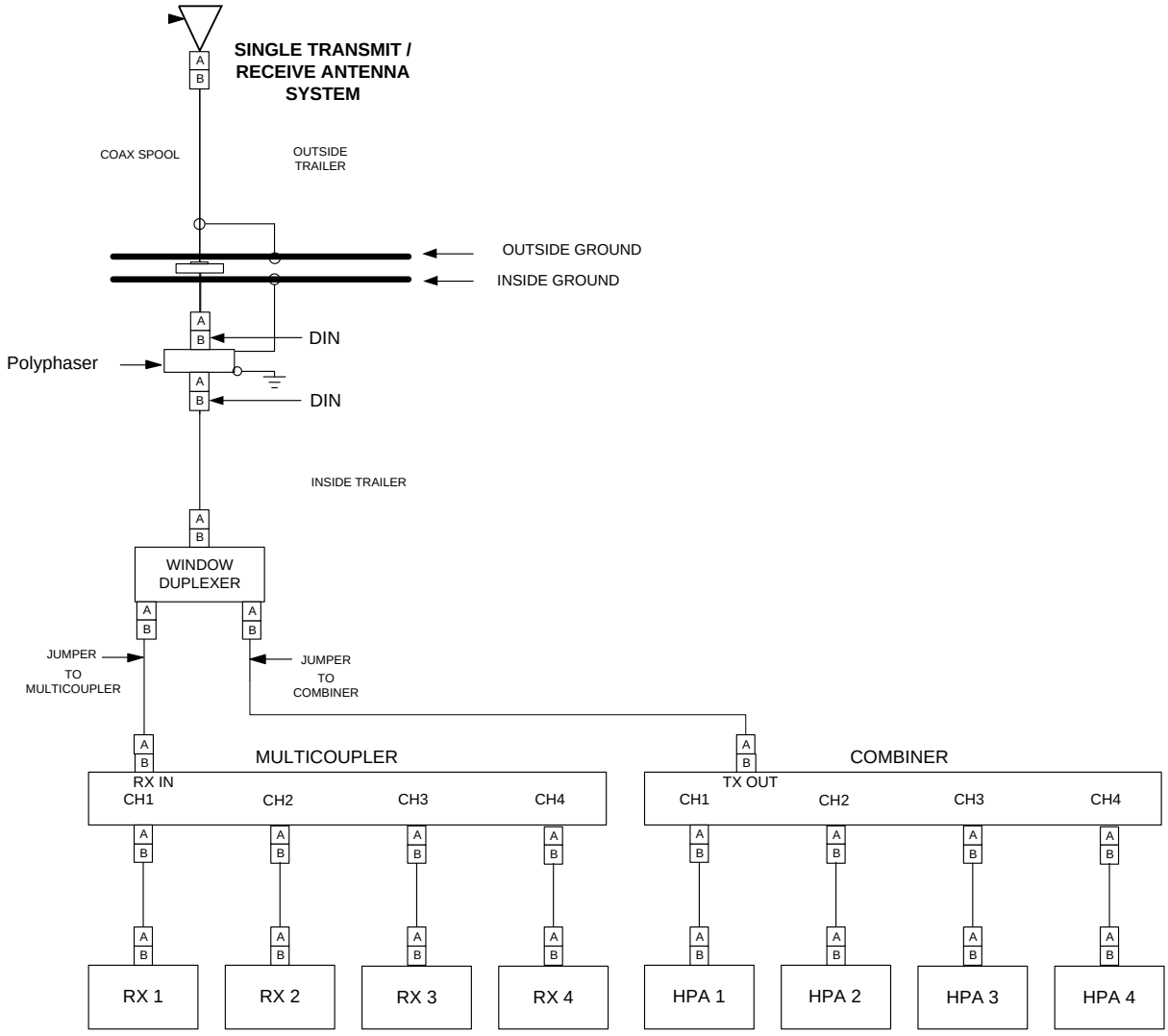
The transportable site will include a telescopic mast capable of extending to a height of approximately 60 feet. The tower will be fabricated from aluminum to provide light weight for on location setup. The tower will be composed of sections that collapse for storage and will be

mounted to the trailer enclosure for transporting. The mast will include self-furling coax feedline for connection to one LMR antenna mounted approximately at the center of the mast.

SOW ANTENNA SYSTEM

Due to transportable tower weight and wind restrictions it is desirable to keep the antenna system as light as possible. Harris will provide a single antenna mounted at the top of the tower for both transmit and receive. The antenna system pictured in Figure 13 will be connected to the repeaters located inside the trailer enclosure. Polyphasers are provided for lightening protection in combination with inside and outside ground bar when connected to a temporary ground system on location.

Figure 13. Antenna System Configuration



SOW P25 Site Equipment – 4 Channels

Harris will provide a 4-channel MASTR V base station for a single trailer. Channel hardware is modularized and has some special requirements for heat transfer and grounding to maintain FCC compliance and certification. Harris will integrate the P25 radio system into the enclosed trailer. The equipment rack includes the following equipment for a for fully trunked site operation:

1. Transceiver Chassis – consists of:
    a. Channel 1-4 Traffic Controller
    b. Channel 1-4 Baseband Module (2 required for 4 Channels)
    c. Channel 1-4 Receive Modules
    d. Channel 1-4 Transmit Modules
    e. Channel 1-4 Backplane Switch - primary
    f. Channel 1-4 Backplane Switch - secondary
2. High Power Amplifiers Section – consists of:
    a. Channel 1-4 High Power Amplifier Chassis
    b. Channel 1-4 High Power Amplifier
    c. Channel 1-4 Power Supplies (-48VDC)
3. Combiner Section – consists of:
    a. Channel 1-4 Ceramic Combiner
    b. Combiner Junction
    c. Optional Power Meter
4. Network and Ancillary Equipment – Consists of:
    a. CISCO Router
    b. CISCO Switch
    c. Network Sentry Alarm Monitor
    d. 10 MHz Reference
    e. Receiver Multi-coupler

f. Data Proxy (MME)

5. Power Distribution- consists of:

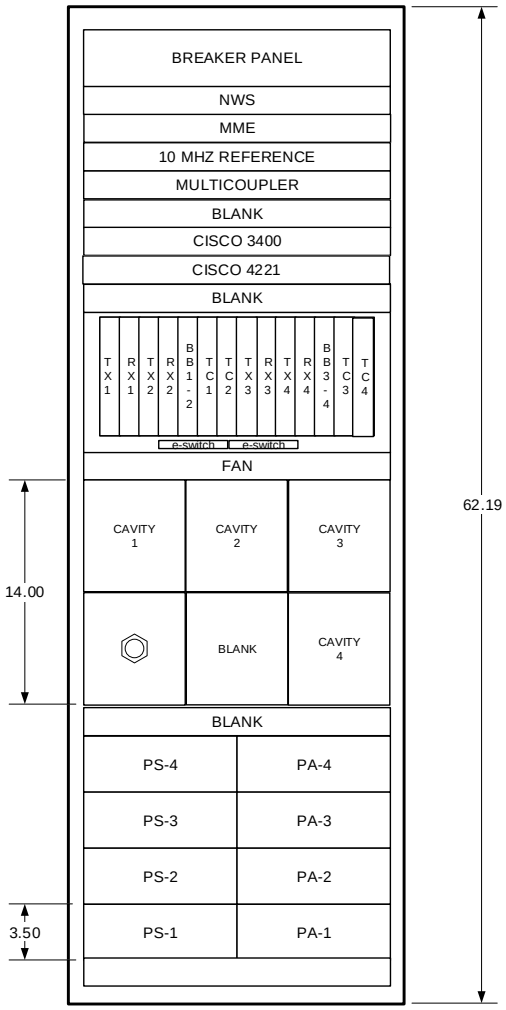
a. DC Breaker Panel

b. Power Block Wiring

SOW P25 SITE RACK

The P25 site rack in Figure 14 will contain all P25 related hardware and have a footprint of 24 inches wide by 24 inches deep. The height of the rack will be 72 inches maximum.

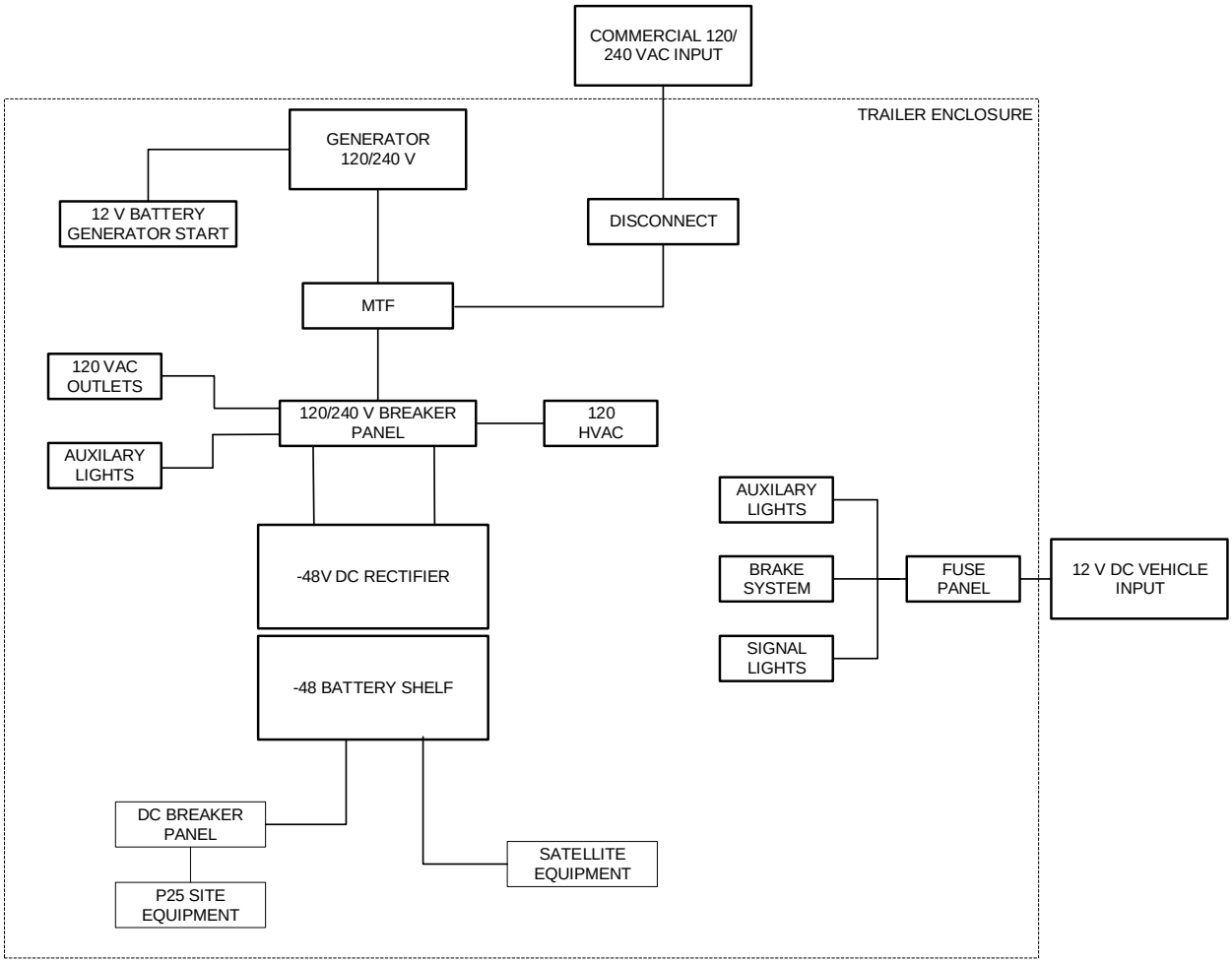
Figure 14. P25 Site Rack



SOW Power and Generator System

Harris recommends the transportable site operate for an extended period without connection to a commercial power source or without fuel for the auxiliary generator. The tiered backup power approach allows flexibility for different event locations. The fundamental power system will deliver both -48 VDC for the P25 site equipment and 120 VAC for auxiliary devices. The power distribution system will include surge suppression for commercial and generator power. A block diagram of the power system is shown in Figure 15.

Figure 15. Power and Generator System



SOW EQUIPMENT POWER REQUIREMENTS

Harris equipment will be powered by rectified AC input with -48V DC output. The remaining equipment listed below will be powered by -48 V DC. Backup DC power will be included in the rack with additional equipment required for the site. The equipment planned for the transportable site is listed in Figure 16.

Figure 16. P25 Site Equipment Power Requirements

Equipment	Voltage
Base Stations / Repeaters	-48V DC
MASTR V P25 Trunked	-48V DC
Misc RF Site Equipment	-48V DC
Network Sentry	-48V DC
MME SitePro	-48V DC
Cisco Router 4221	-48V DC
Cisco Switch 2960	-48V DC
MASTR V Fan Tray	-48V DC
Rx Multicoupler (8-channel)	-48V DC
Cabinet Fans	-48V DC
Brandywine Reference Oscillator	-48V DC
Microwave Equipment	-48V DC
MW Radio Equipment	-48V DC
Miscellaneous	-48V DC
HVAC System	120 V AC
Auxiliary Outlets	120 V AC

SOW -48 VDC PLANT POWER REQUIREMENTS

DC plant power requirements are in Figure 17.

Figure 17. DC Plant Power Requirements

Battery Recharge Time-Hours	24
Battery Run Time-Hours	.5
Battery Amp Hours	147
Battery re-charge Current	6.7
Rectifier Size-Load Amps	**80.2**

SOW 120 VAC REQUIREMENTS

AC power requirements are in Figure 18.

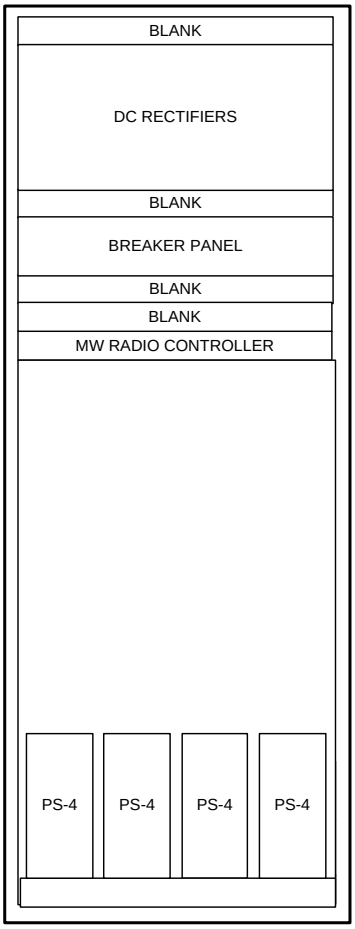
Figure 18. AC Equipment Power Requirements

120 V Equipment	2
Auxiliary Equipment Breaker (Amps)	15
HVAC Breaker (Amps)	20

SOW DC PLANT RACK

The DC Rack pictured in Figure 19 will have a footprint of 24 inches wide by 26 inches deep.

Figure 19. DC Plant Rack



SOW GENERATOR REQUIREMENTS

A Generator will provide power to all equipment at full load and provide power for the duration of the fuel supply. The Generator requirements to support the P25 site equipment, DC power plant and HVAC are listed in Figure 20.

Figure 20. Generator Requirements

Requirement	Rating
Generator Rating	16KW
Fuel Type	Propane
Voltage Output	120/240
Fuel Supply	80 Gal
Electric Start	12 VDC

SOW AIR CONDITIONING REQUIREMENTS

The AC system will provide cooling and heating for the enclosure space based on the heat load of the equipment. The requirements for cooling are in Figure 21 below.

Figure 21. Air Conditioning Requirements

Description	Requirement
Voltage	230 V
Width	50 inches
Depth	25 inches
Ambient Temperature	125° F
Enclosure Temperature Desired	75° F
Heat Load	3812 watts
Insulation	No
Location	Outside in direct Sunlight
Air Flow Conditions	Calm
Required Capacity	**1400 BTUH**

SOW GROUNDING SYSTEM

The grounding system will include interior and exterior ground principles according to the Harris grounding specification for sites. While this a transportable site, proper grounding is extremely important to provide safety for the equipment and any personnel within proximity of the trailer and tower. Temporary grounding posts at the location must be provided once the trailer location is established. All site grounding is the responsibility of Washoe County.

SOW MICROWAVE LINK

Harris will provide a Microwave link option to connect the transportable site to the VIDA Core. Because the endpoint locations are undefined, Harris has estimated a typical site to site link scenario. The microwave dish will be mounted on the trailer. Mounting and aligning a MW dish/radio on the transportable unit to a peer radio at a fixed location, would be difficult to setup

in most situations. Washoe County may want to consider a separate mount mast for the MW dish. Harris has included equipment for a generic link with positioning system for a point to point ethernet link for quick deployment. The microwave link includes the following:

1. MW radio for transportable site
2. MW radio for fixed peer location
3. Power allocation at transportable site
4. Integration at the transportable site

Integration and proper licensing of the MW radio or any backhaul connectivity at a peer location is not included and is the responsibility of Washoe County.

Nevada Dispatch Interconnect Project

Nevada Dispatch Interconnect Project (NDIP) consists of 31 locations across the state of Nevada. Twenty-four locations have existing Interoperability Gateway equipment and older model routers and switches. These sites will be included in this project scope. Harris will reconfigure the NDIP equipment currently connected to the existing VIDA Core into the new VIDA Core. Harris will provide new switches and redundant routers at 24 locations as identified below:

- Douglas County
- Carson City
- Lyon County
- Storey County
- Lander County
- Mineral County
- Pershing County

The following locations are configured on the existing VIDA Core and connected via gateways at the FAST Center in Las Vegas to SNACC.

- LVMPD
- FAO

- Henderson
- North Las Vegas
- Mesquite
- Nellis AFB
- Clark County

The following locations are supported by a talkgroup directly connected to existing NSRS/WCRCS core:

- Reno
- NHP Carson
- NHP Elko
- NHP Las Vegas
- NDOT District I
- NDOT District II
- NDOT District III
- Elko County
- Washoe County
- Sparks

Harris will perform the following services for each NDIP location:

- New IP scheme on existing equipment
- New configs for existing gateway equipment
- Move talkgroups from current Core to new Core
- Add talkgroups to new Core

Site Equipment

The MASTR V base stations will operate in both the simulcast and multicast systems at the radio sites. They will support P25 Phase 1 (FDMA) and P25 Phase 2 (TDMA) trunking operations. All base station equipment and antenna combining equipment will be housed in 84-inch, seismic-Zone-4-rated, open-equipment racks.

Harris will furnish and install new antenna system equipment (antenna, transmission line, transmitter combiners, receiver multicouplers, TTAs, and connectors) for all P25-Trunked RF sites. Harris will source all RF materials from suppliers, including transmission line of appropriate length. The P25 site configuration is in the Site Details attachment, Exhibit 1a.

Cross Band Repeater System

NCRN VHF to 800 MHz cross-band repeater equipment owned by NDOT will reside at Washoe's Peavine and Poito sites. It is assumed the P25 channels at Poito will be 800 MHz. There are 3 additional 800 MHz conventional channels at Peavine. The 800 MHz NCRN and conventional stations at Peavine will be incorporated into the P25 antenna system. The existing antenna system supports 700 MHz. For antenna system consolidation, the coverage maps at the Peavine site have been re-run with additional insertion loss due to incorporating a diplexer into the design. Harris will provide one receive antenna.

Network Management Systems

Harris will provide a solid Unified Network Management System (UNMS) that enables monitoring, control and configuration of P25 trunked and conventional communication systems with high availability and performance. The Network Sentry (NWS) will monitor and alert the status of site equipment and facilities to the Regional Network Manager (RNM). The RNM will monitor network utilization, performance, health, consolidates the region wide alarm information and report it to the Enterprise Network Manager (ENM). The ENM and other applications in the UNMS suite will provide a comprehensive system. The UNMS will host the following applications on Virtual Access Server(VAS) located on the NDOT VIDA Premier Core:

- Enterprise Network Manager (ENM)
- Unified Administrative System (UAS)
- Activity Warehouse

Harris will provide each Premier and Connect core with a Device Manager license for its RSM Pro. The entire NSRS system includes 6 Device Managers. Washoe County will be able to remote into the RSM pro to run Device Manager.

Unified Network Management System

The ENM and UAS web interfaces will support 50 concurrent sessions across the network and will be protected by role-based authentication defined on the Microsoft Active Directory server. Network monitoring applications support SNMP V2c and V3 for secured communications.
The following applications are available on a per user license basis:

- Radio Personality Manager 2 (RPM2)
- Profile Manager

Harris will provide Washoe County 4 each of these licenses.

Figure 22. List of Features and Harris' Offerings

Requirement	Harris Offering
Monitor health, keep alive, failures of all network devices. Generate statistical reports, interrogate, troubleshoot and maintain network components, send control commands, optimize performance.	Enterprise Network Manager (ENM)
Paging and email notifications.	ENM / Regional Network Manager (RNM)
Configure components, backup and restore configuration remotely.	Device Manager & Console(DMC) and Radio Personality Manager 2 (RPM2)
Push updates to remote equipment and upgrade if necessary	DMC
Manage encryption capabilities and over-the-air features	Unified Administrative System (UAS)
Manage intersystem interoperability	ISSI
Local administration database	UAS
Real-time airtime usage, site affiliations	Activity Warehouse, RNM
Real-time monitoring of network usage, network elements, GPS system, external interface detection	ENM/ RNM

Network Management Terminal (NMT)

Harris will provide 10 Network Management Terminals (NMT), at locations provided below. Network connections will be provided by Washoe County at the time of installation.

1. Washoe County – 10
    a. Edison – 7
    b. Spectrum - 3

Each NMT will be comprised of a PC running Windows OS, a monitor, keyboard and mouse. The NMT is configured to operate on the local network at the specified location. Each terminal will be attached to the Active Directory domain with the proper machine credentials and varying

levels of operator privileges. The NMTs will have necessary licenses and permissions to access the entire suite of management applications.

Network Management Systems – Asset Management

Harris will upgrade Washoe County's existing Asset Management System from MCM to include ID Management. ID Management is a dynamic radio ID management utility that will reside on Washoe County's existing CommSHOP 360 Asset & Work Order Management Solution. MCM's ID Management Enhancement App is designed to automate and streamline the radio ID management process.

The integration between the asset management system and Harris' VIDA system will occur in the Unified Administration System (UAS). The UAS will support a Bulk Import tool to allow the administrator to import data (such as users) to external applications. The UAS will support an User Export function from the user interface to export data to external applications.

Washoe County has agreed to use the existing asset management to VIDA system integration until automated integration becomes available. Automated integration between the asset management system and Harris VIDA system will be supplied on a later software release.

Remote Terminal Unit (RTU)

Harris VIDA Network Sentry(**NWS**) hosts site management services for controlling, managing and reporting site alarms and faults to the Regional Network Manager (RNM) and other external management systems via SNMP. Site network devices such as routers and switches report status information to the RNM providing an overall picture of the network. NWS downloads, maintains and distributes the database provisions to the site devices; archives and reports site call activity to the Regional Site Manager (RSM). The NWS is fully compatible with NMT and NMS, presenting a detailed snapshot of monitored devices, enabling technicians to make quick decisions.

The NWS is equipped with an array of digital Inputs, (expandable to 256 with additional hardware), digital outputs and analog inputs. These I/O (input/output) points can be configured to monitor various non-P25 devices such as RF Sensors, temperature alarms, doors, tower

beacons, antenna systems, etc. The cross-connect panel is at the back of the rack with punch-blocks simplifying installation, testing and maintenance for the operators. It synchronizes time with system domain clock through AD policies. NWS' at every site create a flexible work environment and help improve efficiency and productivity.

Microwave System

Harris will design and implement the new Washoe County microwave network that will provide high-speed wireless Ethernet transmission via the Nokia 7705 SAR-8 MPLS router installed at each Washoe County site. The new Washoe County microwave network will interconnect with the NDOT microwave network to form the NSRS. Harris will perform all services to implement all new equipment that includes microwave dishes, waveguide, radios, dehydrators, Network Management System and MPLS routers to provide network connectivity between the RF sites, cores, and existing PSAPs in Washoe County.

Harris has reviewed the existing Comsearch Microwave Path Data Sheet provided by Washoe County and have used this data along with the selected RF sites in Washoe County to provide a microwave backhaul network solution that will interconnect to the NDOT microwave network which forms the NSRS. The new Washoe County microwave network solution comprises of 22 links which is a combination of loop-protected microwave links and monitor hot standby (MHSB) links. These links will interconnect the cores, RF sites and PSAPs to the NSRS.

Each link will be designed with a path availability of 99.999% based on the receive threshold to provide the required link bandwidth. The new Washoe County microwave network will include the Nokia 7705 SAR-8 MPLS router for routing all packets between microwave sites, core locations and between NDOT and Washoe County microwave networks. In the event of a microwave path failure within the microwave loop, the 7705 SAR-8 will automatically reroute traffic to the opposite direction of the network. For RF sites that are connected by microwave spurs, a 1+1 MHSB radio will be installed to increase the reliability of the link.

Harris has designed the microwave network based on the topology provided in Figure 23 below. Figure 24 and Figure 25 provide a closer view of the microwave topology details. The main microwave loop for interconnecting the two core sites in Washoe County consist of links that will support a minimum of 161 Mbps. The two cores are located at the EOC Dispatch and Edison Way locations. The northern loop and all spur sites will have links that support a minimum of 22

Mbps. The Washoe County microwave network will interconnect with the NDOT microwave solution which share network nodes at Peavine Mtn and Virginia Peak site locations. Harris will coordinate with NDOT to support the routing of packets between the cores, RF sites and PSAPs located on the Washoe County side and the NDOT side of the NSRS.

Figure 23. Overall Microwave Topology

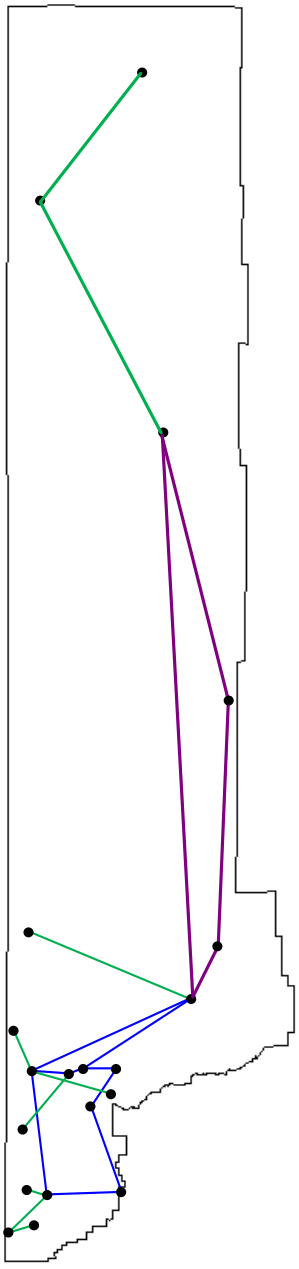


Figure 24. Microwave Topology Part A

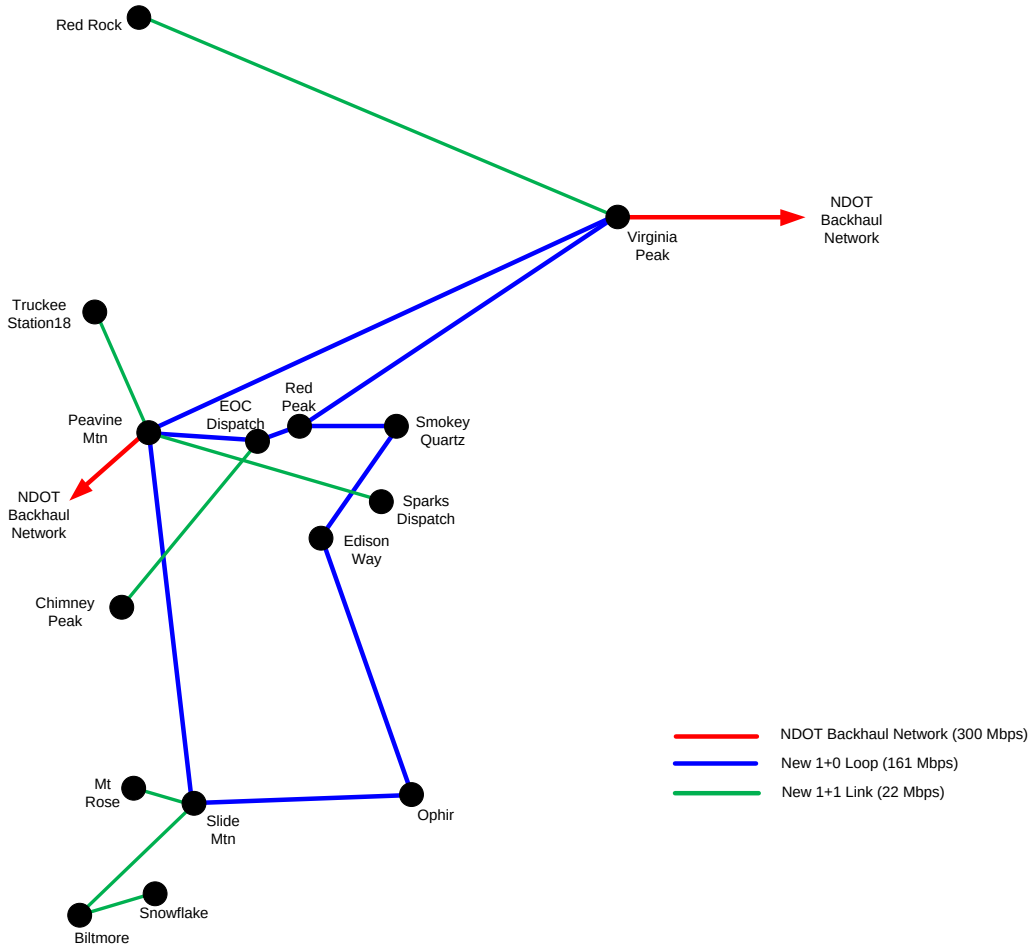
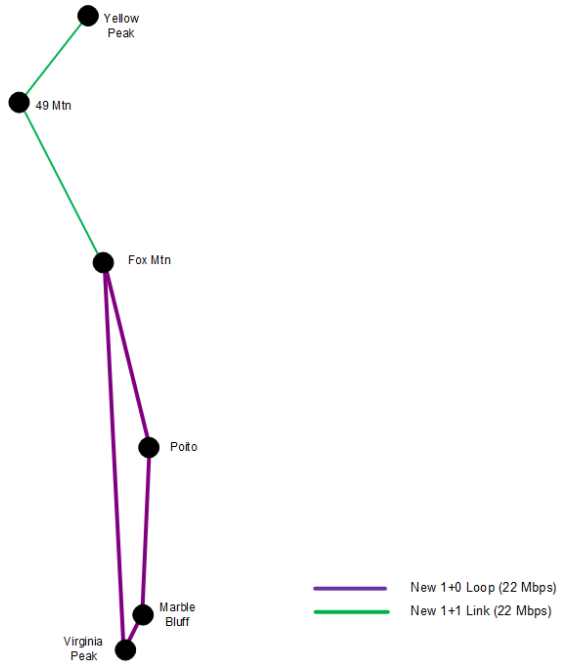


Figure 25. Microwave Topology Part B



The existing microwave links in Washoe County were considered and are based mainly on Nokia (formerly Alcatel) DS1 microwave circuits. Analysis of the existing microwave paths that will be reused are limited in bandwidth due to the nature of the existing DS1 signaling and will need to be replaced with all new Ethernet based radios to meet the NSRS bandwidth requirements. The existing DS1 links will remain operational until full cutover to the new NSRS. At that point, the equipment for ten existing links that are being replaced will be removed only.

Dispatch Console System

The Symphony Console consists of two components - the Symphony Dispatch Platform (SDP) and the Symphony application. The SDP is a Windows 10, Intel i7-based industrial grade computer with an integrated custom audio processor that supports 24-hour dispatch operations.

Dispatch Equipment

SYMPHONY DISPATCH PLATFORM

Figure 26 shows the main hardware component of Symphony. The SDP is fully IP-based and connects directly to the redundant radio network core using redundant Ethernet interfaces.

Figure 26. Symphony Dispatch Platform

Washoe County will receive 12 new Symphony consoles at five locations across the State of Nevada as listed below in Figure 27. Twenty-seven existing Symphony consoles will be upgraded to Windows 10.

Figure 27. Dispatch Locations

Location	Total Positions	Existing Symphony Consoles Upgrade to Windows 10	New Symphony Consoles required	Core Assignment
Washoe/Reno	16	15	1	North
Sparks	6	6	0	North
Washoe Co Detention	2	0	2	North
Court Complex	1	0	1	North
Washoe Co School District	7	1	6	North
Airport	4	4	0	North
WCRCS	3	1	2	North

Each new dispatch console will include the following:

- Symphony Dispatch Platform (SDP) - Premier Bundle. This includes a local screen and baton, 8 patch activations, 16 patch definitions, 16 simulselect definitions, I-calls, four user setups, 16 workspace tabs, 12 flexpaths, and a remote Baton.
- Integrated Instant Recall Recorder for playback independent of the logging recorder
- Call Director Telephone Interface
- AES-256 Encryption and DES-64 Encryption
- Conventional Controls
- Marker Tone
- 2 speakers
- 21.5” full HD monitor (other monitor options available)
- 104-key keyboard
- Standard mouse
- Two single heavy-duty footswitches (Operator and Supervisor)
- Standard desk microphone
- Two headsets (Operator and Supervisor)
- Two headset jack boxes with adapters (Operator and Supervisor)

Figure 28. Typical Symphony Console Position

Each dispatch location has redundant routers and redundant network interface cards (NICs).

Control Stations

Twenty dispatchers will have backup control stations connected to the Symphony console. Backup control stations allow dispatchers to continue dispatch operations during a loss of connectivity from the SDP to the VIDA Premier/Connect core switch. The PTT and audio signals from the desk microphone, headset, speakers, and footswitch sum and route to the radio in backup mode. The three-position Backup Radio switch located on the front of the Symphony Dispatch Platform is used to select from the following choices:

- **Auto:** The Backup Radio is in an active or inactive state controlled automatically by the console.
- **Disable:** The Backup Radio is disabled and cannot be turned on by the console.
- **Manual:** The Backup Radio control is enabled if the radio is powered on.

Two of the stations are existing and will be upgraded accordingly with the following feature set.

- CS7000 (M7300) – P25 Trunking, LLA, TDMA
- M7300 DCS – P25 Trunking, LLA, TDMA

Harris will provide 114 new CS7000 (XG-75M) control stations. Ninety-four stations will be locally controlled and non-encrypted. Twenty stations will be remotely controlled by the Symphony console include AES encryption. All control stations will be configured with the following public safety features:

94 Local Control Stations (Non-Public Safety)

- LLA
- TDMA
- P25T
- OTAP
- EDACS
- System CH-721 Control Head
- MAX SYSGRPS

20 Local Control Stations (Public Safety)

- LLA
- TDMA
- P25T
- OTAP
- OTAR
- EDACS
- System CH-721 Control Head
- ProVoice
- Multikey AES Encryption
- MAX SYSGRPS

Voice Logging Recorder and Interface

Overview

Harris will provide Washoe County and Washoe County School District with Exacom Hindsight-600, Multi Media Recording platform P25 Phase 2-compatible logging recorders to record all trunked radio traffic, all conventional radio traffic, all 911 trunks, and call taker administrative calls.

Voice Logging Recorder Equipment

For Washoe County, the Hindsight-600 provides a solution based on 2 redundant 176 channel recording servers (Dell T-640), each with 144 IP channels for Harris P25 audio and data, 32 analog channels and 6 TB of storage that is RAID 5. The servers will simultaneously record all Harris P25 vocoded communications and In-band GPS data. Once these recordings have been captured by the redundant recorders, the recordings will be stored in the core location recording servers as well as be made available for the Access Server that provide Washoe County the ability to search, playback and save P25 audio and data. The Access server will assist with incident recreation and playback of recorded calls for complete incident recreation. It is important to note that radio recording access will be administered and governed by the local system administrator and users will have permissions and access provided by the system administrator.

For Washoe County School District, the logging recorder solution is based on 2 redundant 80 channel recording servers (Dell T-640), each with 48 IP channels for Harris P25 audio and data, 32 analog channels and 3 TB of storage that is RAID 5. The servers will simultaneously record all Harris P25 vocoded communications. Once these recordings have been captured by the redundant recorders, the recordings will be stored in the core location recording servers as well as be made available for the Access Server that provide Washoe County School District the ability to search, playback and save P25 audio and data. The Access server will assist with incident recreation and playback of all calls for complete incident recreation. It is important to note that radio recording access will be administered and governed by the local system administrator and users will have permissions and access provided by the system administrator.

The Hindsight-600 is EIA/TIA 19" rack-mountable. It will meet or exceed all FCC, IEEE, EIA/TIA, NENA, and APCO standards. All sites feature a NAS device for backup storage for each of the recording servers. All sites have client licenses associated with the Access Server.

Equipment Reuse

Washoe County has an existing 2-site, 4-channel, 700 MHz P25 simulcast system at Peavine and Red Peak. In the new P25 system these sites are part of a 3-site, 16 channel simulcast system. These sites will undergo hardware and software upgrades. Twelve MASTR V stations will be added to each site to go from 4 channels to 16 channels. Existing site routers and switches will be replaced with newer Cisco 4000 series routers and switches. The following existing assets will be used in the new P25 radio communication system as indicated.

- Peavine site equipment, 700 MHz P25 simulcast
  - 4 channel MASTR V station
  - Existing racks
  - DCP
  - Network Sentry

Antennas, combiners, receiver multicoupler and tower amplifier equipment will be replaced.

- Red Peak site equipment, 700 MHz P25 simulcast
  - 4 channel MASTR V station
  - Existing racks
  - DCP
  - Network Sentry

Antennas, combiners, receiver multicoupler and tower amplifier equipment will be replaced.

Washoe County recently purchased a redundant EDACS Migration Gateway. This gateway will be used to transition EDACS users from the existing EDACS system to the new P25 radio system. Please note this new gateway will need new licenses.

The following is a list of additional existing equipment and/or licenses that will be reused in the new P25 radio system.

- Existing BeOn client licenses
- Existing Symphony console & talkpath licenses will be transferred to the new Core.
- Existing Peavine/Red Peak P25 simulcast system talkpath and site licenses
- Existing Interoperability Gateway and associated licenses
- Existing KMF licenses
- Existing Logging Recorder licenses attached to an existing Verint logging recorder will be transferred to the new system when the Verint recorder is transferred to the new radio system. Harris will provide a quote for equipment and services to connect the existing Verint logging recorder to the new P25 VIDA Core when requested by Washoe County

Non-Harris equipment and licenses are not transferrable to the new system. See list below.

- Existing Syslog Server

Subscriber Equipment

User Radio Equipment

All radios will be software-programmable and configurable to match the mission, needs, and budget of each user agency. Many of the existing models, like the XG-series mobiles and portables, will continue to be compatible with the new P25 system and are P25 Phase 2 upgradeable. All Harris portable and legacy mobile radios are certified to meet FCC PART 90 and environmentally tested to MIL-STD 810G. All new radios will feature link layer authentication.

Harris will provide radio models as identified below and in Exhibit 6 SOW Pricing Schedule. The Price Schedule supersedes the radio information in the 'Copy of Terminals_WCRCS' Excel file provided by Washoe County. New radios include Public Safety and Non-Public Safety mobile and portable radios and desktop control stations. Desktop stations are locally controlled and will be installed at the desk.

Portable Radios:

- XL- 200P
- XL-185P
- XG-75Pe
- XG-25P
- XG-15P

Mobile Radios:

- XL-200M
- XG-75M
- XG-25M

Control Stations – local control

- XG-75M

The following radios requested by Washoe are outside Harris' original proposal and may not have support for the RFP mandated 4-year support requirement.

- XG-100M
- XG-75Pe
- XG-15P

Upgrade Radios

Harris will upgrade the radios as listed in Exhibit 6 SOW Pricing Schedule. EDACS is assumed to be an existing feature on all radios. P25 Trunking feature is required for a radio to have the features listed below. P25 Trunking feature will be provided at no charge to any upgrade radio requiring the following feature upgrades:

- LLA
- TDMA
- OTAR
- AES
- Profile

The P25 trunking feature only includes P25 trunking.

Spares – Infrastructure Equipment

Spare equipment housed locally by Washoe County will be used to quickly replace failed equipment components. Please see Exhibit 5 Equipment List SOW for details. As instructed by Washoe County, spares will be included as follows:

- 1 – 10 Channel Combiner
- 1 – 8 Port Receiver Multicoupler
- 1 – 16 Port Receiver Multicoupler
- 1 – 24 Port Receiver Multicoupler
- 1 – Tower Top Amplifier
- 1 – Each, make & model of RF site antennas
- 2 – Each, make & model of site surge suppression
- 1 – 4 Channel MASTR V, 700 MHz
- 1 – 4 Channel MASTR V, 800 MHz
- 2 – MASTR V -48VDC Power Supplies

- 2 – MASTR V Linear Power Amps, 700 MHz
- 2 – MASTR V Linear Power Amps, 800 MHz
- 1 – Interoperability Gateway, 36 interfaces
- 4 – Interoperability Gateway AC Power Supplies
- 4 – Interoperability Gateway 48VDC Power Supplies
- 1 – Netclock GPS Master Clock
- 1 – NSC Premier Server
- 2 – Power Sensor, 403-1000MHz
- 1 – Network Sentry IP Simulcast DC powered
- 1 – Network Sentry IP Multicast DC powered
- 2 – Assembly Controller, SitePro, MME w/cables, DC powered, additional site/channel
- 1 – MASTR V IP Simulcast, TX site, Common Equipment
- 3 – Oscillators, 10 MHz reference DC powered 6 ports
- 2 – VSCU3H Cisco 2960 Plus Switch, DC powered
- 1 – VSMA6N Mounting Kit, Hardware for Cisco 2960 MSTR III/V cabinet
- 1 – VSCN1J Unitrends ServerRS606 Backup Appliance
- 1 – VSCR28 1921 Advanced Security Router, AC powered
- 1 – VS-CR72 ISR4331 AX APP Router and Security LIC
- 1 – VS-CR90 ISR4321 Router with Security BDL License, DC powered
- 1 – VSCR29 1921 Advanced Security Router, DC powered
- 1 – VS-CU5C Cisco ME 3400E Switch, 24 ports, DC powered
- 1 – VS-CU6G Cisco EHWIC-4ESG 4-port GIG INT Module
- 2 – VS-CU7Y Module SFP GBIC

Harris is adding the following items as spares:

- 1 – VS-CR1G 4221 Site Router SEC/K9

- 1 – VS-CR1F 4221/K9 Router (Dispatch locations)
- 1 – VS-CR92 3650 Switch Catalyst, 24 ports, IP
- 1 – VS-CU5H Cisco SX Multimode Fiber Module
- 6 – VS-CR1H Nokia Router

NSRS Sites by Entity

127 Sites, 101 Existing sites, 26 New Candidate sites (3 sites are being constructed by NDOT)
56 Sites - Region 1
38 Sites - Region 2
33 Sites - Region 3

	Member	Region	Core Assignment North or South	COUNTY	SITE NAME	STATE	CHS. P25 Phase 1 *Virtual Site	SITE TYPE
WASHOE COUNTY **2nd Half of VIDA Premier Core - Washoe NOC** **VIDA Premier/Connect HA #2A -Washoe NOC** ***Note: NVE owns other half of VIDA Premier/Connect HA***								
1	WC	2	North	Washoe	Fox WCRCS	NV	5	Multi-site
2	WC	2	North	Washoe	Poito - WC	NV	6	Multi-site
3	WC	2	North	Washoe	Tahoe SC - Biltmore	NV	8	Simulcast Cell #1
4	WC	2	North	Washoe	Tahoe SC - Snowflake	NV	8	Simulcast Cell #1
5	WC	2	North	Washoe	Slide WCRCS	NV	12	Simulcast Cell #4
6	WC	2	North	Washoe	Rose WCRCS	NV	12	Simulcast Cell #4
7	WC	2	North	Washoe	Red Peak - Metro SC	NV	16	Simulcast Cell #3
8	WC	2	North	Washoe	Peavine - Metro SC	NV	16	Simulcast Cell #3
	NVE	2	North	Washoe	Chimney (NVE owned site)	NV	16	Simulcast Cell #3
9	WC	2	North	Washoe	Virginia Peak WCRCS	NV	10	Simulcast Cell #5
10	WC	2	North	Washoe	Marble Bluff WCRCS	NV	10	Simulcast Cell #5
11	WC	2	North	Washoe	New Site - Yellow Peak	NV	4	Multi-site
12	WC	2	North	Washoe	New Site - Smokey Quartz	NV	12	Multi-site
13	WC	2	North	Washoe	New Site - Red Rock	NV	4	Multi-site
14	WC	2	North	Washoe	New Site - 49 Mtn	NV	3	Multi-site
15	WC	2	North	Washoe	New Site - Truckee Station 18	NV	8	Multi-site
						TOTAL CHS	150	P25 Stations
							6	NCRN (800 MHz)
							156	Phase 1

SITE NAME	TX Antennas	TX Antenna Height	Combiner Size	Additional Equipment at site	Receiver Multicoupler Size	Rx Antenna Height	# of Racks	Latitude	Longitude	Site Elevation (ft)	Combiner	Combiner Channels
Fox WCRCS	1	35 ft	6 Ch Combiner	**Existing one 800 MHz conventional channel included in P25 antenna system.** Assumption is this site will be 800 MHz.	8 ports	50ft	3	41.025531	-119.558219	8163	DSCC85	5
Poito - WC	1	55 ft	10 Ch Combiner	**Existing Cross band repeaters - 3 VHF, 3-800 MHz, 800 MHz included in P25 antenna system.** Assumption is this site will be 800 MHz.	16 ports	70 ft	4+2	40.425989	-119.351661	5686	DSCC85	10
Tahoe SC - Biltmore	1	45 ft	8 Ch Combiner		8 ports	45 ft	3	39.227767	-120.004597	6405	DSCC85	8
Tahoe SC - Snowflake	1	55 ft	10 Ch Combiner	**Existing two 800 MHz conventional channel included in P25 antenna system.** Assumption is this site will be 800 MHz.	16 ports	55ft	3	39.247406	-119.922131	7431	DSCC85	8
Slide WCRCS	2	105 ft	2, 6 Ch Combiners		16 ports	120 ft	4	39.314558	-119.8842	9581	DSCC85	6
Rose WCRCS	2	65 ft	2, 7 Ch Combiners	**Existing single 800 MHz conventional channel included in P25 antenna system.** Assumption is this site will be 800 MHz.	16 ports	75ft	4	39.32325	-119.944194	10135	DSCC85	6
Red Peak - Metro SC	2	135ft	2, 10 Ch Combiners		24ports	150 ft	4	39.5837	-119.798925	5420	DSCC75	10
Peavine - Metro SC	2	85 ft	2, 8 Ch Combiners 1, 6 Ch Combiner, 800 MHz	**Existing Cross band repeaters - 3 VHF, 3-800 MHz, 3-800MHz conventional channels.** A diplexer will combine the 800 MHz frequencies into existing 700 MHz P25 antenna system.	24 ports	100 ft	4+2	39.589583	-119.928328	8209	DSCC75	10
Chimney (NVE owned site)	**1**	**35 ft**	**2, 10 Ch Combiner**		**24 ports**	**50 ft**	**4**					
Virginia Peak WCRCS	1	115 ft	10 Ch Combiner		16 ports	130 ft	4	39.755469	-119.463	8252	DSCC75	10
Marble Bluff WCRCS	1	115 ft	10 Ch Combiner		16 ports	132 ft	4	39.874086	-119.382858	4511	DSCC75	10
New Site - Yellow Peak	1	80 ft	4 Ch Combiner		8 ports	100 ft	3	41.835939	-119.624978	7139	DSCC75	4
New Site - Smokey Quartz	1	80 ft	2, 6 Ch Combiners		16 ports	100 ft	4	39.591667	-119.683056	5128	DSCC75	6
New Site - Red Rock	1	80 ft	4 Ch Combiner		8 ports	100 ft	3	39.906558	-119.945556	5200	DSCC75	4
New Site - 49 Mtn	1	80 ft	4 Ch Combiner		8 ports	100 ft	3	41.552036	-119.934678	7517	DSCC75	4
New Site - Truckee Station 18	1	80 ft	8 Ch Combiner		8 ports	100 ft	3	39.677925	-119.980242	5043	DSCC75	8

SITE NAME	Tx Ant Ht (ft)	Tx Ant Model	Tx Ant Gain (dBd)	Multicoupler	Tower Top Amp	Rx Ant Ht (ft)	Rx Ant Model	Rx Ant Gain(dBd)
Fox WCRCS	35	SC479-HF1LDF(E5608)(D02)	9	CP00921-6MHzAC	CP00732	50	SC412-HF2LDF(D01-E5608)	11.4
Poito - WC	55	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	70	SC412-HF2LDF(E5608)	11.4
Tahoe SC - Biltmore	45	SC432D-HF6LDF(D00-I40-G06)	6	CP00921-6MHzAC	CP00732	45	SC432D-HF6LDF(D00-I40-G06)	6
Tahoe SC - Snowflake	55	SC432D-HF6LDF(D00-I40-G06)	6	CP00921-6MHzAC	CP00732	55	SC432D-HF6LDF(D00-I40-G06)	6
Slide WCRCS	105	DS7C10F36U3N Vertical	9.9	CP00921-6MHzAC	CP00732	120	DS7C10F36U3N Vertical	9.9
Rose WCRCS	65	SE419-SWBPALDF(D08-E6461)_130D	9.9	CP00921-6MHzAC	CP00732	75	SE419-SWBPALDF(D08-E6461)_130D	9.9
Red Peak - Metro SC	135	DS7A0636U3N	6.5	CP00921-6MHzAC	CP00732	150	SC479-HF1LDF(E5608)(D02)	9
Peavine - Metro SC	85	SC479-HF1LDF(E5608)(D02)	9	CP00921-6MHzAC	CP00732	100	SC412-HF2LDF(D01-E5608)	11.4
Chimney (NVE owned site)								
Virginia Peak WCRCS	115	DS7A06F36U3N	6.5	CP00921-6MHzAC	CP00732	130	DS7C10F36U-N	10
Marble Bluff WCRCS	115	DS7A08F36U-N	8	CP00921-6MHzAC	CP00732	132	DS7C10F36U-N	10
New Site - Yellow Peak	80	DS7C10F36U3N Vertical	9.9	CP00921-6MHzAC	CP00732	100	DS7C10F36U3N Vertical	9.9
New Site - Smokey Quartz	80	DS7C10F36U3N Vertical	9.9	CP00921-6MHzAC	CP00732	100	SC412-HF2LDF(D01-E5608)	11.4
New Site - Red Rock	80	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	100	SC412-HF2LDF(E5608)	11.4
New Site - 49 Mtn	80	DS7A06F36U6N	6	CP00921-6MHzAC	CP00732	100	SC479-HF1LDF(D02-E5608)	9
New Site - Truckee Station 18	80	DS7A08F36U-N	8	CP00921-6MHzAC	CP00732	100	DS7C10F36U-N	10

SITE NAME	Rx Ant Gain (dBd Hzn)
Fox WCRCS	9.9
Poito - WC	11.4
Tahoe SC - Biltmore	6
Tahoe SC - Snowflake	6
Slide WCRCS	5.1
Rose WCRCS	5.1
Red Peak - Metro SC	7.8
Peavine - Metro SC	9.9
Chimney (NVE owned site)	
Virginia Peak WCRCS	10
Marble Bluff WCRCS	10
New Site - Yellow Peak	5.1
New Site - Smokey Quartz	9.9
New Site - Red Rock	11.4
New Site - 49 Mtn	7.8
New Site - Truckee Station 18	10

	Member	Region	Core Assignment North or South	COUNTY	SITE NAME	STATE	CHS. P25 Phase 1 *Virtual Site	SITE TYPE
NDOT **VIDA Premier HA Primary - Las Vegas SANS** **Primary VIDA Premier/Connect HA #1A - FAST Center, Las Vegas, Clark Co** **Secondary VIDA Premier/Connect #1B - Beltway, Las Vegas, Clark Co**							**88**	**FREQUENCIES**
1	**NDOT**	**3**	**North**	Elko	3-Mile	NV	5	Multi-site
2	**NDOT**	**1**	**South**	Lincoln	Alamo	NV	4	Multi-site
3	**NDOT**	**1**	**South**	Nye	Amargosa Valley	NV	4	Multi-site
4	**NDOT**	**3**	**North**	Lander	Austin	NV	4	Multi-site
5	**NDOT**	**2**	**North**	Mineral	Bald West	NV	5	Multi-site
6	**NDOT**	**3**	**North**	White Pine	Border Inn	NV	4	Multi-site
7	**NDOT**	**1**	**South**	Nye	Brock	NV	7	Multi-site
8	**NDOT**	**3**	**North**	White Pine	Buster	NV	4	Multi-site
9	**NDOT**	**1**	**South**	Lincoln	Caliente	NV	4	Multi-site
10	**NDOT**	**3**	**North**	White Pine	Cave	NV	5	Multi-site
11	**NDOT**	**1**	**South**	Clark	Coyote Springs	NV	**6**	Multi-site
12	**NDOT**	**1**	**South**	Nye	Currant Summit	NV	4	Multi-site
13	**NDOT**	**2**	**North**	Lyon	Eagle Ridge	NV	7	Multi-site
14	**NDOT**	**3**	**North**	Elko	Elko Mtn	NV	8	Multi-site
15	**NDOT**	**3**	**North**	Elko	Ellen Dee	NV	5	Multi-site
16	**NDOT**	**3**	**North**	Eureka	Emigrant	NV	4	Multi-site
17	**NDOT**	**2**	**North**	Churchill	Fairview Peak	NV	5	Multi-site

SITE NAME	TX Antennas	TX Antenna Height	Combiner Size	Additional Equipment at site	Receiver Multicoupler Size	Rx Antenna Height	# of Racks	Latitude	Longitude	Site Elevation (ft)	Combiner	Combiner Channels
3-Mile	1	25 ft	5 Ch Combiner	Future Cross band repeaters - 3 VHF, 3-800 MHz (not included in P25 antenna system)	8 ports	45 ft	2+2	40.748497	-114.098858	5086	DSCC75	5
Alamo	1	40 ft	4 Ch Combiner		8 ports	60 ft	2	37.344111	-115.257333	6158	DSCC75	4
Amargosa Valley	1	140 ft	4 Ch Combiner		8 ports	160 ft	2	36.540778	-116.437	2375	DSCC75	4
Austin	1	5 ft	4 Ch Combiner	**Existing Cross band repeaters - 3 VHF, 3-800 MHz (not included in P25 antenna system) RWIS**	8 ports	20 ft	2+2	39.453475	-117.054322	8432	DSCC75	4
Bald West	1	30 ft	5 Ch Combiner	**Existing Cross band repeaters - 3 VHF, 3-800 MHz (not included in P25antenna system)**	8 ports	50 ft	2+2	38.784447	-118.834381	9177	DSCC75	5
Border Inn	1	20 ft	4 Ch Combiner	**RWIS**	8 ports	40 ft	2	39.055372	-114.050758	5122	DSCC75	4
Brock	1	70 ft	7 Ch Combiner	**RWIS**	8 ports	90 ft	2	38.051678	-117.225983	7054	DSCC75	7
Buster	1	20 ft	4 Ch Combiner		8 ports	40 ft	2	39.368697	-115.470628	8337	DSCC75	4
Caliente	1	100 ft	4 Ch Combiner	Future Cross band repeaters - 3 VHF, 3-800 MHz (not included in P25antenna system)	8 ports	120 ft	2+2	37.600694	-114.509806	5171	DSCC75	4
Cave	1	45 ft	5 Ch Combiner	**Existing Cross band repeaters - 3 VHF, 3-800 MHz (not included in P25 antenna system) RWIS**	8 ports	65 ft	2+2	39.160817	-114.614942	10696	DSCC75	5
Coyote Springs	1	60 ft	6 Ch Combiner		8 ports	80 ft	2	36.810817	-114.956433	2644	DSCC75	6
Currant Summit	1	35 ft	4 Ch Combiner	Future Cross band repeaters - 3 VHF, 3-800 MHz (not included in P25 antenna system) RWIS	8 ports	55 ft	2+2	38.830264	-115.294475	7609	DSCC75	4
Eagle Ridge	1	40 ft	7 Ch Combiner	**Existing Cross band repeaters - 3 VHF, 3-800 MHz (not included in P25 antenna system)**	8 ports	60 ft	2+2	39.487764	-119.297569	6851	DSCC75	7
Elko Mtn	1	30 ft	8 Ch Combiner	**Existing Cross band repeaters - 3 VHF, 3-800 MHz (not included in P25 antenna system)**	8 ports	50 ft	2+2	40.894581	-115.630561	7454	DSCC75	8
Ellen Dee	1	40 ft	5 Ch Combiner	**Existing Cross band repeaters - 3 VHF, 3-800 MHz (not included in P25 antenna system) RWIS**	8 ports	60 ft	2+2	41.785017	-114.84045	8583	DSCC75	5
Emigrant	1	40 ft	4 Ch Combiner		8 ports	60 ft	2	40.654767	-116.274161	6149	DSCC75	4
Fairview Peak	1	5 ft	5 Ch Combiner	Future Cross band repeaters - 3 VHF, 3-800 MHz (not included in P25 ant sys)	8 ports	20 ft	2+2	39.225472	-118.152611	8275	DSCC75	5

SITE NAME	Tx Ant Ht (ft)	Tx Ant Model	Tx Ant Gain (dBd)	Multicoupler	Tower Top Amp	Rx Ant Ht (ft)	Rx Ant Model	Rx Ant Gain(dBd)
3-Mile	25	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	45	SC412-HF2LDF(E5608)	11.4
Alamo	40	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	60	SC412-HF2LDF(E5608)	11.4
Amargosa Valley	140	DS7A06F36U-N	8	CP00921-6MHzAC	CP00732	160	DS7A06F36U-N	6
Austin	5	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	20	SC412-HF2LDF(E5608)	11.4
Bald West	30	SC473-HF1LDF	3	CP00921-6MHzAC	CP00732	50	SC476-HF1LDF	6.1
Border Inn	20	DS7A08F36U-N	8	CP00921-6MHzAC	CP00732	40	DS7C10F36U-N	10
Brock	70	DS7A06F36U-N	6	CP00921-6MHzAC	CP00732	90	DS7A08F36U-N	8
Buster	20	DS7A06F36D-N	8	CP00921-6MHzAC	CP00732	40	DS7A06F36D-N	6
Caliente	100	DS7A08F36U-N	8	CP00921-6MHzAC	CP00732	120	DS7C10F36U-N	10
Cave	45	DS7A06F36U3N	6.5	CP00921-6MHzAC	CP00732	65	SC479-HF1LDF(D02-E5608)	9
Coyote Springs	60	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	80	SC412-HF2LDF(E5608)	11.4
Currant Summit	35	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	55	SC412-HF2LDF(E5608)	11.4
Eagle Ridge	40	DS7A08F36U-N	8	CP00921-6MHzAC	CP00732	60	DS7C10F36U-N	10
Elko Mtn	30	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	50	SC412-HF2LDF(E5608)	11.4
Ellen Dee	40	DS7A08F36U-N	8	CP00921-6MHzAC	CP00732	60	DS7C10F36U-N	10
Emigrant	40	DS7A06F36U-N	6	CP00921-6MHzAC	CP00732	60	DS7A08F36U-N	8
Fairview Peak	5	SC473-HF1LDF	3	CP00921-6MHzAC	CP00732	20	DS7A06F36U-N	6

SITE NAME	Rx Ant Gain (dBd Hzn)
3-Mile	11.4
Alamo	11.4
Amargosa Valley	6
Austin	11.4
Bald West	6.1
Border Inn	10
Brock	8
Buster	6
Caliente	10
Cave	7.8
Coyote Springs	11.4
Currant Summit	11.4
Eagle Ridge	10
Elko Mtn	11.4
Ellen Dee	10
Emigrant	8
Fairview Peak	6

	Member	Region	Core Assignment North or South	COUNTY	SITE NAME	STATE	CHS. P25 Phase 1 *Virtual Site	SITE TYPE
18	**NDOT**	**1**	**South**	Nye	Fitzpatrick	NV	4	Multi-site
19	**NDOT**	**3**	**North**	Humboldt	Flatcreek	NV	4	Multi-site
20	**NDOT**	**3**	**North**	Humboldt	Golconda	NV	**6**	Multi-site
21	**NDOT**	**3**	**North**	Elko	HD Summit	NV	4	Multi-site
22	**NDOT**	**3**	**North**	Lander	Hickison	NV	4	Multi-site
23	**NDOT**	**1**	**South**	Lincoln	Highland Pk	NV	5	Multi-site
24	**NDOT**	**1**	**South**	Clark	Hoover Dam	NV	4	Multi-site
25	**NDOT**	**2**	**North**	Pershing	Imlay	NV	**6**	Multi-site
26	**NDOT**	**1**	**South**	Clark	**New Site - Indian Springs**	NV	4	Multi-site
27	**NDOT**	**1**	**South**	Lincoln	Irish	NV	4	Multi-site
28	**NDOT**	**3**	**North**	White Pine	Kimberly	NV	5	Multi-site
29	**NDOT**	**2**	**North**	Mineral	Kinkaid	NV	5	Multi-site
30	**NDOT**	**3**	**North**	Elko	Loray	NV	5	Multi-site
31	**NDOT**	**3**	**North**	Eureka	Mary's	NV	7	Multi-site
32	**NDOT**	**1**	**South**	Nye	Mercury	NV	5	Multi-site
33	**NDOT**	**1**	**South**	Clark	Mesquite	NV	**6**	Multi-site
34	**NDOT**	**1**	**South**	Mineral	Millers	NV	4	Multi-site
35	**NDOT**	**1**	**South**	Esmeralda	Montezuma	NV	4	Multi-site
36	**NDOT**	**3**	**North**	Lander	Moses	NV	4	Multi-site
37	**NDOT**	**2**	**North**	Douglas	Muller	NV	**6**	Multi-site
38	**NDOT**	**3**	**North**	Lander	New Pass	NV	4	Multi-site
39	**NDOT**	**1**	**South**	Esmeralda	Palmetto	NV	4	Multi-site
40	**NDOT**	**3**	**North**	Elko	Peavy Hill	NV	**6**	Multi-site
41	**NDOT**	**3**	**North**	Elko	Penn Hill	NV	4	Multi-site
42	**NDOT**	**1**	**South**	Mineral	Pilot Pk	NV	4	Multi-site

SITE NAME	TX Antennas	TX Antenna Height	Combiner Size	Additional Equipment at site	Receiver Multicoupler Size	Rx Antenna Height	# of Racks	Latitude	Longitude	Site Elevation (ft)	Combiner	Combiner Channels
Fitzpatrick	1	15 ft	4 Ch Combiner	**Existing Cross band repeaters - 3 VHF, 3-800 MHz (not included in P25 ant sys)**	8 ports	25 ft	2+2	38.488678	-117.108606	8399	DSCC75	4
Flatcreek	1	30 ft	4 Ch Combiner		8 ports	50 ft	2	41.728819	-117.719142	4725	DSCC75	4
Golconda	1	100 ft	6 Ch Combiner		8 ports	120 ft	2	40.933475	-117.4002	5348	DSCC75	6
HD Summit	1	40 ft	4 Ch Combiner		8 ports	60 ft	2	41.348025	-114.805589	6280	DSCC75	4
Hickison	1	40 ft	4 Ch Combiner	**RWIS**	8 ports	60 ft	2	39.436514	-116.725531	7080	DSCC75	4
Highland Pk	1	16 ft	5 Ch Combiner	**Existing Cross band repeaters - 3 VHF, 3-800 MHz (not included in P25 antenna system)**	8 ports	36 ft	2+2	37.894306	-114.578931	9348	DSCC75	5
Hoover Dam	1	80 ft	4 Ch Combiner		8 ports	100 ft	2	36.017378	-114.741758	1509	DSCC75	4
Imlay	1	40 ft	6 Ch Combiner		8 ports	60 ft	2	40.715911	-118.229728	5118	DSCC75	6
New Site - Indian Springs	1	40 ft	4 Ch Combiner		8 ports	60 ft	2	36.570831	-115.671389	3163	DSCC75	4
Irish	1	45 ft	4 Ch Combiner		8 ports	65 ft	2	37.644889	-115.401467	8695	DSCC75	4
Kimberly	1	40 ft	5 Ch Combiner	**RWIS**	8 ports	60 ft	2	39.314761	-115.089444	9157	DSCC75	5
Kinkaid	1	40 ft	5 Ch Combiner		8 ports	60 ft	2	38.509519	-118.436006	6470	DSCC75	5
Loray	1	80 ft	5 Ch Combiner		8 ports	100 ft	2	41.1455	-114.287817	5509	DSCC75	5
Mary's	1	20 ft	7 Ch Combiner	**Existing Cross band repeaters - 3 VHF, 3-800 MHz (not included in P25 antenna system)**	8 ports	40 ft	2+2	40.718411	-116.270847	7540	DSCC75	7
Mercury	1	30 ft	5 Ch Combiner		8 ports	50 ft	2	36.632667	-115.978769	4177	DSCC75	5
Mesquite	1	50 ft	6 Ch Combiner	Future Cross band repeaters - 3 VHF, 3-800 MHz (not included in P25 antenna system)	8 ports	80 ft	2+2	36.714381	-114.05655	2812	DSCC75	6
Millers	1	40 ft	4 Ch Combiner		8 ports	60 ft	2	38.041647	-118.1886	7874	DSCC75	4
Montezuma	1	30 ft	4 Ch Combiner		8 ports	50 ft	2	37.700692	-117.384031	7773	DSCC75	4
Moses	1	40 ft	4 Ch Combiner	Future Cross band repeaters - 3 VHF, 3-800 MHz (not included in P25 antenna system)	8 ports	60 ft	2+2	40.193536	-117.410853	8370	DSCC75	4
Muller	1	60 ft	6 Ch Combiner		8 ports	80 ft	2	38.976414	-119.794997	4689	DSCC75	6
New Pass	1	60 ft	4 Ch Combiner		8 ports	80 ft	2	39.564328	-117.481553	6598	DSCC75	4
Palmetto	1	40 ft	4 Ch Combiner		8 ports	60 ft	2	37.462081	-117.574008	8895	DSCC75	4
Peavy Hill	1	40 ft	6 Ch Combiner	**Existing Cross band repeaters - 3 VHF, 3-800 MHz (not included in P25 antenna system)** **RWIS**	16 ports	60 ft	2+2	41.19675	-114.943017	7156	DSCC75	6
Penn Hill	1	40 ft	4 Ch Combiner	**Existing Cross band repeaters - 3 VHF, 3-800 MHz (not included in P25 antenna system)** **RWIS**	8 ports	60 ft	2+2	41.735417	-116.063111	9036	DSCC75	4
Pilot Pk	1	5 ft	4 Ch Combiner	**Existing Cross band repeaters - 3 VHF, 3-800 MHz (not included in P25 antenna system)** **RWIS**	8 ports	25 ft	2+2	38.343039	-117.973389	9115	DSCC75	4

SITE NAME	Tx Ant Ht (ft)	Tx Ant Model	Tx Ant Gain (dBd)	Multicoupler	Tower Top Amp	Rx Ant Ht (ft)	Rx Ant Model	Rx Ant Gain(dBd)
Fitzpatrick	15	DS7A08F36U-N	10	CP00921-6MHzAC	CP00732	25	DS7A06F36D-N	8
Flatcreek	30	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	50	SC412-HF2LDF(E5608)	11.4
Golconda	100	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	120	SC412-HF2LDF(E5608)	11.4
HD Summit	40	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	60	SC412-HF2LDF(E5608)	11.4
Hickison	40	DS7A08F36U-N	8	CP00921-6MHzAC	CP00732	60	DS7C10F36U-N	10
Highland Pk	16	DS7C10F36U3N Vertical	9.9	CP00921-6MHzAC	CP00732	36	SC412-HF2LDF(D01-E5608)	11.4
Hoover Dam	80	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	100	SC412-HF2LDF(E5608)	11.4
Imlay	40	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	60	SC412-HF2LDF(E5608)	11.4
New Site - Indian Springs	40	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	60	SC412-HF2LDF(E5608)	11.4
Irish	45	DS7A06F36U-N	6	CP00921-6MHzAC	CP00732	65	SC473-HF1LDF	8
Kimberly	40	DS7A08F36U-N	8	CP00921-6MHzAC	CP00732	60	DS7C10F36U-N	10
Kinkaid	40	SC473-HF1LDF	3	CP00921-6MHzAC	CP00732	60	SC473-HF1LDF	3
Loray	80	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	100	SC412-HF2LDF(E5608)	11.4
Mary's	20	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	40	SC412-HF2LDF(E5608)	11.4
Mercury	30	DS7A08F36U-N	8	CP00921-6MHzAC	CP00732	50	DS7C10F36U-N	10
Mesquite	50	DS7A08F36U-N	8	CP00921-6MHzAC	CP00732	80	DS7C10F36U-N	10
Millers	40	DS7A08F36U-N	8	CP00921-6MHzAC	CP00732	60	DS7C10F36U-N	10
Montezuma	30	DS7A06F36U-N	6	CP00921-6MHzAC	CP00732	50	DS7A08F36U-N	8
Moses	40	DS7A06F36U-N	6	CP00921-6MHzAC	CP00732	60	DS7A08F36U-N	8
Muller	60	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	80	SC412-HF2LDF(E5608)	11.4
New Pass	60	DS7A06F36D-N	8	CP00921-6MHzAC	CP00732	80	DS7A06F36D-N	6
Palmetto	40	DS7A06F36U-N	6	CP00921-6MHzAC	CP00732	60	DS7A08F36U-N	8
Peavy Hill	40	SC473-HF1LDF	3	CP00921-6MHzAC	CP00732	60	SC476-HF1LDF	6.1
Penn Hill	40	DS7A08F36U-N	8	CP00921-6MHzAC	CP00732	60	DS7C10F36U-N	10
Pilot Pk	5	DS7A06F36U-N	6	CP00921-6MHzAC	CP00732	25	DS7A08F36U-N	8

SITE NAME	Rx Ant Gain (dBd Hzn)
Fitzpatrick	8
Flatcreek	11.4
Golconda	11.4
HD Summit	11.4
Hickison	10
Highland Pk	9.9
Hoover Dam	11.4
Imlay	11.4
New Site - Indian Springs	11.4
Irish	8
Kimberly	10
Kinkaid	3
Loray	11.4
Mary's	11.4
Mercury	10
Mesquite	10
Millers	10
Montezuma	8
Moses	8
Muller	11.4
New Pass	6
Palmetto	8
Peavy Hill	6.1
Penn Hill	10
Pilot Pk	8

	Member	Region	Core Assignment North or South	COUNTY	SITE NAME	STATE	CHS. P25 Phase 1 *Virtual Site	SITE TYPE
43	**NDOT**	**2**	**North**	Lyon	Pinegrove	NV	5	Multi-site
44	**NDOT**	**3**	**North**	Eureka	Prospect Pk	NV	**6**	Multi-site
45	**NDOT**	**1**	**South**	Nye	Ragged Ridge	NV	4	Multi-site
46	**NDOT**	**3**	**North**	Elko	Rocky Pt	NV	**6**	Multi-site
47	**NDOT**	**1**	**South**	Nye	Sawtooth	NV	**6**	Multi-site
48	**NDOT**	**1**	**South**	Nye	Schader	NV	4	Multi-site
49	**NDOT**	**3**	**North**	Elko	Secret Pass	NV	4	Multi-site
50	**NDOT**	**1**	**South**	Nye	Sober	NV	4	Multi-site
51	**NDOT**	**2**	**North**	Douglas	Spooner	NV	4	Multi-site
52	**NDOT**	**3**	**North**	Elko	Spruce	NV	**6**	Multi-site
53	**NDOT**	**3**	**North**	White Pine	Squaw Pk	NV	4	Multi-site
54	**NDOT**	**1**	**South**	Nye	Sunnyside	NV	5	Multi-site
55	**NDOT**	**1**	**South**	Nye	Timber	NV	4	Multi-site
56	**NDOT**	**2**	**North**	Pershing	Toulon	NV	**6**	Multi-site
57	**NDOT**	**3**	**North**	Humboldt	Trident Pk	NV	4	Multi-site
58	**NDOT**	**3**	**North**	Elko	Victoria	NV	4	Multi-site
59	**NDOT**	**1**	**South**	Nye	Warm Springs	NV	5	Multi-site
60	**NDOT**	**2**		Douglas	Wildoat	NV	5	Multi-site
61	**NDOT**	**1**	**South**	Lincoln	Wilson	NV	5	Multi-site
62	**NDOT**	**3**	**North**	Humboldt	Winnemucca	NV	5	Multi-site
63	**NDOT**	**1**	**South**	Clark	**New Site - Deer Creek**	NV	4	Multi-site
64	**NDOT**	**3**	**North**	Humboldt	**New Site - Double H**	NV	4	Multi-site
65	**NDOT**	**2**	**North**	Douglas	**New Site - Hot Springs**	NV	**6**	Multi-site

SITE NAME	TX Antennas	TX Antenna Height	Combiner Size	Additional Equipment at site	Receiver Multicoupler Size	Rx Antenna Height	# of Racks	Latitude	Longitude	Site Elevation (ft)	Combiner	Combiner Channels
Pinegrove	1	30 ft	5 Ch Combiner	**Existing Cross band repeaters - 3 VHF, 3-800 MHz (not included in P25 antenna system) RWIS**	8 ports	50 ft	2+2	38.685472	-119.185083	8206	DSCC75	5
Prospect Pk	1	40 ft	6 Ch Combiner	**Existing Cross band repeaters - 3 VHF, 3-800 MHz (not included in P25 antenna system) RWIS**	6 ports	60 ft	2+2	39.44955	-115.999044	9548	DSCC75	6
Ragged Ridge	1	40 ft	4 Ch Combiner		8 ports	60 ft	2	37.713872	-116.091256	6887	DSCC75	4
Rocky Pt	1	40 ft	6 Ch Combiner		8 ports	60 ft	2	41.121675	-114.569083	8183	DSCC75	6
Sawtooth	1	8 ft	6 Ch Combiner		8 ports	8 ft	2	36.935578	-116.850778	5784	DSCC75	6
Schader	1	45 ft	4 Ch Combiner		8 ports	65 ft	2	36.462564	-116.059864	4344	DSCC75	4
Secret Pass	1	40 ft	4 Ch Combiner		8 ports	60 ft	2	40.832775	-115.146542	7408	DSCC75	4
Sober	1	10 ft	4 Ch Combiner	**Existing Cross band repeaters - 3 VHF, 3-800 MHz (not included in P25 ant sys)**	8 ports	30 ft	2+2	37.082192	-116.818139	4922	DSCC75	4
Spooner	1	60 ft	4 Ch Combiner		8 ports	80 ft	2	39.095808	-119.910672	6998	DSCC75	4
Spruce	1	35 ft	6 Ch Combiner	**Existing Cross band repeaters - 3 VHF, 3-800 MHz (not included in P25 antenna system) RWIS**	8 ports	55 ft	2+2	40.553075	-114.821467	10210	DSCC75	6
Squaw Pk	1	45 ft	4 Ch Combiner	**Existing Cross band repeaters - 3 VHF, 3-800 MHz (not included in P25 antenna system) RWIS**	8 ports	65 ft	2+2	39.281667	-114.894272	7215	DSCC75	4
Sunnyside	1	30 ft	5 Ch Combiner		8 ports	50 ft	2	38.451842	-115.012794	5328	DSCC75	5
Timber	1	20 ft	4 Ch Combiner		8 ports	40 ft	2	38.371794	-115.494839	9161	DSCC75	4
Toulon	1	5 ft	6 Ch Combiner	**Existing Cross band repeaters - 3 VHF, 3-800 MHz (not included in P25 antenna system) RWIS**	8 ports	20 ft	2+2	40.118022	-118.728522	6795	DSCC75	6
Trident Pk	1	25 ft	4 Ch Combiner	Future Cross band repeaters - 3 VHF, 3-800 MHz (not included in P25 ant sys)	8 ports	45 ft	2+2	41.88655	-118.409953	8455	DSCC75	4
Victoria	1	20 ft	4 Ch Combiner		8 ports	40 ft	2	40.322917	-114.562308	8554	DSCC75	4
Warm Springs	1	16 ft	5 Ch Combiner	**Existing Cross band repeaters - 3 VHF, 3-800 MHz (not included in P25 antenna system)**	8 ports	36 ft	2+2	38.191981	-116.418106	7556	DSCC75	5
Wildoat	1	50 ft	5 Ch Combiner		8 ports	70 ft	2	38.710081	-119.542344	5975	DSCC75	5
Wilson	1	40 ft	5 Ch Combiner		8 ports	60 ft	2	38.238033	-114.381653	9285	DSCC75	5
Winnemucca	1	30 ft	5 Ch Combiner	**Existing Cross band repeaters - 3 VHF, 3-800 MHz (not included in P25 antenna system) RWIS**	8 ports	50 ft	2+2	41.008128	-117.770058	6664	DSCC75	5
New Site - Deer Creek	1	60 ft	4 Ch Combiner		8 ports	80 ft	2	36.316667	-115.619639	8225	DSCC75	4
New Site - Double H	1	60 ft	4 Ch Combiner		8 ports	80 ft	2	41.4745	-118.0575	5030	DSCC75	4
New Site - Hot Springs	1	180 ft	6 Ch Combiner		8 ports	200 ft	2	39.065833	-119.721389	5916	DSCC75	6

SITE NAME	Tx Ant Ht (ft)	Tx Ant Model	Tx Ant Gain (dBd)	Multicoupler	Tower Top Amp	Rx Ant Ht (ft)	Rx Ant Model	Rx Ant Gain(dBd)
Pinegrove	30	DS7A08F36U-N	8	CP00921-6MHzAC	CP00732	50	DS7C10F36U-N	10
Prospect Pk	40	DS7A06F36U-N	6	CP00921-6MHzAC	CP00732	60	DS7A08F36U-N	8
Ragged Ridge	40	DS7A06F36U-N	6	CP00921-6MHzAC	CP00732	60	DS7A08F36U-N	8
Rocky Pt	40	DS7A08F36U-N	8	CP00921-6MHzAC	CP00732	60	DS7C10F36U-N	10
Sawtooth	8	SC432D-HF6LDF(D00-I40-G06)	6	CP00921-6MHzAC	CP00732	8	SC432D-HF6LDF(D00-I40-G06)	6
Schader	45	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	65	SC488-HF6LDF(D00)	11.4
Secret Pass	40	DS7A06F36U-N	6	CP00921-6MHzAC	CP00732	60	DS7A08F36U-N	8
Sober	10	DS7A06F36U-N	6	CP00921-6MHzAC	CP00732	30	DS7A08F36U-N	8
Spooner	60	SC473-HF1LDF	3	CP00921-6MHzAC	CP00732	80	DS7A06F36U-N	6
Spruce	35	DS7A06F36U3N	6.5	CP00921-6MHzAC	CP00732	55	DS7A06F36U3N	6.5
Squaw Pk	45	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	65	SC412-HF2LDF(E5608)	11.4
Sunnyside	30	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	50	SC412-HF2LDF(E5608)	11.4
Timber	20	DS7A06F36U3N	6.5	CP00921-6MHzAC	CP00732	40	DS7A06F36U3N	6
Toulon	5	DS7A08F36U-N	8	CP00921-6MHzAC	CP00732	20	DS7C10F36U-N	10
Trident Pk	25	DS7A06F36U-N	6	CP00921-6MHzAC	CP00732	45	DS7A08F36U-N	8
Victoria	20	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	40	SC412-HF2LDF(E5608)	11.4
Warm Springs	16	DS7A06F36U-N	6	CP00921-6MHzAC	CP00732	36	DS7A08F36U-N	8
Wildoat	50	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	70	SC412-HF2LDF(E5608)	11.4
Wilson	40	DS7A08F36U-N	8	CP00921-6MHzAC	CP00732	60	DS7C10F36U-N	10
Winnemucca	30	DS7A08F36U-N	8	CP00921-6MHzAC	CP00732	50	DS7C10F36U-N	10
New Site - Deer Creek	60	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	80	SC412-HF2LDF(E5608)	11.4
New Site - Double H	60	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	80	SC412-HF2LDF(E5608)	11.4
New Site - Hot Springs	180	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	200	SC412-HF2LDF(E5608)	11.4

SITE NAME	Rx Ant Gain (dBd Hzn)
Pinegrove	10
Prospect Pk	8
Ragged Ridge	8
Rocky Pt	10
Sawtooth	6
Schader	11.4
Secret Pass	8
Sober	8
Spooner	6
Spruce	6.3
Squaw Pk	11.4
Sunnyside	11.4
Timber	4.2
Toulon	10
Trident Pk	8
Victoria	11.4
Warm Springs	8
Wildoat	11.4
Wilson	10
Winnemucca	10
New Site - Deer Creek	11.4
New Site - Double H	11.4
New Site - Hot Springs	11.4

	Member	Region	Core Assignment North or South	COUNTY	SITE NAME	STATE	CHS. P25 Phase 1 *Virtual Site	SITE TYPE
66	NDOT	3	North	Elko	New Site - Jackpot (NDOT constructing)	NV	4	Multi-site
67	NDOT	1	South	Clark	New Site - Mtn Springs	NV	4	Multi-site
68	NDOT	2	North	Washoe	New Site - Painted Rock (NDOT constructing)	NV	6	Multi-site
69	NDOT	2	North	CA	New Site - Tahoe Mtn	NV	4	Multi-site
70	NDOT	1	South	Lincoln	New Site - Tempiute	NV	4	Multi-site
71	NDOT	2	North	Storey	New Site - USA Pkwy (NDOT constructing)	NV	5	Multi-site
72	NDOT	1	South	Lincoln	New Site -S. of White River	NV	4	Multi-site
						TOTAL CHS	344	P25 Stations
							78	NCRN (800 MHz)
							422	Phase 1

SITE NAME	TX Antennas	TX Antenna Height	Combiner Size	Additional Equipment at site	Receiver Multicoupler Size	Rx Antenna Height	# of Racks	Latitude	Longitude	Site Elevation (ft)	Combiner	Combiner Channels
New Site - Jackpot (NDOT constructing)	1	40 ft	4 Ch Combiner		8 ports	60 ft	2	41.989608	-114.658306	5263	DSCC75	4
New Site - Mtn Springs	1	80 ft	4 Ch Combiner		8 ports	100 ft	2	36.018394	-115.506022	5476	DSCC75	4
New Site - Painted Rock (NDOT constructing)	1	60 ft	6 Ch Combiner		8 ports	80 ft	2	39.891667	-119.368333	4173	DSCC75	6
New Site - Tahoe Mtn	1	60 ft	4 Ch Combiner		8 ports	80 ft	2	38.910278	-120.036111	7225	DSCC75	4
New Site - Tempiute	1	180 ft	4 Ch Combiner		8 ports	200 ft	2	37.625347	-115.634358	7809	DSCC75	4
New Site - USA Pkwy (NDOT constructing)	1	60 ft	5 Ch Combiner		8 ports	80 ft	2	39.480889	-119.394167	5958	DSCC75	5
New Site -S. of White River	1	180 ft	4 Ch Combiner		8 ports	200 ft	2	37.879442	-115.024019	5630	DSCC75	4

SITE NAME	Tx Ant Ht (ft)	Tx Ant Model	Tx Ant Gain (dBd)	Multicoupler	Tower Top Amp	Rx Ant Ht (ft)	Rx Ant Model	Rx Ant Gain(dBd)
New Site - Jackpot (NDOT constructing)	40	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	60	SC412-HF2LDF(E5608)	11.4
New Site - Mtn Springs	80	DS7A06F36U6N	6	CP00921-6MHzAC	CP00732	100	DS7A06F36U6N	6
New Site - Painted Rock (NDOT constructing)	60	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	80	SC412-HF2LDF(E5608)	11.4
New Site - Tahoe Mtn	60	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	80	SC412-HF2LDF(E5608)	11.4
New Site - Tempiute	180	DS7C10F36U3N Vertical	9.9	CP00921-6MHzAC	CP00732	200	SC412-HF2LDF(D01-E5608)	11.4
New Site - USA Pkwy (NDOT constructing)	60	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	80	SC412-HF2LDF(E5608)	11.4
New Site -S. of White River	180	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	200	SC412-HF2LDF(E5608)	11.4

SITE NAME	Rx Ant Gain (dBd Hzn)
New Site - Jackpot (NDOT constructing)	11.4
New Site - Mtn Springs	4.2
New Site - Painted Rock (NDOT constructing)	11.4
New Site - Tahoe Mtn	11.4
New Site - Tempiute	9.9
New Site - USA Pkwy (NDOT constructing)	11.4
New Site -S. of White River	11.4

	Member	Region	Core Assignment North or South	COUNTY	SITE NAME	STATE	CHS. P25 Phase 1 *Virtual Site	SITE TYPE
NV ENERGY							**344**	**FREQUENCIES**
VIDA Premier/Connect HA #2B -Edison, Washoe Co								
1	**NVE**	**2**	**North**	Nevada	Alder Hill	CA	4	Multi-site
2	**NVE**	**1**	**South**	Clark	Angels	NV	8	Multi-site
3	**NVE**	**3**	**North**	Lander	Argenta	NV	6	Multi-site
4	**NVE**	**2**	**North**	Plumas	Beckworth	CA	4	Multi-site
5	**NVE**	**1**	**South**	Washinton	Beaver Dam	Utah	4	Multi-site
6	**NVE**	**1**	**South**	Clark	Bighorn	NV	7	Multi-site
7	**NVE**	**1**	**South**	Kane	Buckskin	Utah	3	Multi-site
8	**NVE**	**3**	**North**	Eureka	Chevas	NV	5	Multi-site
9	**NVE**	**2**	**North**	Washoe	Chimney	NV	16	**Simulcast Cell#3 (Washoe Cluster)**
10	**NVE**	**1**	**South**	Clark	Christmas Tree	NV	6	Multi-site
11	**NVE**	**3**	**North**	White Pine	Conners Pass	NV	5	Multi-site
12	**NVE**	**3**	**North**	Elko	East Twin	NV	8	Multi-site
13	**NVE**	**2**	**North**	Pershing	Fencemaker	NV	4	Multi-site
14	**NVE**	**1**	**South**	Clark	Glendale	NV	9	Simulcast Cell#7
15	**NVE**	**1**	**South**	Clark	Reid Gardner	NV	9	Simulcast Cell#7
16	**NVE**	**1**	**South**	Clark	Lenzie	NV	5	**Simulcast Cell#6**
17	**NVE**	**1**	**South**	Clark	**New Site - Apex (NVE Microwave Site) (existing twr)**		5	**Simulcast Cell#6**
18	**NVE**	**1**	**South**	Clark	LV SC Beltway	NV	16	**Simulcast Cell#2**
19	**NVE**	**1**	**South**	Clark	New Site - LV SC Cabana	NV	16	**Simulcast Cell#2**
20	**NVE**	**1**	**South**	Clark	LV SC Cheyenne	NV	16	**Simulcast Cell#2**
21	**NVE**	**1**	**South**	Clark	New Site - LV SC Decatur	NV	16	**Simulcast Cell#2**
22	**NVE**	**1**	**South**	Clark	LV SC Durango	NV	16	**Simulcast Cell#2**
23	**NVE**	**1**	**South**	Clark	New Site - LV SC Ryan	NV	16	**Simulcast Cell#2**
24	**NVE**	**1**	**South**	Clark	LV SC Washington	NV	16	**Simulcast Cell#2**
25	**NVE**	**1**	**South**	Clark	LV SC Westside	NV	16	**Simulcast Cell#2**
26	**NVE**	**1**	**South**	Clark	Potosi	NV	8	Multi-site
27	**NVE**	**1**	**South**	Clark	Opal	NV	7	Multi-site
28	**NVE**	**1**	**South**	Coconiono	Page	AZ	3	Multi-site
29	**NVE**	**2**	**North**	Storey	Patrick	NV	8	Multi-site
30	**NVE**	**2**	**North**	Lyon	Pinenut	NV	8	Multi-site
31	**NVE**	**1**	**South**	Mohave	Pipe Springs	AZ	3	Multi-site
32	**NVE**	**2**	**North**	Lassen	Shaffer	CA	4	Multi-site
33	**NVE**	**1**	**South**	Clark	Sloan	NV	10	Multi-site
34	**NVE**	**2**	**North**	Mineral	TV Hill	NV	6	Multi-site
35	**NVE**	**1**	**South**	Clark	**New Site - Mt Charleston**	NV	4	Multi-site

SITE NAME	TX Antennas	TX Antenna Height	Combiner Size	Additional Equipment at site	Receiver Multicoupler Size	Rx Antenna Height	# of Racks	Latitude	Longitude	Site Elevation (ft)	Combiner	Combiner Channels
Alder Hill	1	10 ft	4 Ch Combiner		8 ports	30 ft	2	39.352317	-120.195256	6697	DSCC85	4
Angels	1	25 ft	8 Ch Combiner		8 ports	45 ft	2	36.318986	-115.574856	8829	DSCC75	8
Argenta	1	80 ft	6 Ch Combiner	Future Cross band repeaters - 3 VHF, 3-800 MHz (not included in P25 antenna system)	8 ports	100 ft	2+2	40.621228	-116.688742	7376	DSCC75	6
Beckworth	1	55 ft	4 Ch Combiner		8 ports	75 ft	2	39.768839	-120.436744	7225	DSCC75	4
Beaver Dam	1	65 ft	4 Ch Combiner		8 ports	90 ft	2	37.155961	-113.883322	7615	DSCC75	4
Bighorn	1	30 ft	7 Ch Combiner		8 ports	50 ft	2	35.614806	-115.355639	2792	DSCC75	7
Buckskin	1	70 ft	4 Ch Combiner		8 ports	90 ft	2	37.124517	-112.003228	5968	DSCC75	4
Chevas	1	40 ft	5 Ch Combiner		8 ports	60 ft	2	40.941731	-116.310406	7199	DSCC75	5
Chimney	2	80 ft	2, 10 Ch Combiners		16 ports	100 ft	4	39.460014	-119.958333	8134	DSCC75	10
Christmas Tree	1	70 ft	6 Ch Combiner		8 ports	90 ft	2	35.249472	-114.743306	4777	DSCC75	6
Conners Pass	1	100 ft	5 Ch Combiner		8 ports	120 ft	2	39.024281	-114.644189	8084	DSCC75	5
East Twin	1	90 ft	8 Ch Combiner		8 ports	110 ft	2	40.928589	-115.844044	7422	DSCC75	8
Fencemaker	1	40 ft	4 Ch Combiner		8 ports	60 ft	2	40.079067	-117.831897	6824	DSCC75	4
Glendale	1	70 ft	9 Ch Combiner		16 ports	90 ft	3	36.684764	-114.5185	2179	DSCC75	9
Reid Gardner	1	210 ft	9 Ch Combiner		16 ports	230 ft	3	36.658267	-114.636003	1598	DSCC75	9
Lenzie	**1**	130 ft	5 Ch Combiner		8 ports	150 ft	2	36.385667	-114.920444	2228	DSCC75	5
New Site - Apex (NVE Microwave Site) (existing twr)	1	50 ft	5 Ch Combiner		8 ports	70 ft	2	36.333708	-114.976092	3386	DSCC75	5
LV SC Beltway	2	70 ft	2, 8 Ch Combiners		16 ports	90 ft	3	36.058831	-115.218361	2395	DSCC75	8
New Site - LV SC Cabana	2	80 ft	2, 8 Ch Combiners		16 ports	100 ft	3	36.114703	-115.057181	1693	DSCC75	8
LV SC Cheyenne	2	60 ft	2, 8 Ch Combiners		16 ports	80 ft	3	36.219447	-115.277167	2441	DSCC75	8
New Site - LV SC Decatur	2	80 ft	2, 8 Ch Combiners		16 ports	100 ft	3	36.114239	-115.212453	2277	DSCC75	8
LV SC Durango	2	80 ft	2, 8 Ch Combiners		16 ports	100 ft	3	36.115694	-115.276639	2539	DSCC75	8
New Site - LV SC Ryan	2	100 ft	2, 8 Ch Combiners		16 ports	120 ft	3	36.245528	-115.117753	1942	DSCC75	8
LV SC Washington	2	40 ft	2, 8 Ch Combiners		16 ports	60 ft	3	36.182967	-115.137086	1969	DSCC75	8
LV SC Westside	2	70 ft	2, 8 Ch Combiners		16 ports	90 ft	3	36.15775	-115.277639	2648	DSCC75	8
Potosi	1	50 ft	8 Ch Combiner		8 ports	70 ft	2	35.965253	-115.500553	8393	DSCC75	8
Opal	1	20 ft	7 Ch Combiner		8 ports	40 ft	2	35.701164	-114.892028	4787	DSCC75	7
Page	1	30 ft	4 Ch Combiner		8 ports	50 ft	2	36.902056	-111.3934	4370	DSCC75	4
Patrick	1	230 ft	8 Ch Combiner		8 ports	250 ft	2	39.552417	-119.534417	4593	DSCC75	8
Pinenut	1	5 ft	8 Ch Combiner	Existing Cross band repeaters - 3 VHF, 3-800 MHz (not included in P25 antenna system)	8 ports	22 ft	2+2	39.197514	-119.489625	8088	DSCC75	8
Pipe Springs	1	60 ft	4 Ch Combiner		8 ports	80 ft	2	36.881106	-112.809239	6582	DSCC75	4
Shaffer	1	80 ft	4 Ch Combiner		8 ports	100 ft	2	40.446756	-120.358078	6690	DSCC75	4
Sloan	1	50 ft	10 Ch Combiner		16 ports	70 ft	3	35.951264	-115.191844	3268	DSCC75	10
TV Hill	1	65 ft	6 Ch Combiner	**Existing Cross band repeaters - 3 VHF, 3-800 MHz (not included in P25 antenna system)**	8 ports	85 ft	2+2	38.45765	-118.765406	10253	DSCC75	6
New Site - Mt Charleston	1	40 ft	4 Ch Combiner	Site location to be determined. Mt Charleston site is excluded from coverage analysis.	8 ports	40 ft	2	36.257533	-115.643297	7530	DSCC75	4

SITE NAME	Tx Ant Ht (ft)	Tx Ant Model	Tx Ant Gain (dBd)	Multicoupler	Tower Top Amp	Rx Ant Ht (ft)	Rx Ant Model	Rx Ant Gain(dBd)
Alder Hill	10	SC432D-HF6LDF(D00-I45-G00)	0	CP00921-6MHzAC	CP00732	30	SC432D-HF6LDF(D00-I45-G00)	0
Angels	25	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	45	SC412-HF2LDF(E5608)	11.4
Argenta	80	DS7A08F36U-N	8	CP00921-6MHzAC	CP00732	100	DS7C10F36U-N	10
Beckworth	55	DS7A08F36U-N	8	CP00921-6MHzAC	CP00732	75	DS7C10F36U-N	10
Beaver Dam	65	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	90	SC412-HF2LDF(E5608)	11.4
Bighorn	30	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	50	SC412-HF2LDF(E5608)	11.4
Buckskin	70	DS7A08F36U-N	8	CP00921-6MHzAC	CP00732	90	SC412-HF2LDF(E5608)	11.4
Chevas	40	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	60	SC412-HF2LDF(E5608)	11.4
Chimney	35	DS7C10F36U3N Vertical	9.9	CP00921-6MHzAC	CP00732	50	SC412-HF2LDF(D04-E5608)	11.5
Christmas Tree	70	DS7A08F36U-N	8	CP00921-6MHzAC	CP00732	90	DS7C10F36U-N	10
Conners Pass	100	DS7A08F36U-N	8	CP00921-6MHzAC	CP00732	120	DS7C10F36U-N	10
East Twin	90	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	110	SC412-HF2LDF(E5608)	11.4
Fencemaker	40	DS7A08F36U-N	8	CP00921-6MHzAC	CP00732	60	DS7C10F36U-N	10
Glendale	70	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	90	SC412-HF2LDF(E5608)	11.4
Reid Gardner	210	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	230	SC412-HF2LDF(E5608)	11.4
Lenzie	130	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	150	SC412-HF2LDF(E5608)	11.4
New Site - Apex (NVE Microwave Site) (existing twr)	50	DS7A08F36U-N	8	CP00921-6MHzAC	CP00732	70	DS7C10F36U-N	10
LV SC Beltway	70	DS7A08F36U-N	8	CP00921-6MHzAC	CP00732	90	DS7C10F36U-N	10
New Site - LV SC Cabana	80	SE414-SWBPALDF(D00)_R90	10	CP00921-6MHzAC	CP00732	100	SE414-SWBPALDF(D00)_R90	11.4
LV SC Cheyenne	60	SE419-SWBP4LDF(D00)	10	CP00921-6MHzAC	CP00732	80	SE419-SWBP4LDF(D00)	8
New Site - LV SC Decatur	80	DS7A08F36U-N	8	CP00921-6MHzAC	CP00732	100	DS7C10F36U-N	10
LV SC Durango	80	DS7A08F36U-N	8	CP00921-6MHzAC	CP00732	100	DS7C10F36U-N	10
New Site - LV SC Ryan	100	SE419-SWBPALDF(D00)_R105	13.1	CP00921-6MHzAC	CP00732	120	SE419-SWBPALDF(D00)_R105	11.4
LV SC Washington	40	DS7A08F36U-N	8	CP00921-6MHzAC	CP00732	60	DS7C10F36U-N	10
LV SC Westside	70	DS7A08F36U-N	8	CP00921-6MHzAC	CP00732	90	DS7C10F36U-N	10
Potosi	50	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	70	SC412-HF2LDF(E5608)	11.4
Opal	20	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	40	SC412-HF2LDF(E5608)	11.4
Page	30	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	50	SC412-HF2LDF(E5608)	11.4
Patrick	230	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	250	SC412-HF2LDF(E5608)	11.4
Pinenut	5	DS7A08F36U-N	8	CP00921-6MHzAC	CP00732	22	DS7C10F36U-N	10
Pipe Springs	60	DS7A08F36U-N	8	CP00921-6MHzAC	CP00732	80	DS7C10F36U-N	10
Shaffer	80	DS7A08F36U-N	8	CP00921-6MHzAC	CP00732	100	DS7C10F36U-N	10
Sloan	50	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	70	SC412-HF2LDF(E5608)	11.4
TV Hill	65	DS7A06F36U-N	6	CP00921-6MHzAC	CP00732	85	DS7A08F36U-N	8
New Site - Mt Charleston	40	DS7A06F36U3N	6.5	CP00921-6MHzAC	(None)	40	SC479-HF1LDF(D00-E6085)	9.9

SITE NAME	Rx Ant Gain (dBd Hzn)
Alder Hill	-0.2
Angels	11.4
Argenta	10
Beckworth	10
Beaver Dam	11.4
Bighorn	11.4
Buckskin	11.4
Chevas	11.4
Chimney	5.3
Christmas Tree	10
Conners Pass	10
East Twin	11.4
Fencemaker	10
Glendale	11.4
Reid Gardner	11.4
Lenzie	11.4
New Site - Apex (NVE Microwave Site) (existing twr)	10
LV SC Beltway	10
New Site - LV SC Cabana	11.4
LV SC Cheyenne	8
New Site - LV SC Decatur	10
LV SC Durango	10
New Site - LV SC Ryan	11.4
LV SC Washington	10
LV SC Westside	10
Potosi	11.4
Opal	11.4
Page	11.4
Patrick	11.4
Pinenut	10
Pipe Springs	10
Shaffer	10
Sloan	11.4
TV Hill	8
New Site - Mt Charleston	5.1

	Member	Region	Core Assignment North or South	COUNTY	SITE NAME	STATE	CHS. P25 Phase 1 *Virtual Site	SITE TYPE
36	NVE	2	North	Washoe	New Site - Ophir	NV	10	Multi-site
37	NVE	1	South	Lincoln	New Site - Pahranagat	NV	4	Multi-site
38	NVE	1	South	Clark	New Site - Blue Diamond	NV	4	Multi-site
39	NVE	1	South	Clark	New Site - Laughlin	AZ	6	Multi-site
40	NVE	1	South	Clark	New Site - Red Mtn	NV	4	Multi-site
						TOTAL CHS	325	P25 Stations
							9	NCRN (800 MHz)
							334	Phase 1

SITE NAME	TX Antennas	TX Antenna Height	Combiner Size	Additional Equipment at site	Receiver Multicoupler Size	Rx Antenna Height	# of Racks	Latitude	Longitude	Site Elevation (ft)	Combiner	Combiner Channels
New Site - Ophir	1	100 ft	10 Ch Combiner		16 ports	125 ft	3	39.318558	-119.6698	7746	DSCC75	10
New Site - Pahranagat	1	150 ft	4 Ch Combiner		8 ports	170 ft	2	37.252769	-115.003711	5781	DSCC75	4
New Site - Blue Diamond	1	69 ft	4 Ch Combiner		8 ports	80 ft	2	36.106628	-115.402983	4823	DSCC75	4
New Site - Laughlin	1	100 ft	6 Ch Combiner		8 ports	120 ft	2	35.146642	-114.599803	725	DSCC75	6
New Site - Red Mtn	1	25 ft	4 Ch Combiner		8 ports	45 ft	2	35.995353	-114.864631	3534	DSCC75	4

183 **FREQUENCIES**

SITE NAME	Tx Ant Ht (ft)	Tx Ant Model	Tx Ant Gain (dBd)	Multicoupler	Tower Top Amp	Rx Ant Ht (ft)	Rx Ant Model	Rx Ant Gain(dBd)
New Site - Ophir	100	DS7C10F36U3N Vertical	9.9	CP00921-6MHzAC	CP00732	125	DS7C10F36U3N Vertical	9.9
New Site - Pahranagat	150	SE414-SWBP2LDF(D00)	7.5	CP00921-6MHzAC	(None)	170	SE414-SWBPALDF(D00)_R90	10
New Site - Blue Diamond	60	DS7A08F36U-N	8	CP00921-6MHzAC	CP00732	80	DS7C10F36U-N	10
New Site - Laughlin	100	DS7A08F36U-N	8	CP00921-6MHzAC	CP00732	120	DS7C10F36U-N	10
New Site - Red Mtn	25	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	45	SC412-HF2LDF(E5608)	11.4

SITE NAME	Rx Ant Gain (dBd Hzn)
New Site - Ophir	5.1
New Site - Pahranagat	10
New Site - Blue Diamond	10
New Site - Laughlin	10
New Site - Red Mtn	11.4

NSRS System Drawings

HARRIS — Communication Systems Division, Public Safety & Professional Communications	CRM# 16CS02712
PRELIMINARY ENGINEERING SKETCH COMPANY CONFIDENTIAL	TABLE OF CONTENTS
PREPARED BY: A. OGDEN	
DATE: 7/25/2018	Nevada Shared Radio System
SKETCH #: 16CS02712	SHEET # 1 OF 21

VIDA Premier Core
127 RF Sites

Las Vegas SANS (NDOT)

Primary VIDA Core - South

Primary VIDA Premier Core Includes;
VIDA Application Server (VAS)
-Network Switching (NSS1) VM
-Unified Admin. System VM
-Enterprise Network Manager VM
-Regional Network Mgr VM
-Regional Site Mgr VM
-Active Directory VM
-McAfee Epolicy Orchestrator VM
-BeOn VM
- KMF VM
-SUMS Server
-Transcoder VM
-ISSI VM
-StatusAware VM

Firewall

Router

Unitrends Backup

Connection to Local P25 Radio System

Encompass Gateway (VM) – 102 Talkpaths

NCRN Sites

Connection To 3rd Party Consoles

ISSI/CSSI Gateway (VM) – 4 connections
-20 talkpaths per connection
-1 connection dedicated to 75 third party console interfaces

New EDACS Migration Gateway – 24 Talkpaths

EDACS Legacy System

VIDA Management Terminal (1)

BeOn Connection

Internet

Existing Asset Management System

Internet Firewall

Washoe NOC (WC)

Secondary VIDA Core - North

Firewall

Router

Secondary VIDA Core Includes;
VIDA Application Server (VAS)
-Network Switching (NSS2) VM
-Enterprise Network Manager VM
-Regional Network Mgr VM
-Regional Site Mgr VM
-Active Directory VM
-BeOn
-Transcoder VM
-ISSI VM

Unitrends Backup

BeOn Connection

Internet

Internet Firewall

Multiple Network Management Locations – (NDOT)

Network Management Terminals (10)

Customer Provided Router & Network Connection

Multiple Network Management Locations – (NVE)

Network Management Terminals (6)

Customer Provided Router & Network Connection

Multiple Network Management Locations – (WC)

Customer Provided Router & Network Connection

Network Management Terminals (10)

Multiple Control Station Locations (WC)

(2) New Control Stations
(2) Existing Control Stations

Multiple Control Station Locations (NDOT)

(48) New Control Stations + Tone Remote
(53) Existing Control Stations + Tone Remote

Multiple Control Station Locations (NVE)

(35) New Control Stations

NSRS Provided Backhaul

Connect Core - South

Connect Core - North

LEGEND

- Control Site
- RF 'Multicast' Site
- RF Simulcast Site
- Dispatch/Control Stations
- NCRN Sites
- RWIS Sites
- Site-on-Wheels

HARRIS Communication Systems Division, Public Safety & Professional Communications

CRM# 16CS02712

PRELIMINARY ENGINEERING SKETCH
COMPANY CONFIDENTIAL

HIGH-LEVEL SYSTEM BLOCK DIAGRAM - PREMIER

PREPARED BY: A. OGDEN

DATE: 7/25/2018

Nevada Shared Radio System

SKETCH #: 16CS02712

VIDA Connect Core – North (70 RF Sites)

Washoe NOC (WC)

Primary VIDA Connect Core - North

Primary VIDA Connect Core Includes;
VIDA Application Server (VAS)
-Network Switching (NSS1) VM
-Enterprise Network Manager VM
-Regional Network Mgr VM
-Regional Site Mgr VM
-Active Directory VM
-BeOn VM[1]
- KMF VM[1]
-SUMS Server[1]
-Transcoder VM
-ISSI VM[1]
-StatusAware VM[1]

Router

Redundant Logging Recorders (WC)
(2 X 144 Talkpaths)

Upgrade to Existing Asset Management System

VIDA Management Terminal (1)

EDACS Legacy System

Existing EDACS Migration Gateway

Redundant Logging Recorders (WCSD)
(2 X 48 Talkpaths)

Existing/New NCRN Sites - North

To co-located SAR

800/VHF Cross-Band Repeater

Austin (NDOT)	
Bald Mtn (NDOT)	Poito (NDOT)
Cave Mtn (NDOT)	Prospect Pk (NDOT)
Eagle Ridge (NDOT)	Spruce Mtn (NDOT)
Elko Mtn (NDOT)	Squaw Peak (NDOT)
Ellen Dee (NDOT)	Toulon Pk (NDOT)
Mary's Mtn (NDOT)	Winnemucca (NDOT)
Peavine (NDOT)	3-Mile[3] (NDOT)
Peavy Hill (NDOT)	Argenta[3] (NDOT)
Penn Hill (NDOT)	Fairview[3] (NDOT)
Pine Grove (NDOT)	Moses[3] (NDOT)
Pinenut (NDOT)	Trident[3] (NDOT)

(23 Sites)

Existing RWIS Sites - North

200 kb/15 min

Austin Mtn (NDOT)	Penn Hill (NDOT)
Border Inn (NDOT)	Pinegrove (NDOT)
Cave Mtn (NDOT)	Prospect Pk (NDOT)
Ellen Dee (NDOT)	Spruce (NDOT)
Hickison (NDOT)	Squaw Pk (NDOT)
Kimberly (WC)	Toulon (NDOT)
Peavy Hill (NDOT)	Winnemucca (NDOT)

(14 Sites)

Edison (NVE)

Secondary VIDA Connect Core - North

Router

Secondary VIDA Connect Core Includes;
VIDA Application Server (VAS)
-Network Switching (NSS2) VM
-Enterprise Network Manager VM
-Regional Network Mgr VM
-Regional Site Mgr VM
-Active Directory VM
-BeOn VM[1]
-Transcoder VM
-ISSI VM[1]

VIDA Management Terminal (1)

Reno/Carson City - North (DPS)

(114) New Control Stations

Multiple Dispatch Locations - North (NDOT)

Redundant Routers

New Symphony Consoles (5)
Existing Symphony Consoles[4] (9)

Multiple Dispatch Locations - North (WC)

Redundant Routers

New Symphony Consoles (12)
Existing Symphony Consoles[4] (27)

NSRS Provided Backhaul

700 MASTR V 4 Channels — Site-on-Wheels (WC)

800 MASTR V 4 Channels — Site-on-Wheels (NVE)

800 MASTR V 4 Channels — Site-on-Wheels (NVE)

Edison Dispatch - North (NVE)

Redundant Routers

Existing Symphony Consoles[4] (6)

GOB Dispatch (NVE)

Customer Provided Router & Network Connection

Redundant Logging Recorders (NVE)
(2 X 176 Talkpaths)

P25 Simulcast Systems

Biltmore (WC) & Snowflake (WC)

Redundant Routers
(2) DCPs
MASTR V 8 Channels

Marble (WC) & Virginia Peak (WC)

Redundant Routers
(2) DCPs
MASTR V 10 Channels

Mt Rose (WC) & Slide Mtn (WC)

Redundant Routers
(2) DCPs
MASTR V 12 Channels

Peavine (WC)[5], Red Pk (WC)[5] & Chimney Pk (NVE)

Redundant Routers
MASTR V 16 Channels

Redundant Routers
MASTR V 3 Channels
**49 Mtn (WC)
Yellow Pk (WC)
(2 Sites)**

Redundant Routers
MASTR V 4 Channels
**Red Rock (WC)
Alder Hill, CA (NVE)
Beckworth, CA (NVE)
Fencemaker (NVE)
Shaffer, CA (NVE)
Austin (NDOT)
Border Inn (NDOT)
Buster[2] (NDOT)
Emigrant (NDOT)
Flatcreek (NDOT)
HD Summit (NDOT)
Hickison (NDOT)
Moses (NDOT)
New Pass (NDOT)
Penn Hill (NDOT)
Secret Pass (NDOT)
Spooner (NDOT)
Squaw Peak (NDOT)
Trident (NDOT)
Victoria (NDOT)
Jackpot (NDOT)
Double H (NDOT)
Tahoe Mtn (NDOT)
(23 Sites)**

Redundant Routers
MASTR V 5 Channels
**Fox (WC)
Chevas (NVE)
Conners Pass (NVE)
3-Mile (NDOT)
Bald West (NDOT)
Cave (NDOT)
Ellen Dee (NDOT)
Fairview Pk (NDOT)
Kimberly (NDOT)
Loray (NDOT)
Pinegrove (NDOT)
Wildoat (NDOT)
Winnemucca (NDOT)
USA Hwy (NDOT)
(14 Sites)**

Redundant Routers
MASTR V 6 Channels
**Poito (WC)
Argenta (NVE)
Muller (NDOT)
Golconda (NDOT)
Imlay (NDOT)
Peavy Hill (NDOT)
Prospect Pk (NDOT)
Rocky Point (NDOT)
Spruce (NDOT)
TV Hill (NVE)
Toulon (NDOT)
Painted Rock (NDOT)
Hot Springs (NDOT)
(13 Sites)**

Redundant Routers
MASTR V 7 Channels
**Eagle Ridge (NDOT)
Mary's Mtn (NDOT)
(2 Sites)**

Redundant Routers
MASTR V 8 Channels
**Truckee Station 18 (WC)
East Twin (NVE)
Patrick (NVE)
Pinenut (NVE)
Elko Mtn (NDOT)
(5 Sites)**

Redundant Routers
MASTR V 10 Channels
**Ophir (NVE)
(1 Site)**

Redundant Routers
MASTR V 12 Channels
**Smokey Quartz (WC)
(1 Site)**

Customer Provided 4-Wire Interfaces

To co-located SAR

(1) Interoperability Gateways - 8 Talkpaths Each

**Washoe County
(15 Sites)**

[1]These features are housed on the VIDA Premier Core
[2]Solar sites (MASTR V @ 20W)
[3]New NCRN Sites
[4]Windows 10 software upgrade needed
[5]Existing 4-ch simulcast sites with DCPs

LEGEND

- Control Site
- RF 'Multicast' Site
- RF Simulcast Site
- Dispatch/Control Stations
- NCRN Sites
- RWIS Sites
- Site-on-Wheels

HARRIS — Communication Systems Division, Public Safety & Professional Communications

CRM# 16CS02712

PRELIMINARY ENGINEERING SKETCH
COMPANY CONFIDENTIAL

HIGH-LEVEL SYSTEM BLOCK DIAGRAM - NORTH CONNECT

PREPARED BY: A. OGDEN
DATE: 7/25/2018
SKETCH #: 16CS02712

Nevada Shared Radio System

VIDA Connect Core – South
(57 RF Sites)

FAST Center (NDOT)
Primary VIDA Connect Core - South

Primary VIDA Connect Core Includes;
VIDA Application Server (VAS)
-Network Switching (NSS1) VM
-Enterprise Network Manager VM
-Regional Network Mgr VM
-Regional Site Mgr VM
-Active Directory VM
-BeOn VM[1]
- KMF VM[1]
-SUMS Server[1]
-Transcoder VM
-ISSI VM[1]
-StatusAware VM[1]

Router
Redundant Logging Recorders (NDOT) (2 X 296 Talkpaths)
Redundant Logging Recorders (DPS) (2 X 72 Talkpaths)
Interoperability Gateway 36 Talkpaths
Customer Provided Ethernet Backhaul Connections

Existing/New NCRN Sites - South

700 MASTR V 4 Channels
Site-on-Wheels (NDOT)

800 TB9400 1 Channel - Conv
Site-on-Wheels (NDOT)

To co-located SAR
800/VHF Cross-Band Repeater

Fitzpatrick (NDOT)
Highland Pk (NDOT)
Mt Brock (NDOT)
Pilot Pk (NDOT)
Sober Pk (NDOT)
TV Hill (NDOT)
Warm Springs (NDOT)
Caliente[3] (NDOT)
Currant Summit[3] (NDOT)
Mesquite[3] (NDOT)
Overton[3] (NDOT)
(11 Sites)

Existing RWIS Sites - South

Mt Brock (NDOT)
Currant Summit (NDOT)
Pilot Pk (NDOT)
(3 Sites)

700 MASTR V 4 Channels
Site-on-Wheels (NDOT)

Beltway (NDOT)
Secondary VIDA Connect Core - South

Router
New Asset Management System (NVE)

Secondary VIDA Connect Core Includes;
VIDA Application Server (VAS)
-Network Switching (NSS2) VM
-Enterprise Network Manager VM
-Regional Network Mgr VM
-Regional Site Mgr VM
-Active Directory VM
-BeOn VM[1]
-Transcoder VM
-ISSI VM[1]

Redundant Logging Recorders (NVE) (2 X 176 Talkpaths)

FAST Center - South (DPS)

(10) New Control Stations

Multiple Dispatch Locations - South (NDOT)

Redundant Routers
New Symphony Consoles (4)
Existing Symphony Consoles[4] (11)

Beltway Dispatch - South (NVE)

Redundant Routers
New Symphony Consoles (6)
Existing Symphony Consoles[4] (9)

NSRS Provided Backhaul

Redundant Routers
MASTR V 3 Channels
Buckskin, UT (NVE)
Page, AZ (NVE)
Pipe Springs, AZ (NVE)
(3 Sites)

Redundant Routers
MASTR V 4 Channels
Blue Diamond (NVE)
Mt Charleston (NVE)
Pahranagat[5] (NVE)
Red Mtn (NVE)
Beaver Dam, UT (NVE)
Alamo (NDOT)
Amargosa (NDOT)
Caliente (NDOT)
Currant Summit (NDOT)
Fitzpatrick[2] (NDOT)
Hoover Dam (NDOT)
Indian Springs[6] (NDOT)
Millers (NDOT)
Mtn Springs (NDOT)
Mt Irish[2] (NDOT)
Montezuma (NDOT)
Palmetto (NDOT)
Pilot Peak (NDOT)
Ragged Ridge (NDOT)
Schader[2] (NDOT)
Sober (NDOT)
Timber[2] (NDOT)
Deer Creek (NDOT)
Tempiute (NDOT)
White River (NDOT)
(25 Sites)

Redundant Routers
MASTR V 5 Channels
Highland Peak (NDOT)
Kinkaid (NDOT)
Mercury (NDOT)
Sunnyside (NDOT)
Warm Springs (NDOT)
Wilson (NDOT)
(6 Sites)

Redundant Routers
MASTR V 6 Channels
Christmas Tree (NVE)
Laughlin (NVE)
Coyote Springs (NDOT)
Mesquite (NDOT)
Sawtooth (NDOT)
(5 Sites)

Redundant Routers
MASTR V 7 Channels
Big Horn (NVE)
Opal (NVE)
Brock (NDOT)
(3 Sites)

Redundant Routers
MASTR V 8 Channels
Angel's Pk (NVE)
Potosi (NVE)
(2 Sites)

Redundant Routers
MASTR V 10 Channels
Sloan (NVE)
(1 Site)

P25 Simulcast Systems

Beltway, Cabana, Cheyenne, Decatur, Durango, Ryan Center, Washington & Westside (NVE)
Redundant Routers
MASTR V 16 Channels
(2) DCPs

Apex & Lenzie (NVE)
Redundant Routers
(2) DCPs
MASTR V 5 Channels

Glendale & Reid Gardner (NVE)
Redundant Routers
(2) DCPs
MASTR V 9 Channels

[1]These features are housed on the VIDA Premier Core
[2]Solar sites (MASTR V @ 20W)
[3]New NCRN Sites
[4]Software upgrade needed
[5]Virtual site, no MASTR V
[6]NVE to maintain

LEGEND

- Control Site
- RF 'Multicast' Site
- RF Simulcast Site
- Dispatch/Control Stations
- NCRN Sites
- RWIS Sites
- Site-on-Wheels

HARRIS Communication Systems Division Public Safety & Professional Communications

CRM# 16CS02712

PRELIMINARY ENGINEERING SKETCH
COMPANY CONFIDENTIAL

HIGH-LEVEL SYSTEM BLOCK DIAGRAM - SOUTH CONNECT

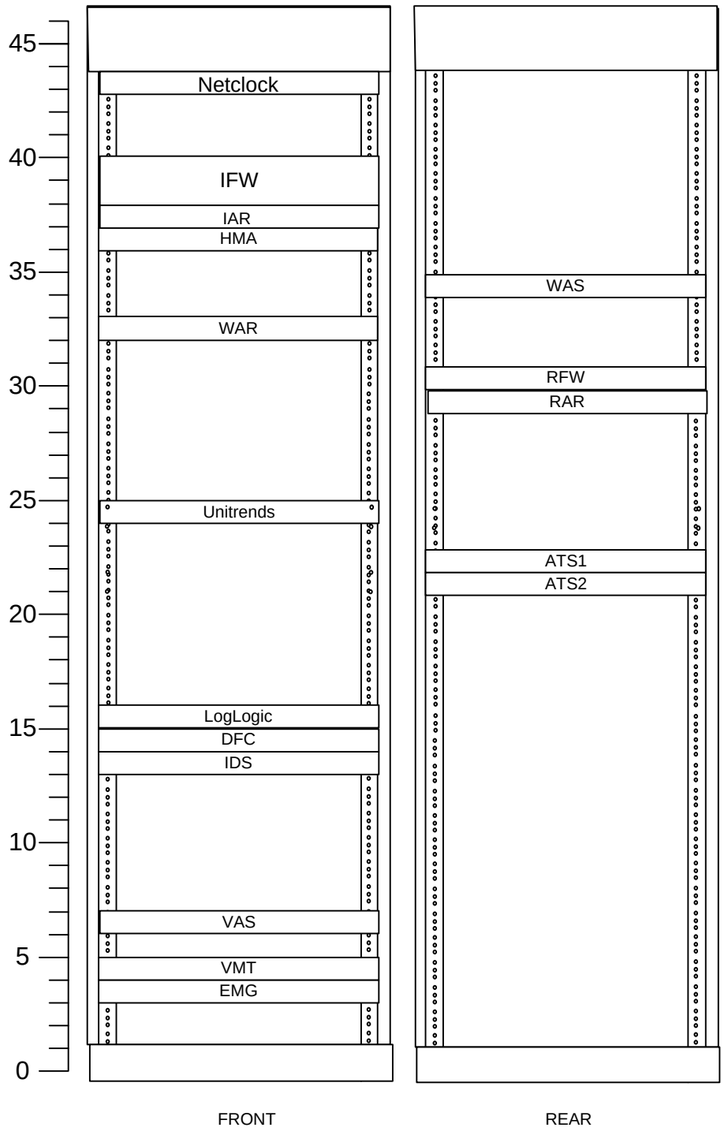
PREPARED BY: A. OGDEN
DATE: 7/25/2018
SKETCH #: 16CS02712

Nevada Shared Radio System

SHEET # 4 OF 21

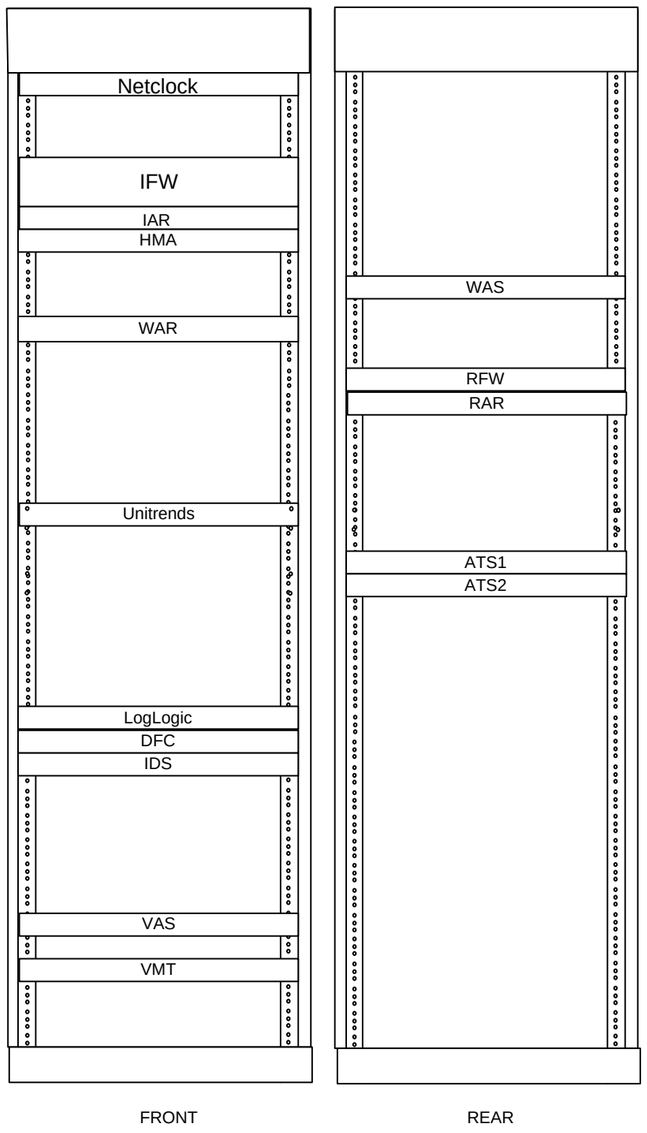
VIDA Premier Cores – High Availability

NDOT – Las Vegas SANS



Primary NSC Rack

Washoe – Washoe NOC



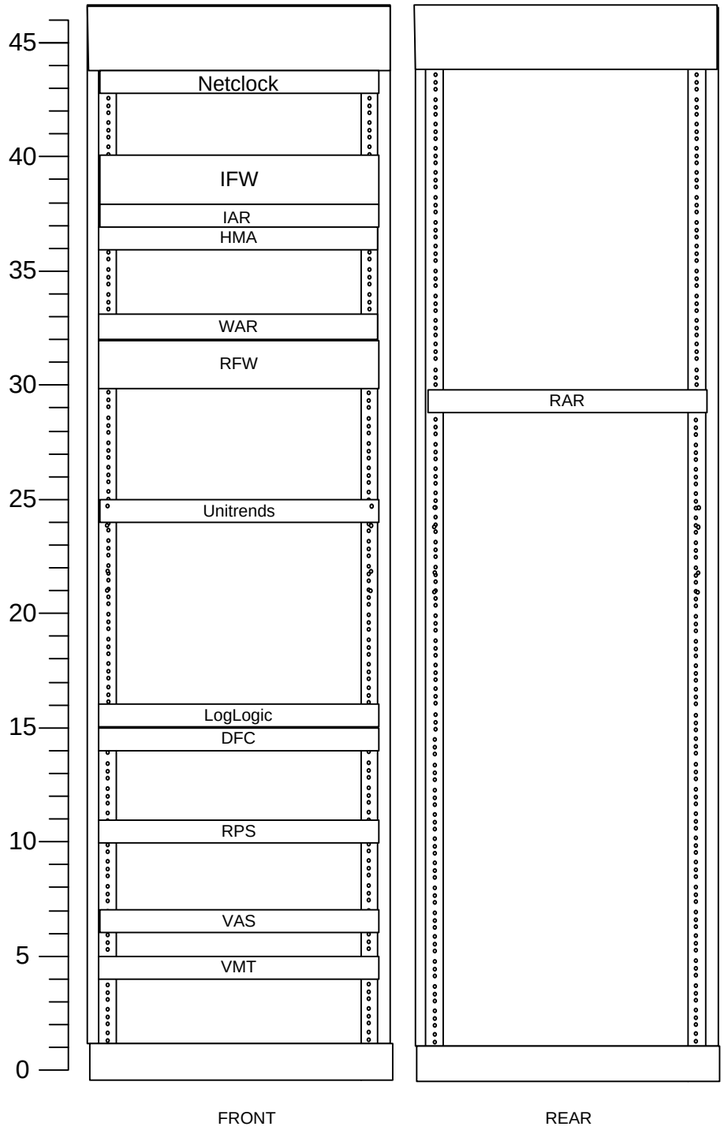
Secondary NSC Rack

NOTES:
(1) THIS IS A REPRESENTATIVE DRAWING. INSTALLED EQUIPMENT AND RACKUP TO BE DETERMINED DURING FINAL SYSTEM DESIGN.

HARRIS Communication Systems Division, Public Safety & Professional Communications	CRM# 16CS02712
PRELIMINARY ENGINEERING SKETCH COMPANY CONFIDENTIAL	NDOT/Washoe VIDA Premier Rack-up
PREPARED BY: A. OGDEN	
DATE: 7/25/2018	Nevada Shared Radio System
SKETCH #: 16CS02712	SHEET # 5 OF 21

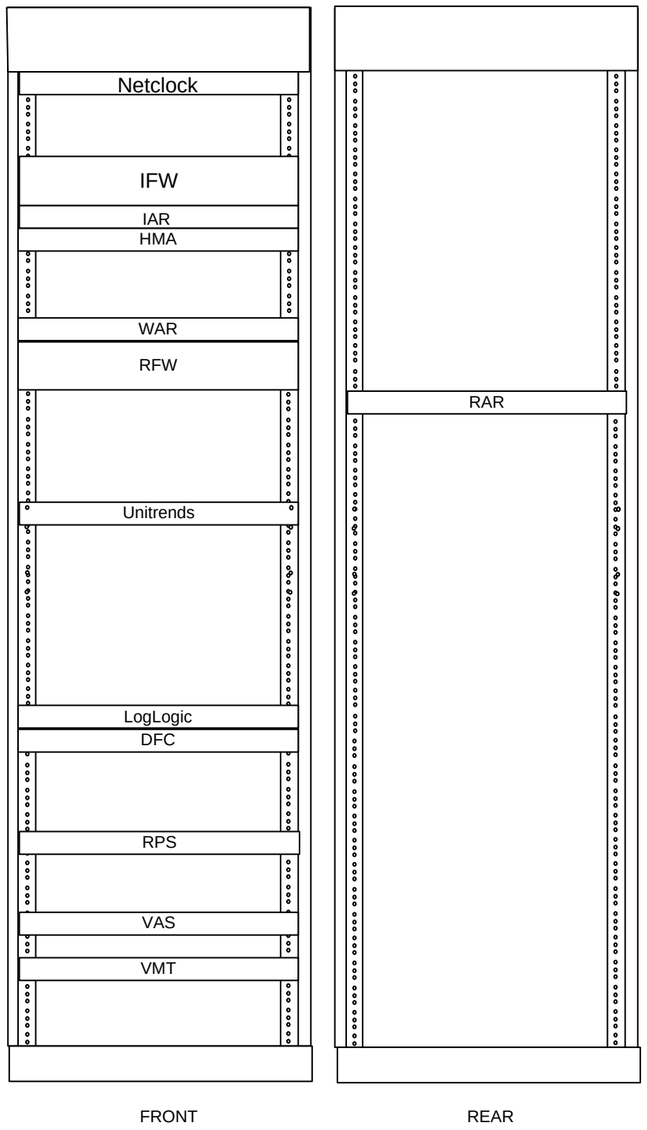
VIDA Connect Core (North) – High Availability

Washoe – Washoe NOC



Primary NSC Rack

NVE – Edison



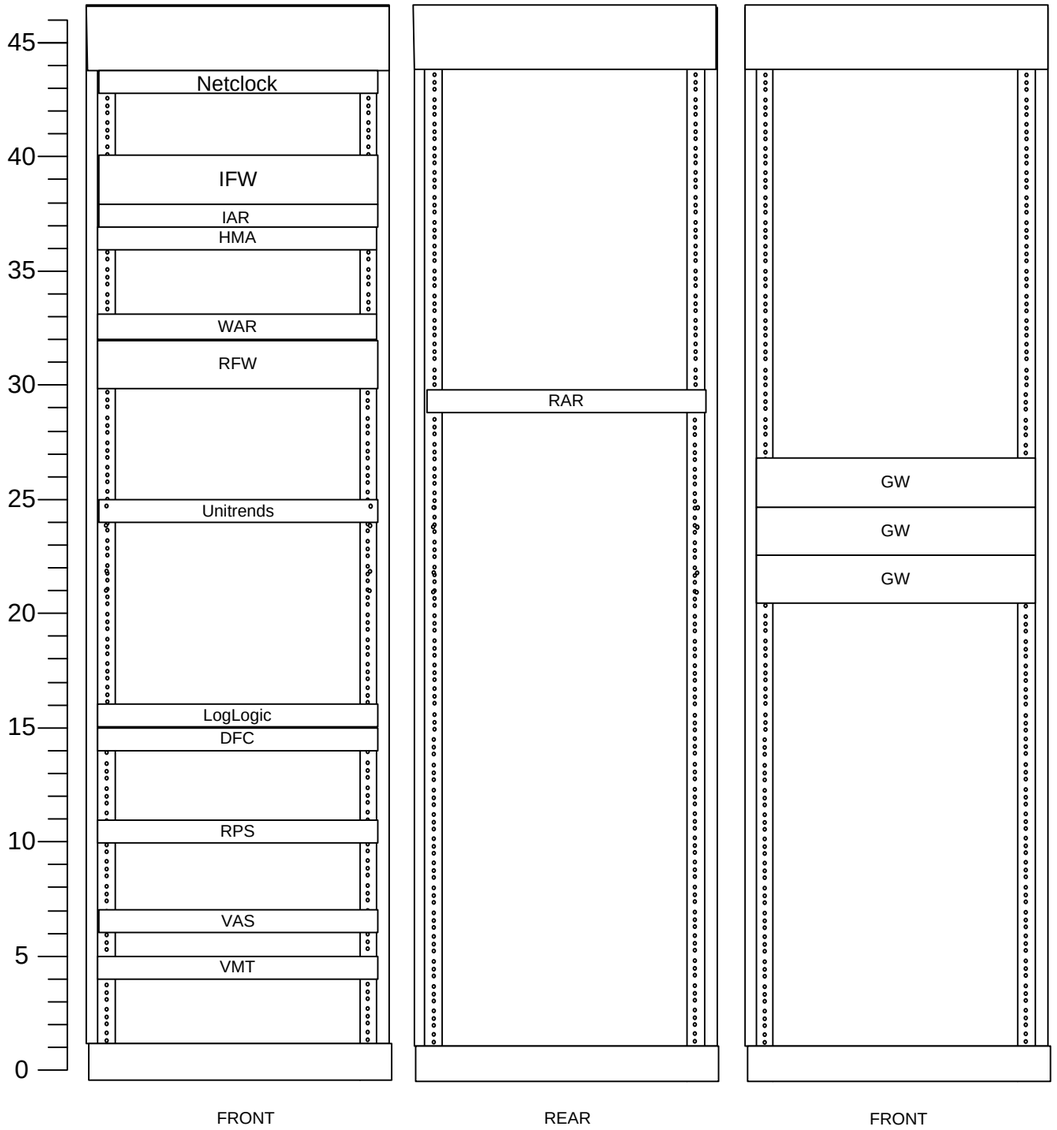
Secondary NSC Rack

NOTES:
(1) THIS IS A REPRESENTATIVE DRAWING. INSTALLED EQUIPMENT AND RACKUP TO BE DETERMINED DURING FINAL SYSTEM DESIGN.

HARRIS — Communication Systems Division, Public Safety & Professional Communications	CRM# 16CS02712
PRELIMINARY ENGINEERING SKETCH COMPANY CONFIDENTIAL	WASHOE/NVE VIDA CONNECT (NORTH) RACK-UP
PREPARED BY: A. OGDEN	
DATE: 7/25/2018	Nevada Shared Radio System
SKETCH #: 16CS02712	SHEET # 6 OF 21

VIDA Connect Core (South) – High Availability

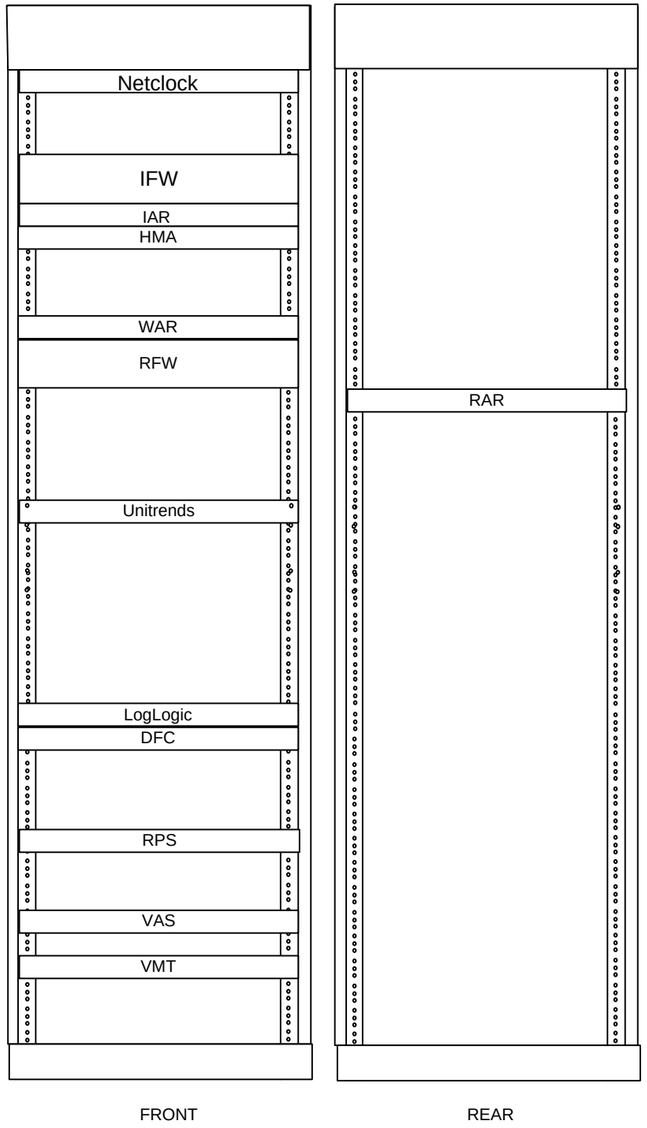
NDOT – FAST Center



Primary NSC Rack

Interoperability Rack

NDOT - Beltway



Secondary NSC Rack

NOTES:
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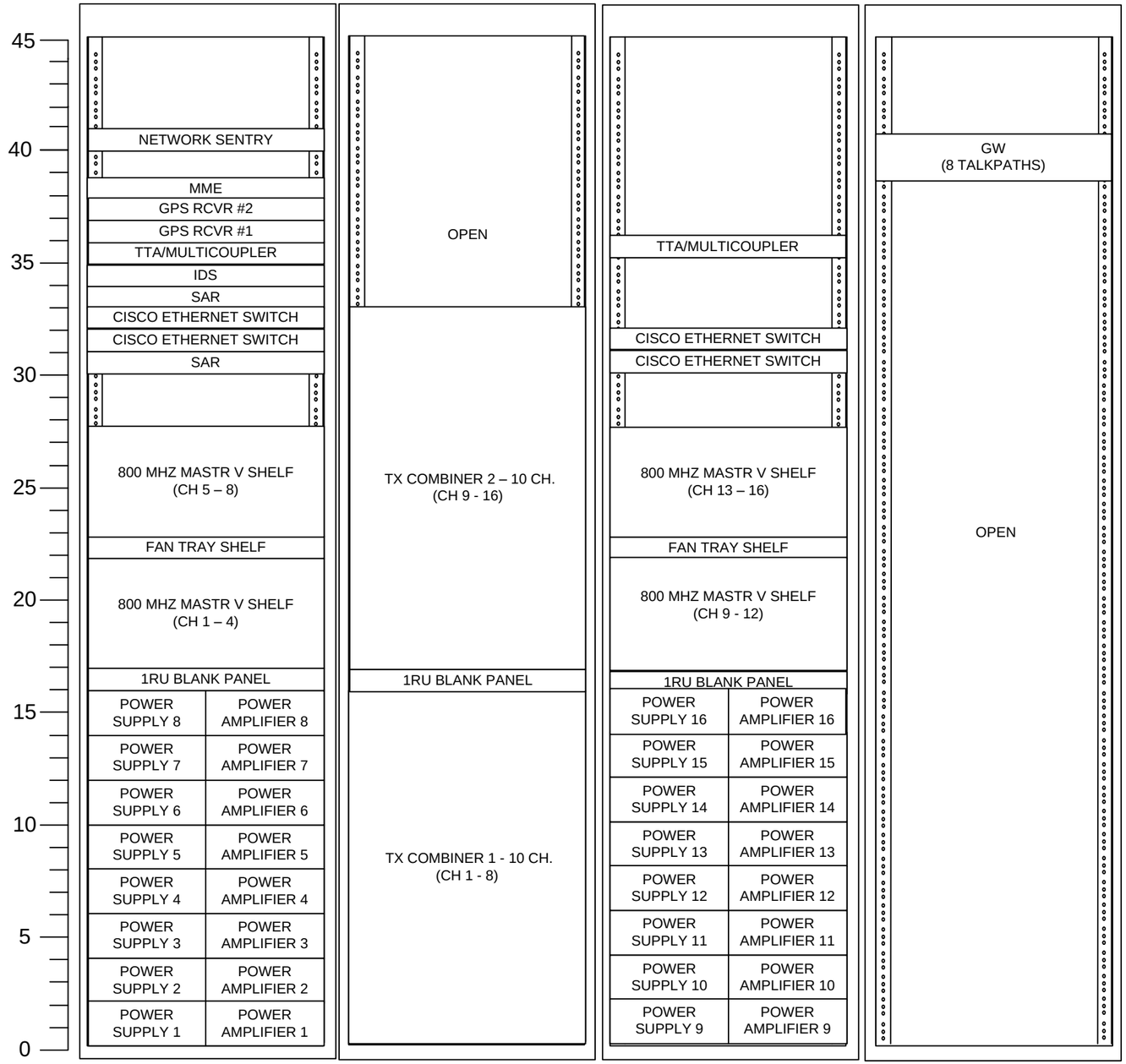
HARRIS Communication Systems Division Public Safety & Professional Communications	CRM# 16CS02712
PRELIMINARY ENGINEERING SKETCH COMPANY CONFIDENTIAL	NDOT VIDA Connect (South) Rack-up
PREPARED BY: A. OGDEN	
DATE: 7/25/2018	Nevada Shared Radio System
SKETCH #: 16CS02712	SHEET # 7 OF 21

P25T Phase 2 Simulcast RF Site Rack-up

16 Channel, 3 Sites P25 IP Simulcast
(Peavine – DCP (Washoe)^2, Red Peak – DCP (Washoe)^2, Chimney Peak (NVE))

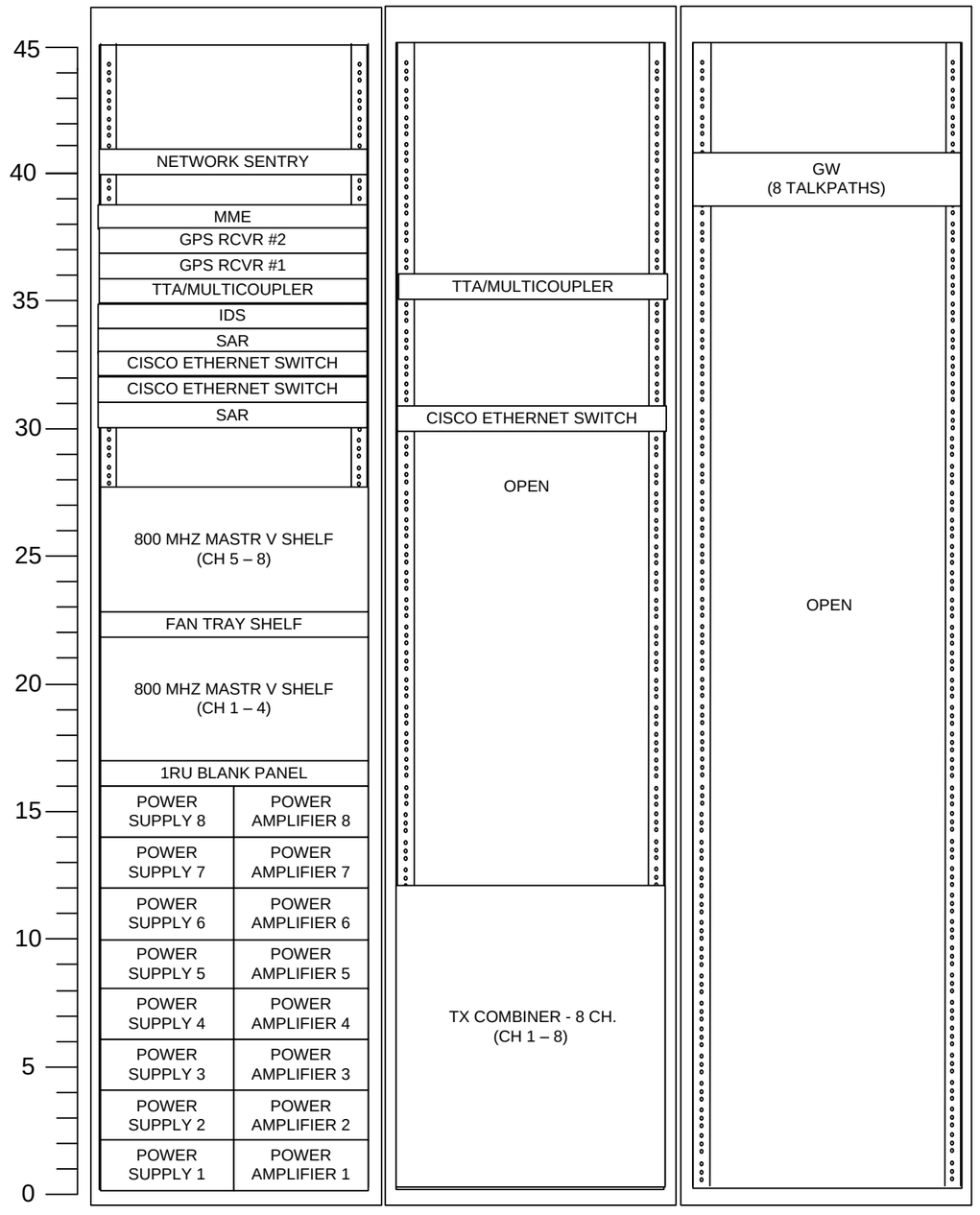


NOTES:
(1) THIS IS A REPRESENTATIVE DRAWING. INSTALLED EQUIPMENT AND RACKUP TO BE DETERMINED DURING FINAL SYSTEM DESIGN.
(2) EXISTING 2-SITE, 4-CH DCP SIMULCAST SITE
(3) DISTRIBUTION PANELS ARE INSTALLED ON THE BACK OF THE RACKS, NOT SHOWN.

HARRIS Communication Systems Division Public Safety & Professional Communications	CRM# 16CS02712
PRELIMINARY ENGINEERING SKETCH COMPANY CONFIDENTIAL	WASHOE SIMULCAST (WC) - RACK-UP
PREPARED BY: A. OGDEN	
DATE: 7/25/2018	Nevada Shared Radio System
SKETCH #: 16CS02712	SHEET # 8 OF 21

P25T Phase 2 Simulcast RF Site Rack-up

8 Channel, 2 Sites, P25 IP Simulcast
(Biltmore – DCP and Snowflake – DCP)
(Washoe)

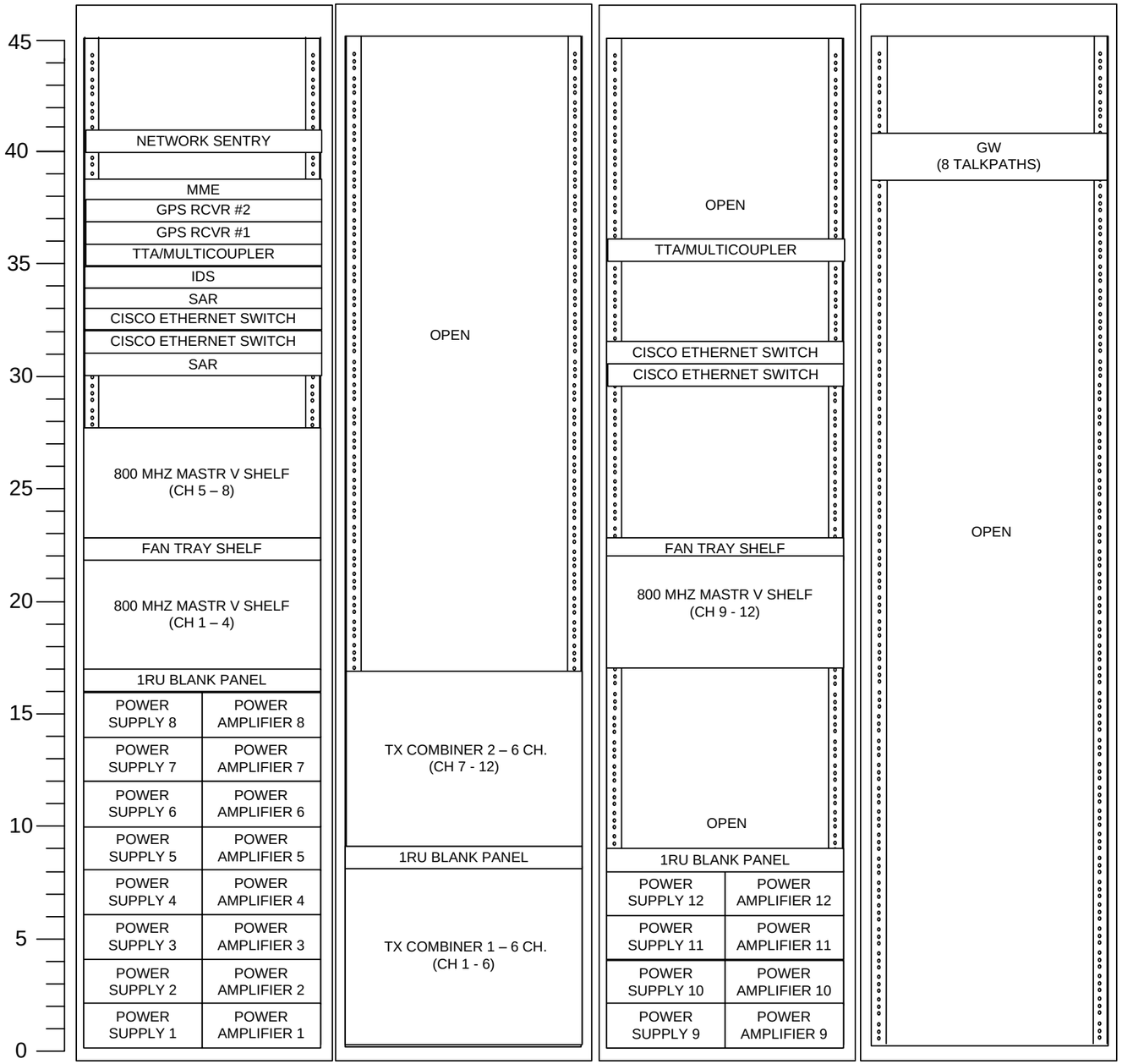


NOTES:
(1) THIS IS A REPRESENTATIVE DRAWING. INSTALLED EQUIPMENT AND RACKUP TO BE DETERMINED DURING FINAL SYSTEM DESIGN.
(2) DISTRIBUTION PANELS ARE INSTALLED ON THE BACK OF THE RACKS, NOT SHOWN.

HARRIS Communication Systems Division Public Safety & Professional Communications	CRM# 16CS02712
PRELIMINARY ENGINEERING SKETCH COMPANY CONFIDENTIAL	TAHOE SIMULCAST (WC) - RACK-UP
PREPARED BY: A. OGDEN	
DATE: 7/25/2018	Nevada Shared Radio System
SKETCH #: 16CS02712	SHEET # 9 OF 21

P25T Phase 2 Simulcast RF Site Rack-up

12 Channel, 2 Sites P25 IP Simulcast
(Slide Mtn – DCP and Mt Rose – DCP)
(Washoe)



NOTES:
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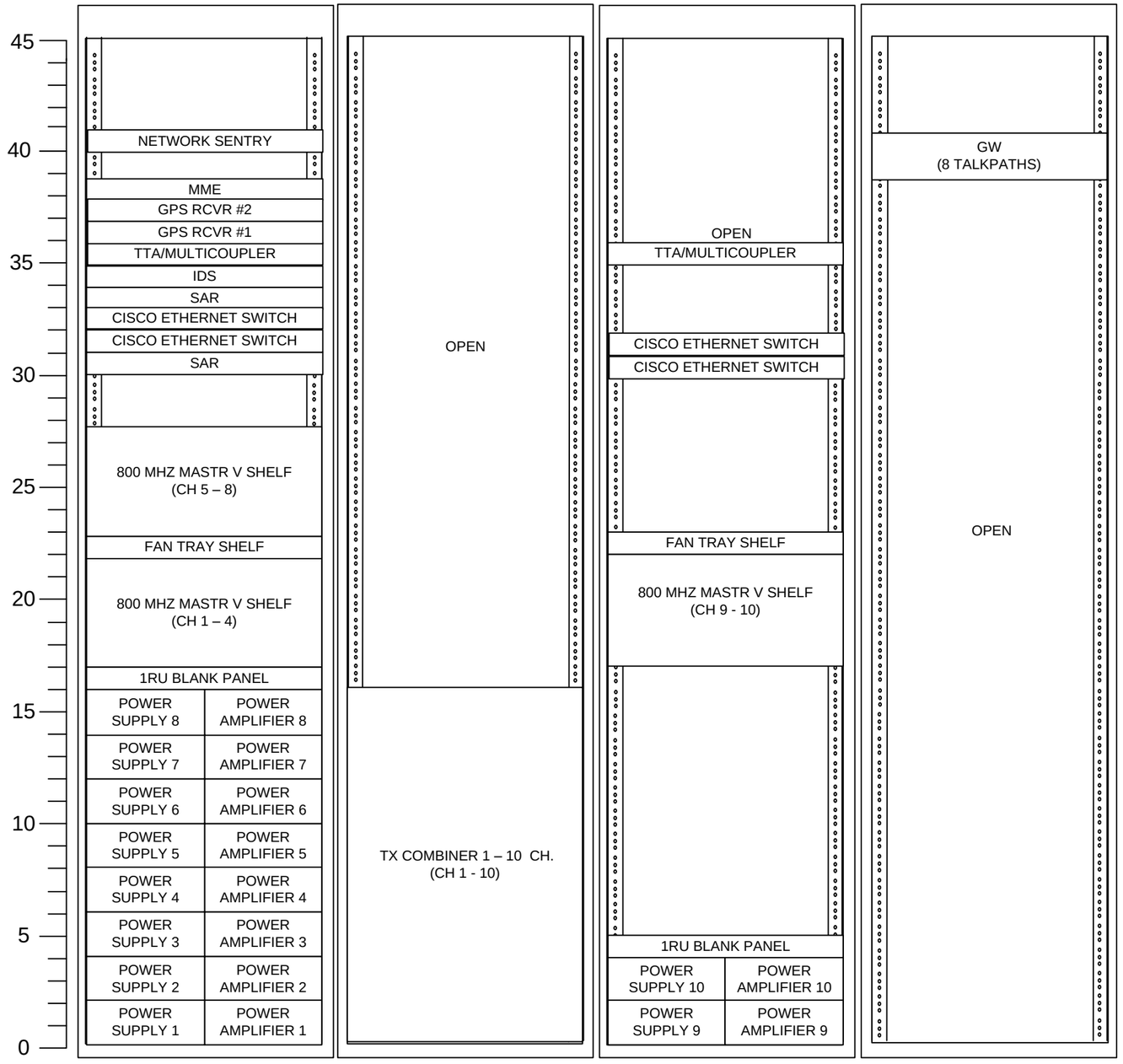
(2) DISTRIBUTION PANELS ARE INSTALLED ON THE BACK OF THE RACKS, NOT SHOWN.

HARRIS Communication Systems Division Public Safety & Professional Communications	CRM# 16CS02712
PRELIMINARY ENGINEERING SKETCH COMPANY CONFIDENTIAL	SOUTH SIMULCAST - RACK-UP
PREPARED BY: A. OGDEN	Nevada Shared Radio System
DATE: 7/25/2018	
SKETCH #: 16CS02712	SHEET # 10 OF 21

P25T Phase 2 Simulcast RF Site Rack-up

10 Channels, 2 Sites P25 IP Simulcast
(Virginia Peak – DCP and Marble Bluff – DCP)
(Washoe)



NOTES:
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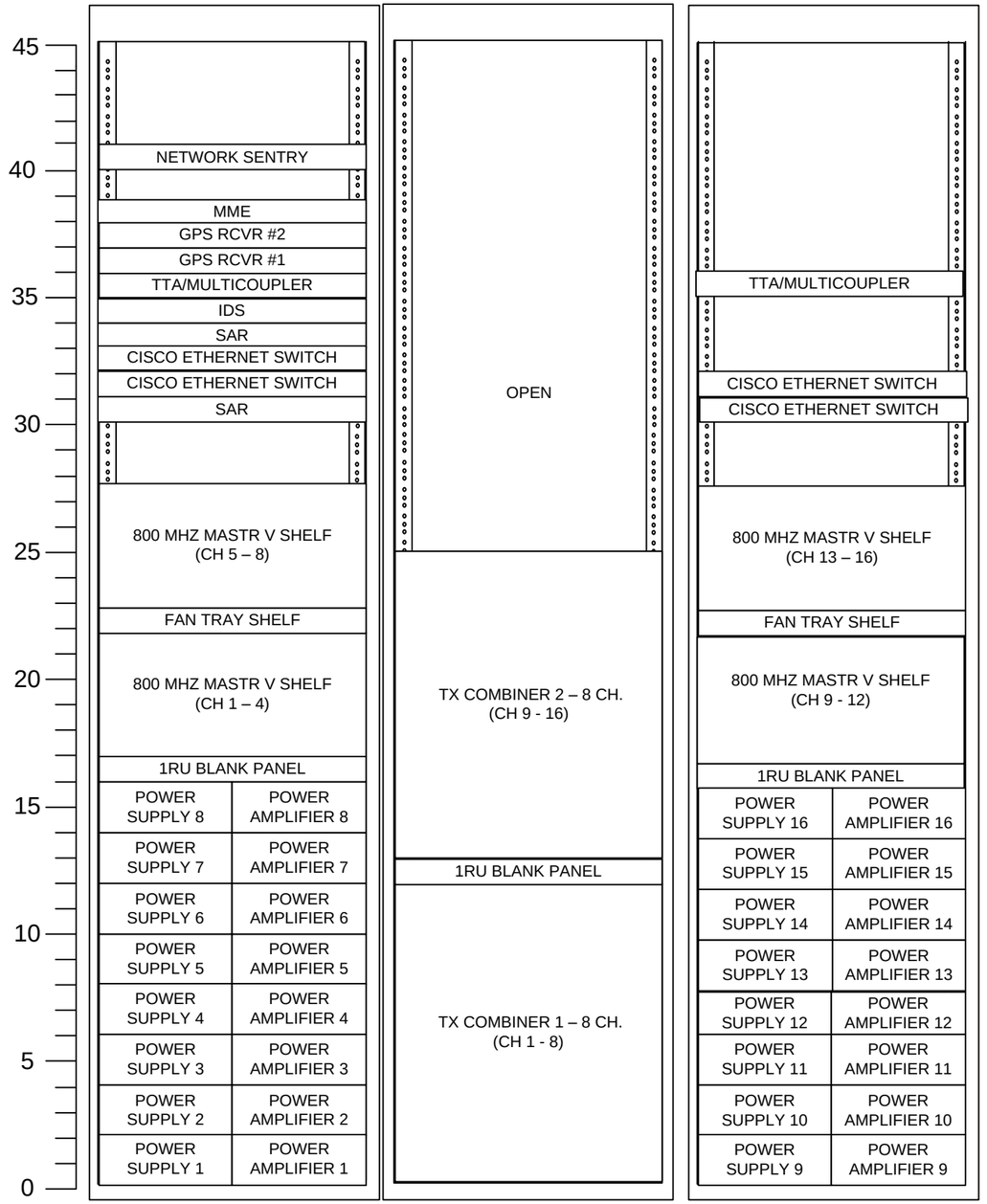
(2) DISTRIBUTION PANELS ARE INSTALLED ON THE BACK OF THE RACKS, NOT SHOWN.

HARRIS Communication Systems Division Public Safety & Professional Communications	CRM# 16CS02712
PRELIMINARY ENGINEERING SKETCH COMPANY CONFIDENTIAL	PYRAMID SIMULCAST - RACK-UP
PREPARED BY: A. OGDEN	Nevada Shared Radio System
DATE: 7/25/2018	
SKETCH #: 16CS02712	SHEET # 11 OF 21

P25T Phase 2 Simulcast RF Site Rack-up

16 Channel, 8 Sites, P25 IP Simulcast
(Beltway, Cabana, Cheyenne, Decatur, Durango - DCP, Ryan Center, Washington, Westside - DCP)
(NVE)

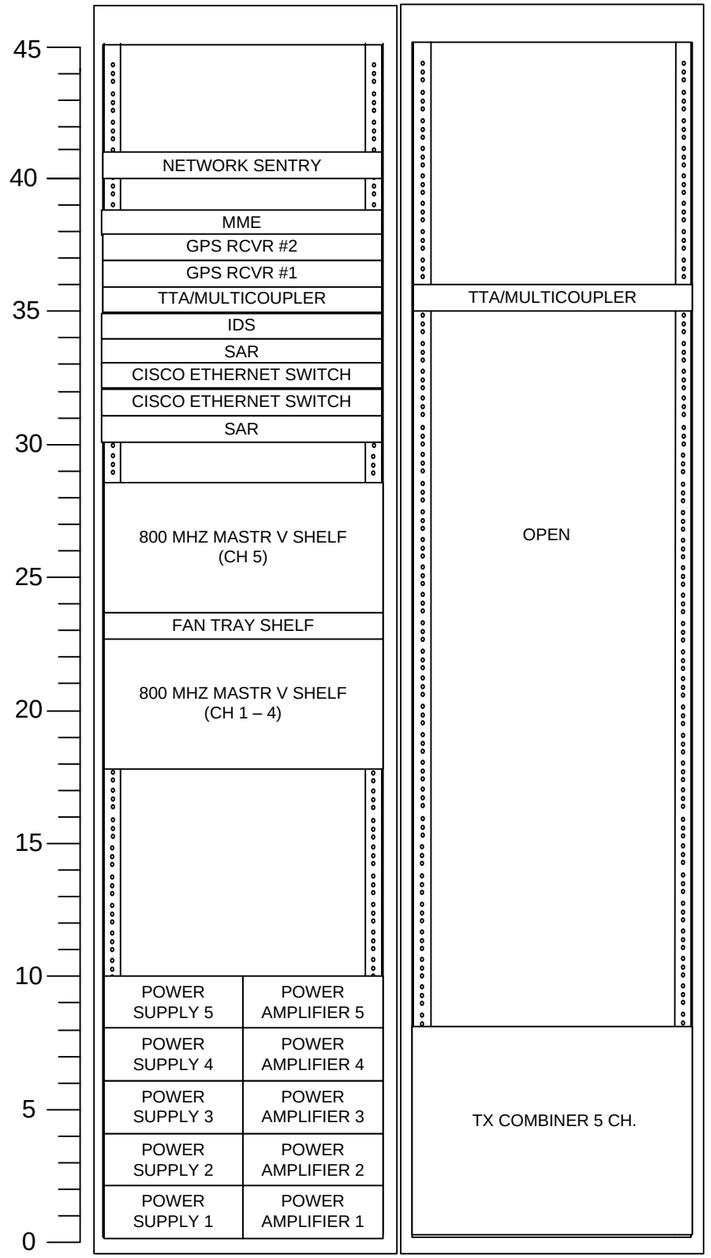


NOTES:
(1) THIS IS A REPRESENTATIVE DRAWING. INSTALLED EQUIPMENT AND RACKUP TO BE DETERMINED DURING FINAL SYSTEM DESIGN.
(2) DISTRIBUTION PANELS ARE INSTALLED ON THE BACK OF THE RACKS, NOT SHOWN.

HARRIS — Communication Systems Division, Public Safety & Professional Communications	CRM# 16CS02712
PRELIMINARY ENGINEERING SKETCH COMPANY CONFIDENTIAL	LAS VEGAS SIMULCAST (NVE) - RACK-UP
PREPARED BY: A. OGDEN	
DATE: 7/25/2018	Nevada Shared Radio System
SKETCH #: 16CS02712	SHEET # 12 OF 21

P25T Phase 2 Simulcast RF Site Rack-up

5 Channel, 2 Sites, P25 IP Simulcast
(Lenzie Plant – DCP, and Apex – DCP)
(NVE)

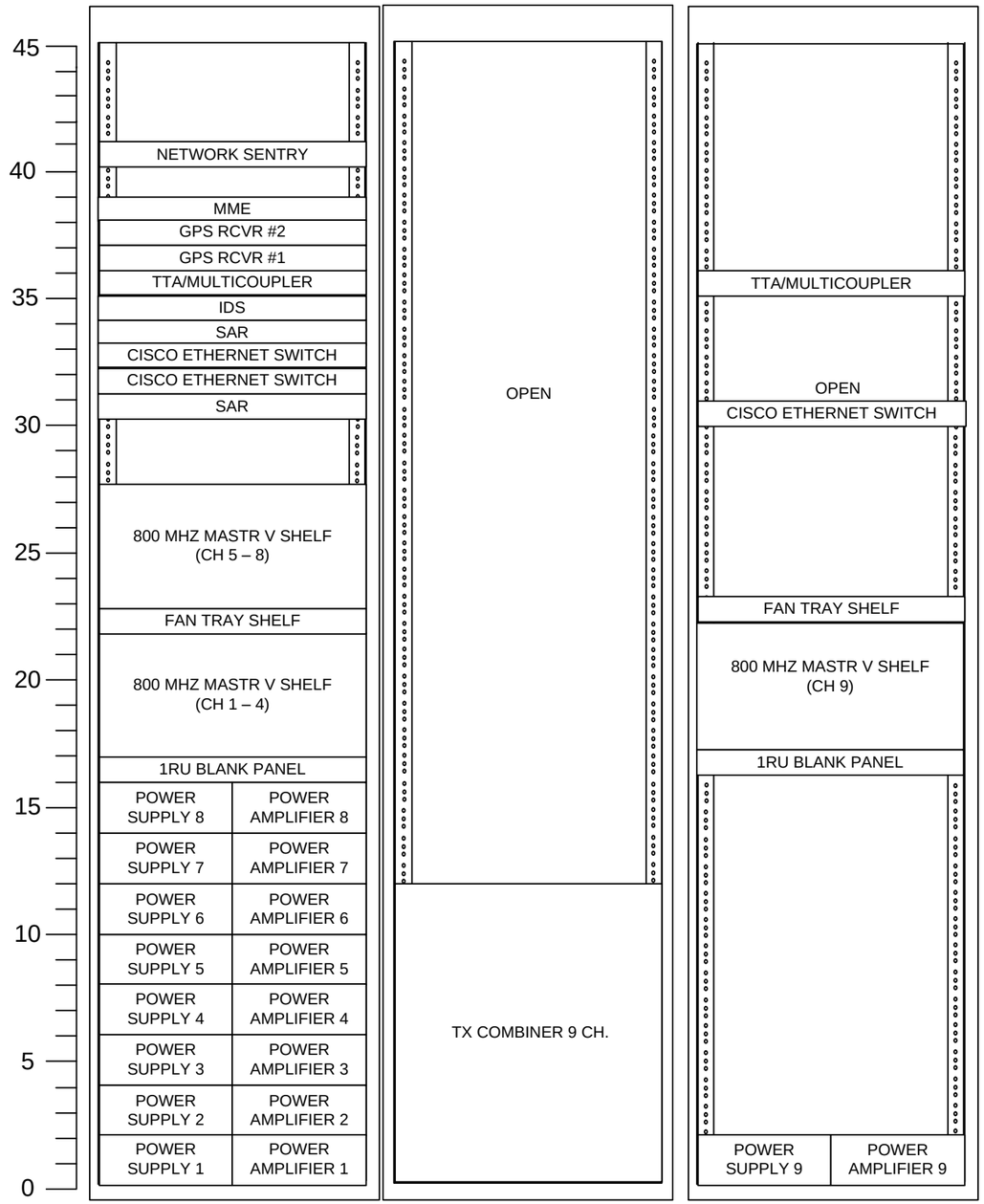


NOTES:
(1) THIS IS A REPRESENTATIVE DRAWING. INSTALLED EQUIPMENT AND RACKUP TO BE DETERMINED DURING FINAL SYSTEM DESIGN.
(2) DISTRIBUTION PANELS ARE INSTALLED ON THE BACK OF THE RACKS, NOT SHOWN.

HARRIS — Communication Systems Division, Public Safety & Professional Communications	CRM# 16CS02712
PRELIMINARY ENGINEERING SKETCH COMPANY CONFIDENTIAL	CLARK CO SIMULCAST (NVE) - RACK-UP
PREPARED BY: A. OGDEN	
DATE: 7/25/2018	Nevada Shared Radio System
SKETCH #: 16CS02712	SHEET # 13 OF 21

P25T Phase 2 Simulcast RF Site Rack-up

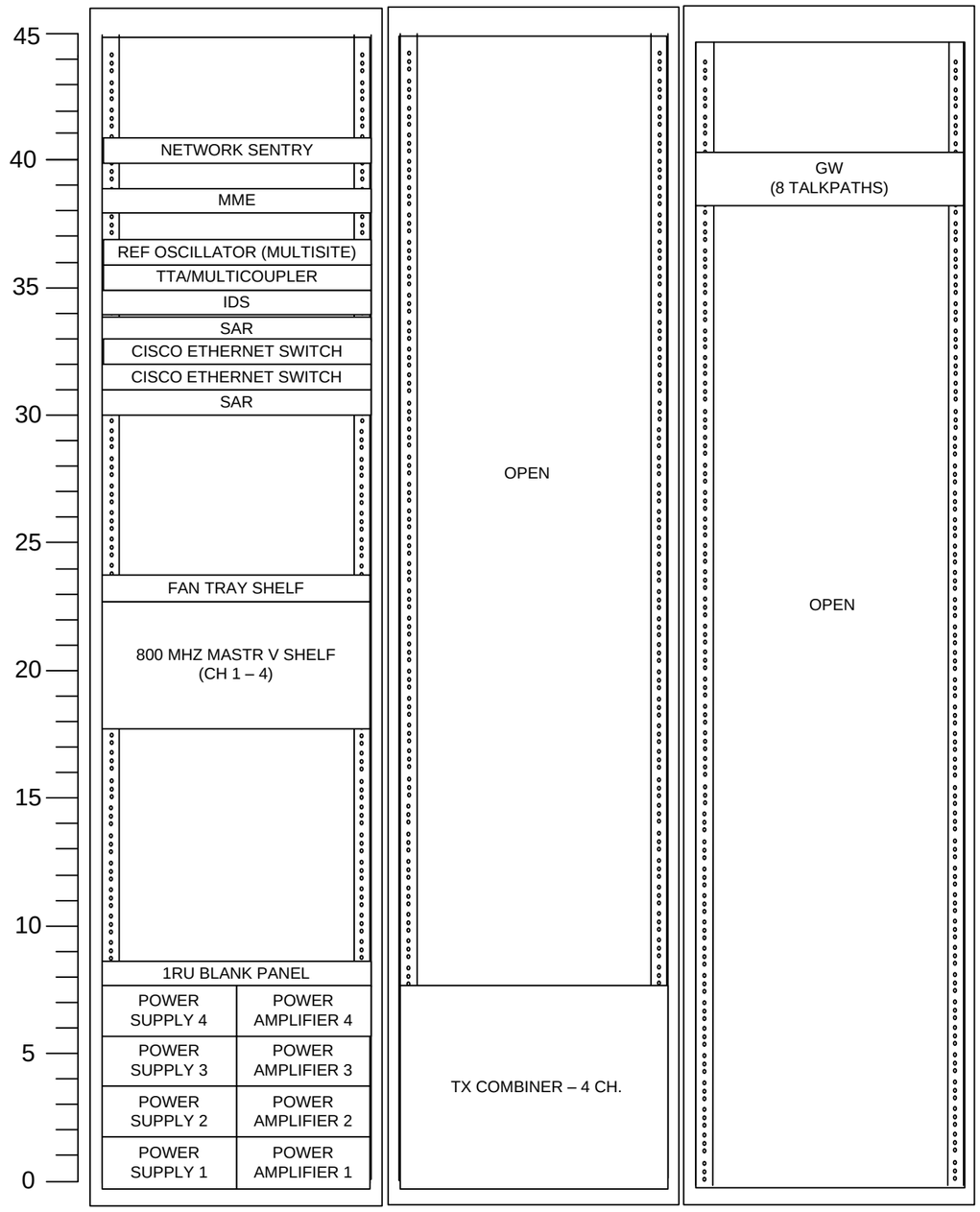
9 Channel, 2 Sites, P25 IP Simulcast
(Glendale – DCP, and Reid Gardner – DCP)
(NVE)



NOTES:
(1) THIS IS A REPRESENTATIVE DRAWING. INSTALLED EQUIPMENT AND RACKUP TO BE DETERMINED DURING FINAL SYSTEM DESIGN.
(2) DISTRIBUTION PANELS ARE INSTALLED ON THE BACK OF THE RACKS, NOT SHOWN.

HARRIS — Communication Systems Division, Public Safety & Professional Communications	CRM# 16CS02712
PRELIMINARY ENGINEERING SKETCH COMPANY CONFIDENTIAL	NVE SIMULCAST 1 - RACK-UP
PREPARED BY: A. OGDEN	
DATE: 7/25/2018	Nevada Shared Radio System
SKETCH #: 16CS02712	SHEET # 14 OF 21

P25 Phase 2 Multisite Rack-up
3 and 4 channels

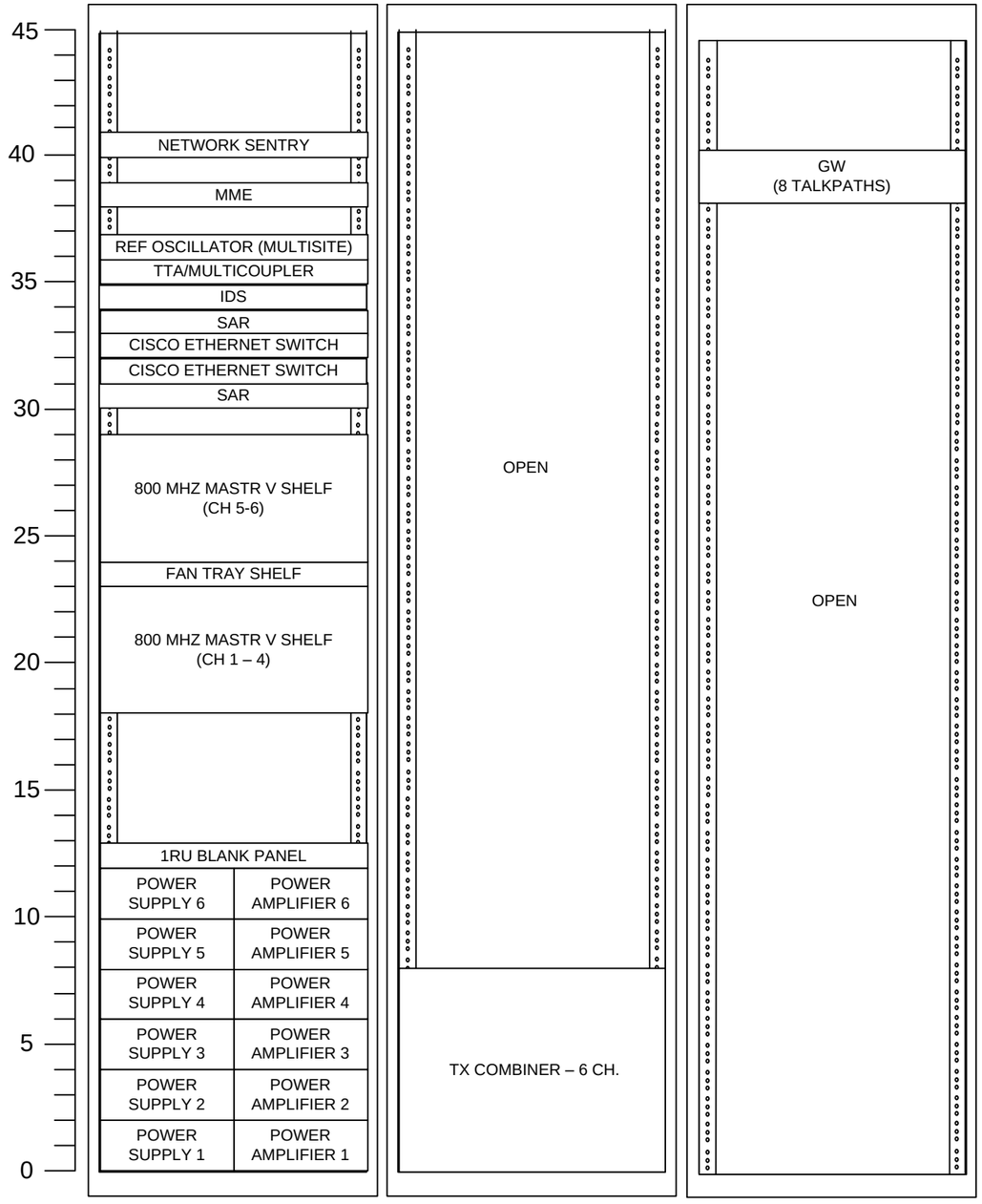


NOTES:

(1) THIS IS A REPRESENTATIVE DRAWING. INSTALLED EQUIPMENT AND RACKUP TO BE DETERMINED DURING FINAL SYSTEM DESIGN.
(2) THE INTEROPERABILITY RACK IS ONLY APPLICABLE FOR WASHOE COUNTY.
(3) DISTRIBUTION PANELS ARE INSTALLED ON THE BACK OF THE RACKS, NOT SHOWN.

HARRIS — Communication Systems Division, Public Safety & Professional Communications	CRM# 16CS02712
PRELIMINARY ENGINEERING SKETCH COMPANY CONFIDENTIAL	MULTI-SITE RACK-UP 3 & 4 CHS
PREPARED BY: A. OGDEN	
DATE: 7/25/2018	Nevada Shared Radio System
SKETCH #: 16CS02712	SHEET # 15 OF 21

P25 Phase 2 Multisite Rack-up
5 and 6 channels

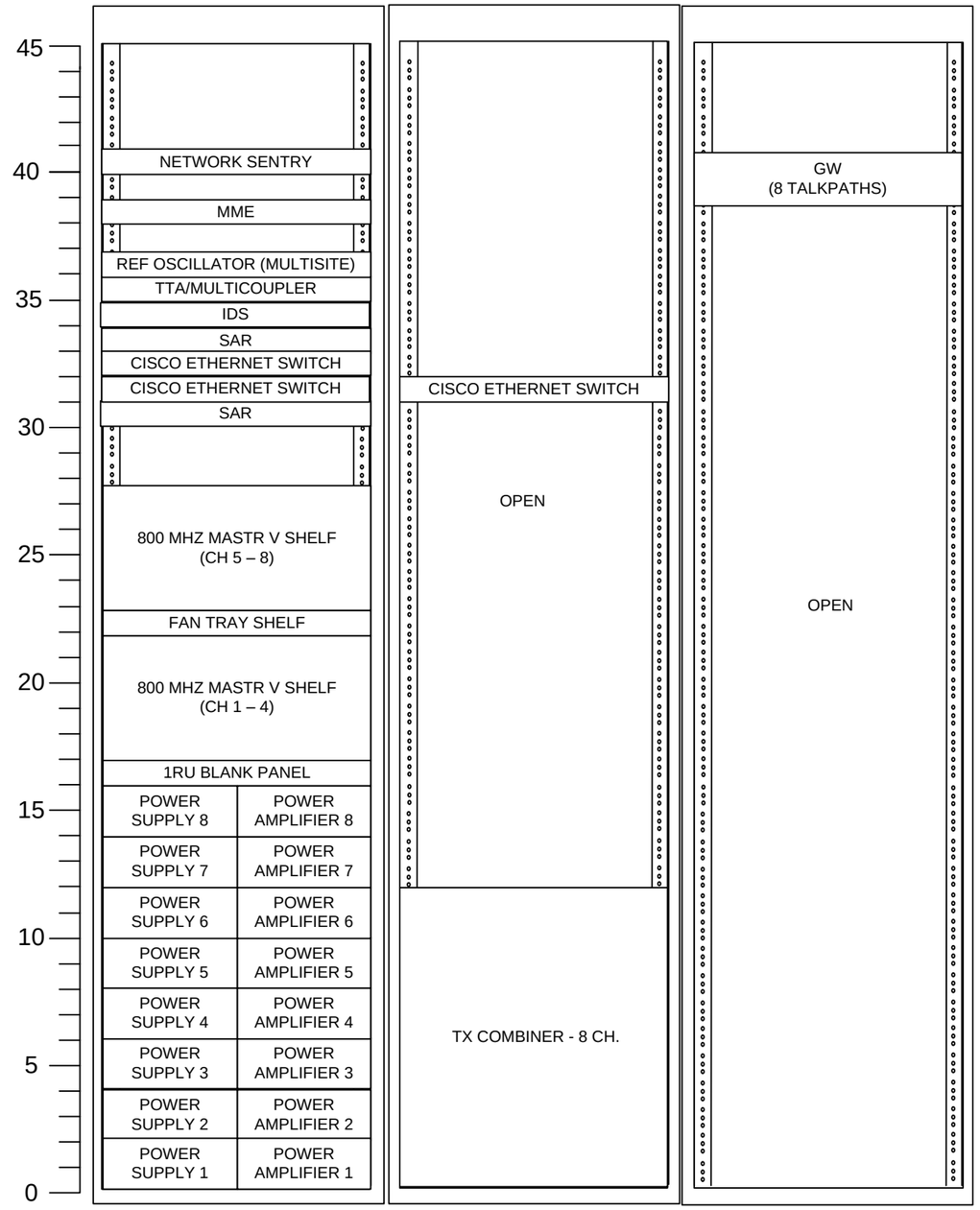


NOTES:

(1) THIS IS A REPRESENTATIVE DRAWING. INSTALLED EQUIPMENT AND RACKUP TO BE DETERMINED DURING FINAL SYSTEM DESIGN.
(2) THE INTEROPERABILITY RACK IS ONLY APPLICABLE FOR WASHOE COUNTY.
(3) DISTRIBUTION PANELS ARE INSTALLED ON THE BACK OF THE RACKS, NOT SHOWN.

HARRIS — Communication Systems Division, Public Safety & Professional Communications	CRM# 16CS02712
PRELIMINARY ENGINEERING SKETCH COMPANY CONFIDENTIAL	MULTI-SITE RACK-UP 5 & 6 CHS
PREPARED BY: A. OGDEN	
DATE: 7/25/2018	Nevada Shared Radio System
SKETCH #: 16CS02712	SHEET # 16 OF 21

P25 Phase 2 Multisite Rack-up
7 and 8 channels

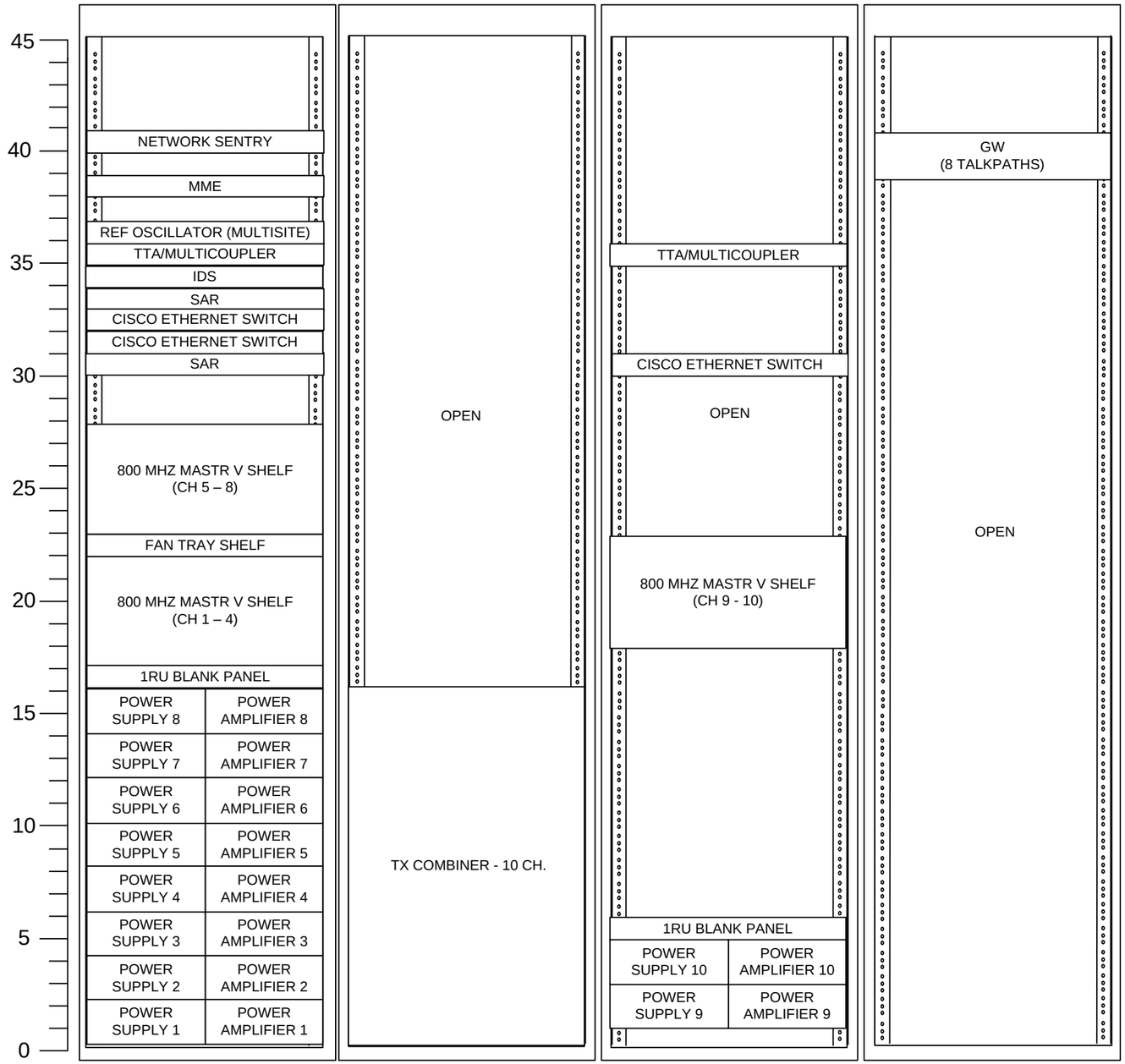


NOTES:

(1) THIS IS A REPRESENTATIVE DRAWING. INSTALLED EQUIPMENT AND RACKUP TO BE DETERMINED DURING FINAL SYSTEM DESIGN.
(2) THE INTEROPERABILITY RACK IS ONLY APPLICABLE FOR WASHOE COUNTY.
(3) DISTRIBUTION PANELS ARE INSTALLED ON THE BACK OF THE RACKS, NOT SHOWN.

HARRIS — Communication Systems Division, Public Safety & Professional Communications	CRM# 16CS02712
PRELIMINARY ENGINEERING SKETCH COMPANY CONFIDENTIAL	MULTI-SITE RACK-UP 7 & 8 CHS
PREPARED BY: A. OGDEN	
DATE: 7/25/2018	Nevada Shared Radio System
SKETCH #: 16CS02712	SHEET # 17 OF 21

P25 Phase 2 Multisite Rack-up
10 channels

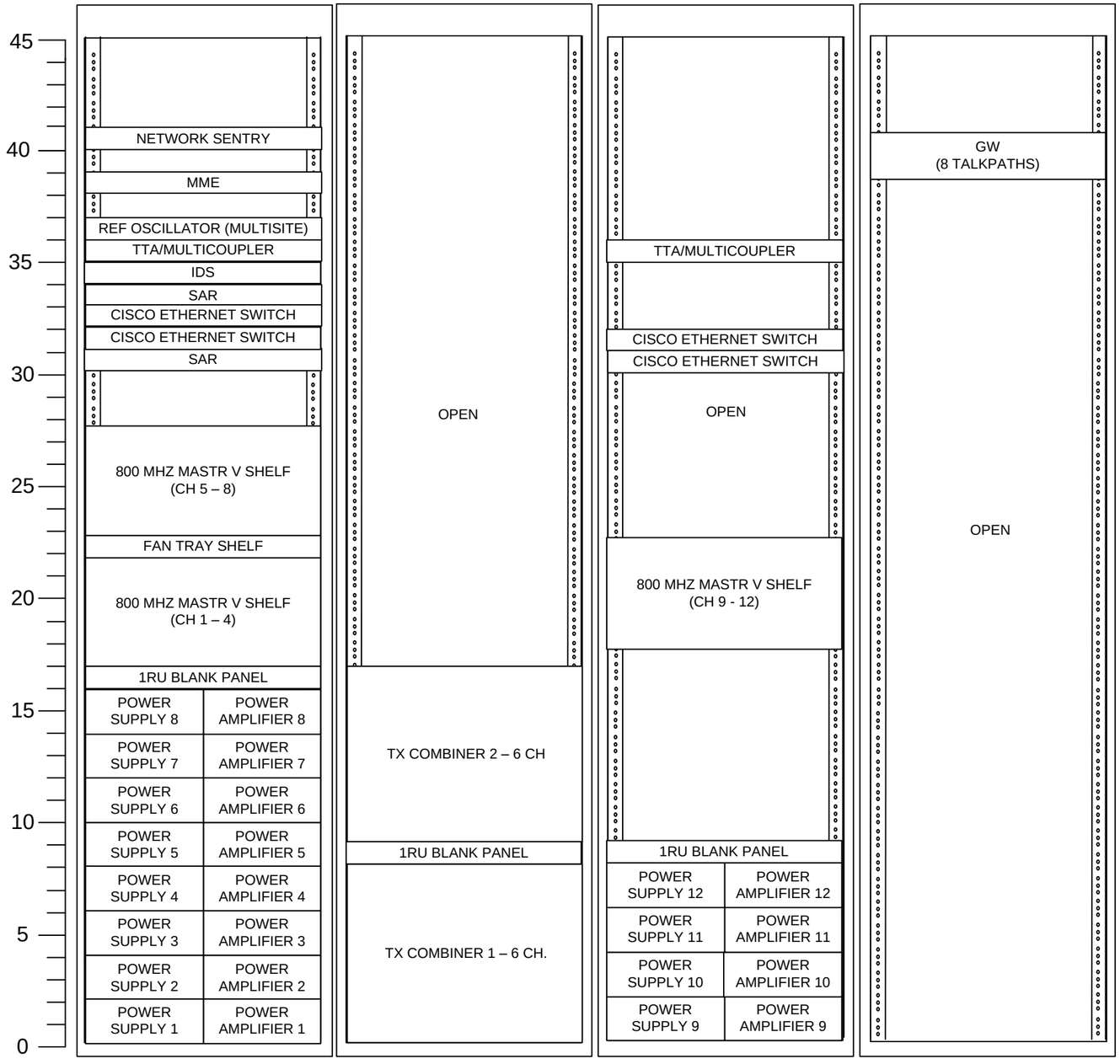


NOTES:

(1) THIS IS A REPRESENTATIVE DRAWING. INSTALLED EQUIPMENT AND RACKUP TO BE DETERMINED DURING FINAL SYSTEM DESIGN.
(2) THE INTEROPERABILITY RACK IS ONLY APPLICABLE FOR WASHOE COUNTY.
(3) DISTRIBUTION PANELS ARE INSTALLED ON THE BACK OF THE RACKS, NOT SHOWN.

HARRIS — Communication Systems Division, Public Safety & Professional Communications	CRM# 16CS02712
PRELIMINARY ENGINEERING SKETCH COMPANY CONFIDENTIAL	MULTI-SITE RACK-UP 10 CHS
PREPARED BY: A. OGDEN	
DATE: 7/25/2018	Nevada Shared Radio System
SKETCH #: 16CS02712	SHEET # 18 OF 21

P25 Phase 2 Multisite Rack-up
12 channels

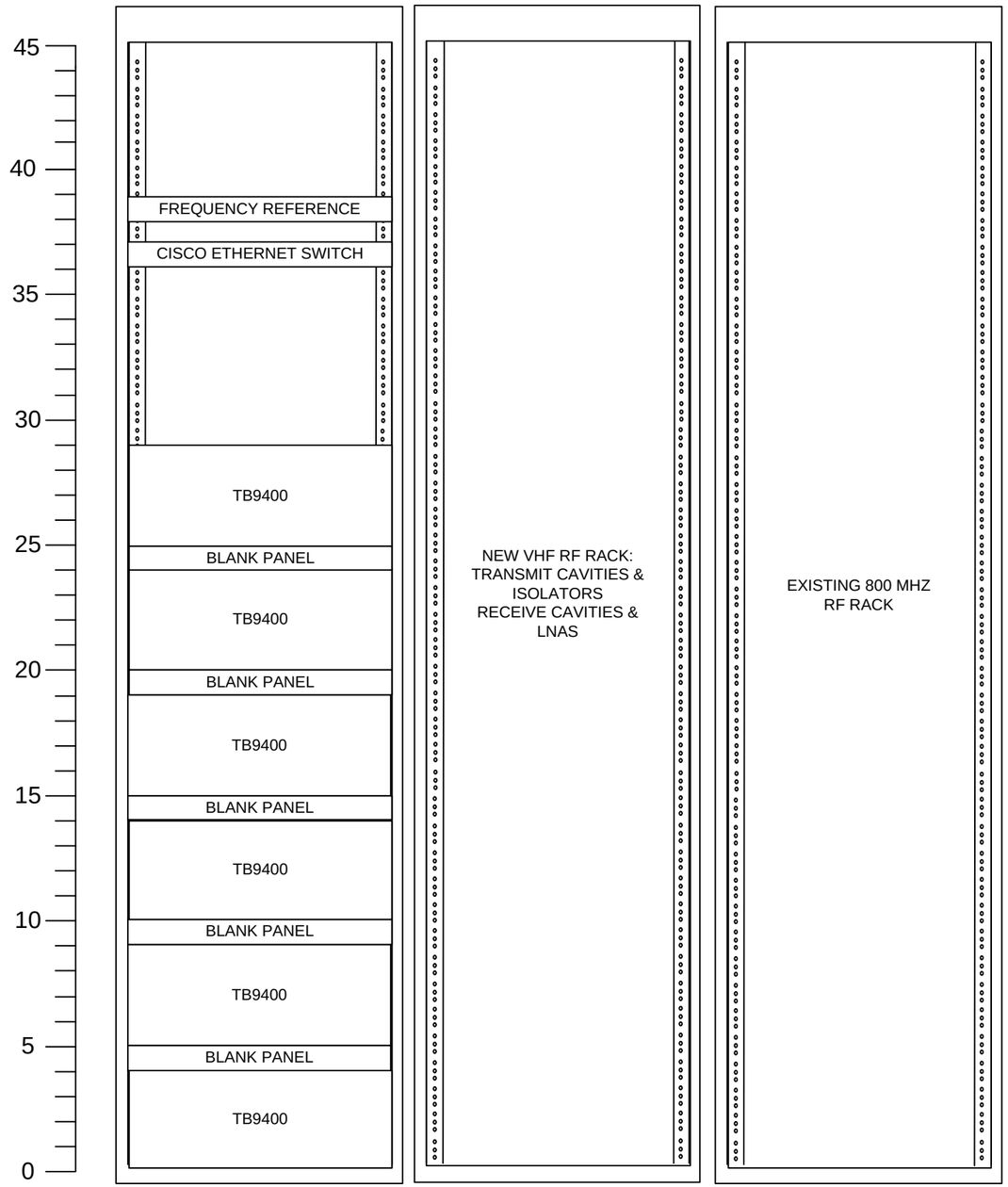


NOTES:

(1) THIS IS A REPRESENTATIVE DRAWING. INSTALLED EQUIPMENT AND RACKUP TO BE DETERMINED DURING FINAL SYSTEM DESIGN.
(2) THE INTEROPERABILITY RACK IS ONLY APPLICABLE FOR WASHOE COUNTY.
(3) DISTRIBUTION PANELS ARE INSTALLED ON THE BACK OF THE RACKS, NOT SHOWN.

HARRIS — Communication Systems Division, Public Safety & Professional Communications	CRM# 16CS02712
PRELIMINARY ENGINEERING SKETCH COMPANY CONFIDENTIAL	MULTI-SITE RACK-UP 12 CHS
PREPARED BY: A. OGDEN	
DATE: 7/25/2018	Nevada Shared Radio System
SKETCH #: 16CS02712	SHEET # 19 OF 21

NCRN – NDOT ONLY
VHF/800 MHz Cross Band Repeaters Site



NOTES:

(1) THIS IS A REPRESENTATIVE DRAWING. INSTALLED EQUIPMENT AND RACKUP TO BE DETERMINED DURING FINAL SYSTEM DESIGN.
(2) THE NCRN RACK IS ONLY APPLICABLE TO NDOT.
(3) THE NCRN SITES WILL REUSE THE EXISTING 800 MHZ EDACS ANTENNA SYSTEM ONCE DECOMMISSIONED, EXCEPT FOR POITO & PEAVINE, WHICH WILL USE THE NEW 800 MHZ P25 ANTENNA SYSTEM.
(4) DISTRIBUTION PANELS ARE INSTALLED ON THE BACK OF THE RACKS, NOT SHOWN.

HARRIS — Communication Systems Division, Public Safety & Professional Communications	CRM# 16CS02712
PRELIMINARY ENGINEERING SKETCH COMPANY CONFIDENTIAL	**NCRN - NDOT ONLY**
PREPARED BY: A. OGDEN	
DATE: 7/25/2018	Nevada Shared Radio System
SKETCH #: 16CS02712	SHEET # 20 OF 21

NSRS Dispatch Centers

Multiple Dispatch Locations (NDOT)


Control Stations*
(Rack Mounted)


Symphony Console


Redundant
Routers

NSRS Demarcation Point

	New	Existing
FAST Center	2	11
Elko	0	2
Elko Radio Shop	1	0
Reno	0	2
Reno Radio Shop	1	0
NHP Carson EOC	0	5
Washington Yard	1	0
Carson City Hot Springs	1	0
LCB	1	0
Tonopah Radio Shop	1	0
Winnemucca Radio Shop	1	0

NSRS Provided
Backhaul

Multiple Dispatch Locations (WC)


Control Stations*
(Rack Mounted)


Symphony Console


Redundant
Routers

NSRS Demarcation Point

	New	Existing
Washoe/Reno	1	15
Sparks	0	6
WC Detention	2	0
WC Court Complex	1	0
WCSD	6	1
Reno Airport	0	4
WCRCS	1	1

NSRS Provided
Backhaul

Harris VIDA Network

NSRS Provided
Backhaul

NSRS Demarcation Point

Multiple Dispatch Locations (NVE)


Redundant
Routers


Symphony Console


Control Stations*
(Rack Mounted)

	New	Existing
Beltway	4	9
Ryan Center	2	0
Ohm	0	0
General Office Building (GOB)	0	6

Legend

NDOT
NV Energy
Washoe County

***Control Stations with Control Station Combiners**

HARRIS — Communication Systems Division, Public Safety & Professional Communications	CRM# 16CS02712
PRELIMINARY ENGINEERING SKETCH COMPANY CONFIDENTIAL	CONSOLES
PREPARED BY: A. OGDEN	
DATE: 7/25/2018	Nevada Shared Radio System
SKETCH #: 16CS02712	SHEET # 21 OF 21

Responsibility Matrix

Detailed Design Review (DDR) Responsibility Matrix

The Harris Team uses the information obtained during the Kick-Off Meeting, Preliminary Design Review, site surveys, and regulatory and engineering documentation to deliver the final system design at the DDR. This will be updated per regional cutover.

The Harris Team presents design drawings and documentation during the DDR with Washoe County.

Figure 1. Detailed Design Review Responsibility Matrix

Tasks	Harris	WASHOE COUNTY
Prepare for Detailed Design Review		
Assemble project team and travel to the WASHOE COUNTY location	X	
Assemble WASHOE COUNTY team for Kick-Off Meeting		X
Provide location in appropriate conference room or training facility		X
Present preliminary information on sites and design	X	
Provide available information and status on sites, leases, etc.		X
Provide a team and propose a schedule for site surveys	X	
Arrange access to sites and confirm site survey schedule		X
Provide site-knowledgeable personnel (customer and site owner reps, as appropriate) to accompany the project team on site surveys		X
Conduct site surveys	X	
Provide available site plans and applicable electrical and layout plans for existing sites		X
Provide available up-to-date tower and foundation drawings along with a current mapping of installed antennas and cabling		X
Perform grounding analyses	X	
Perform tower structural analyses	X	

Tasks	Harris	WASHOE COUNTY
Develop required system drawings	X	
Develop network plans and IP backhaul requirements	X	
Develop tower antenna placement plans	X	
Develop frequency plans	X	
Develop coverage maps	X	
Develop site electrical loads	X	
Develop preliminary cutover plan	X	
Develop formal project schedule	X	
Prepare Functional Acceptance Test Plan (FATP) documents	X	
Prepare one set of FCC License applications for WASHOE COUNTY's submission	X	
Submit FCC license applications and pay requisite fees		X
Arrange for site lease for any non-customer-owned sites		X
Detailed Design Review Deliverables		
System block diagrams	X	
List of deliverable equipment for each site	X	
Network connection plan and backhaul requirements	X	
Tower antenna placement drawings	X	
Antenna system drawings	X	
Coverage prediction maps	X	
Frequency plans	X	
Combiner plans	X	
Greenfield site plot drawings (after site surveys have been performed)	X	
Shelter floor plan drawings	X	
Rack elevation drawings	X	
AC power and BTU requirements	X	
Preliminary Cutover Plan	X	
Functional Acceptance Test Plan (FATP)	X	
Project schedule	X	

Tasks	Harris	WASHOE COUNTY
FCC licensed frequencies that meet contour limits and fulfill the frequency plan, in accordance with the Project Schedule	X	
Final staging acceptance test plan (SATP)	X	
Final coverage acceptance test plan (CATP)	X	
Fleet map plan	X	
Training plan	X	
Detailed Design Review		
Provide deliverables for review 10 business days prior to review	X	
Review documents		X
Provide location for DDR meeting		X
Approve the design following DDR meeting (20 business days)		X

Manufacturing and Staging Responsibility Matrix

The responsibility matrix shown in Figure 2 provides the staging activities that the Harris Team is responsible for and those activities that are the responsibility of WASHOE COUNTY. Each region of the State system repeats the manufacturing, staging, and factory acceptance test (FAT) processes to meet the dates on the project schedule.

Figure 2. System Integration and Test - Staging Responsibility Matrix

Tasks	Harris	WASHOE COUNTY
Insert equipment delivery dates into the material planning system per region	X	
Place orders with the factory per region	X	
Place orders with key suppliers per region	X	
Manufacture all infrastructure equipment per region	X	
Assemble equipment in staging area on a per site basis	X	
Provide appropriate personnel to participate in/witness each region's FAT		X
Run a FAT in each region	X	

Tasks	Harris	WASHOE COUNTY
Provide approval for each FAT and authorize the region to be shipped (within 5 business days)		X

Shipping, Warehousing, and Inventory Responsibility Matrix

Figure 3 shows the shipping and inventory activities that the Harris Team is responsible for and those activities that the Team believes are the responsibilities of WASHOE COUNTY that will be repeated for each region.

Figure 3. Shipping & Inventory Responsibility Matrix

Tasks	Harris	WASHOE COUNTY
Break down equipment and ship to storage area	X	
Provide temporary storage in the state of Nevada	X	
Inventory equipment	X	
Validate Harris equipment inventory		X
Sort equipment in preparation for site delivery and installation	X	

System Installation Responsibility Matrix

Figure 4 provides a system installation responsibility matrix for antenna systems and infrastructure equipment, that is repeated for each region.

Figure 4. System Infrastructure Installation Responsibility Matrix

Tasks	Harris	WASHOE COUNTY
Deliver equipment to each site	X	
Install equipment, connect to ground system and apply power	X	
Connect all RF cables	X	
Interface to network, verify network connectivity	X	
Set all P25 system levels and parameters	X	
Connect all P25 system alarms	X	

System Optimization Responsibility Matrix

Harris will conduct a preliminary Acceptance Test to determine that the systems are fully optimized and ready for the Acceptance Test with WASHOE COUNTY. Figure 5 describes those tasks to be performed in System Optimization for each Region.

Figure 5. System Optimization Matrix

Tasks	Harris	WASHOE COUNTY
Prepare all installed sites for site inspections	X	
Verify microwave/backhaul system is functional and meets reliability specifications	X	
Provide frequencies to use for optimization and testing (if frequencies are currently in use in existing system)		X
Verify P25 levels and parameters are set	X	
Verify P25 alarm and system monitoring system are operational	X	
Verify system database is installed and operating correctly	X	
Verify proper dispatch operation	X	
Verify proper P25 functional operation	X	
Verify proper network switching operation	X	
Verify proper mutual aid operation	X	
Coordinate testing of the desired interoperability channels		X
Verify proper interoperability from gateways	X	

Final Acceptance Testing Responsibility Matrix

Figure 6 provides a detailed listing of those Final Acceptance Testing activities performed by Harris, and those activities that WASHOE COUNTY will perform for each region.

Figure 6. Acceptance Testing Responsibility Matrix

Tasks	Harris	WASHOE COUNTY
Provide appropriate team members to participate in acceptance tests	X	X
Inspect each RF site, noting discrepancies on the punch list	X	
Inspect each dispatch center, noting discrepancies on the punch list	X	
Inspect each network center, noting discrepancies on the punch list	X	
Submit site inspection results	X	
Approve site inspection results within 15 business days		X
Perform functional ATP on radio system, dispatch consoles, network monitoring, and user radios	X	
Submit functional ATP results	X	
Approve functional ATP results (within 15 business days)		X
Provide team members to participate in coverage tests		X
Provide test vehicles and drivers for acceptance testing	X	
Provide test radios for automatic coverage tests	X	
Perform automated coverage test of P25 per system contract	X	
Provide test radios for voice quality test	X	
Perform voice quality test of P25 per system contract	X	X
Submit coverage ATP results	X	
Approve coverage ATP results		X
Cut users over to the new P25 system	X	X
Decommission legacy system	X	

User Radio Equipment Responsibility Matrix

All mobile radio installations will be closely coordinated with WASHOE COUNTY and participating user agencies, to minimize disruption to their operation, and to reduce out-of-service and unproductive time. Figure 7 describes the activities in User Radio Equipment Implementation performed by Harris, and those activities that WASHOE COUNTY will perform for each region.

Figure 7. User Radio Equipment Responsibility Matrix

Tasks	Harris	WASHOE COUNTY
Program and distribute Harris portable units with accessories	X	
Provide central facilities for regional mobile vehicle installation		X
Provide vehicles to meet the project schedule timeline		X
Program and install Harris mobile units and remove existing radios	X	
Provide pre- and post- installation vehicle assessments, presenting installation documentation for customer acceptance for each vehicle	X	
Provide a temporary storage facility for equipment that Harris removes from the vehicles	X	
Provide a representative to review installation documentation and provide acceptance for each vehicle		X

General and Site Development Responsibility Matrices

The general responsibility matrix describes the general project responsibilities of both parties that are not associated with any specific site.

Figures 8 thru 11 represent the general and site development responsibilities if Washoe County chooses to issue Harris a change order to perform the site development and site civil requirements.

Figure 8. General Responsibility Matrix

Tasks	Harris	WASHOE COUNTY
Coordinate with federal, state, and local government agencies, as required		X
Provide access to all buildings and sites, including temporary ID badges for Harris project team		X
Provide parking permits for Harris project team for any restricted parking areas		X
Provide adequate road access for delivery vehicles		X
Arrange for temporary parking to off-load equipment at all buildings and sites		X
Clean up site and remove all installation debris	X	
Remove any hazardous material found on site		X
Ensure that no utility transformers additions or upgrades will be required to provide the adequate AC power needed for each site		X
Develop sites and install civil materials in accordance with industry and Harris standards, pending Washoe County approval	X	
Provide final backhaul requirements to the WASHOE COUNTY	X	
Provide backhaul which meets the final backhaul requirements provided by Harris	X	

The site responsibility matrices below define the responsibilities of both parties for the implementation of the P25 Project.

Figure 9. Existing Customer-Owned Sites Responsibility Matrix

Tasks	Harris	WASHOE COUNTY
Customer-Owned Site Tasks		
Obtain any necessary zoning approval for site changes		X
Perform physical path surveys for each microwave path	X	
Provide existing site plans		X
Perform grounding analysis	X	
Provide WASHOE COUNTY site survey results report and recommendations	X	
Existing Tower		
Provide current tower and foundation drawings along with a current mapping of installed antennas and cabling		X
Identify specific tower attachment points to mount new antennas per the system design	X	
Confirm availability of tower attachment points for Harris antennas		X
Perform tower analysis on existing tower and provide results at DDR. If tower fails load analysis, Harris can provide quotes to strengthen tower (if possible), replace the tower, or provide site acquisition services.	X	
Strengthen or replace tower (if required by structural analysis results, Harris will replace tower if requested through the change order process)		X
Provide space on existing tower to mount new system antennas at Harris specified locations		X
Ensure adequate space is available on cable ice bridge, and		X

Tasks	Harris	WASHOE COUNTY
tower cable ladders, to support new cable runs		
Install new antenna(s) using appropriate 6 ft. side arms and mounting hardware	X	
Install antenna coax, connectors and jumpers, using cable clamps to properly secure cable to tower, and add grounding kits at the top, bottom, and on ice bridge	X	
If required by the system design, Harris will install a new tower top amplifier	X	
Install antenna lightning protection devices on each transmission line LMR run after it enters shelter via cable entry port; ground device to main ground bus bar	X	
If required, install new microwave dish(es) on pipe mounts with anti-sway kits	X	
Install new microwave waveguide or coaxial feed lines, secure to cable ladder(s), and add grounding kits at the top, bottom, and on ice bridge	X	
Tag and identify each new antenna line	X	
Sweep test each new antenna line in accordance with Harris' "Transmission Line Analysis (Antenna Sweep) Procedure, and maintain copies in site logbook	X	
Existing Shelter		
Provide floor space in existing RF shelter for new equipment racks used in the new design		X
Provide adequate shelter/equipment room utility AC electrical power, single-point ground system HVAC, and backup generator power	X	
If existing entrance ports are not available WASHOE COUNTY	X	

Tasks	Harris	WASHOE COUNTY
will provide Harris with a change order to provide new cable entry ports		
Upgrade existing interior ground system (requires change order)	X	
Provide additional cable ladder for new equipment row	X	
If needed, Harris will prepare and submit electrical permits on behalf of the customer	X	
Install new DC power plant and wire to racks if required (requires change order)	X	
Provide floor space at the dispatch center and network center for new system equipment		X
Provide backup power (UPS) for NSC		X
Provide backup power (UPS) for consoles		X
Provide demarcation blocks for connection to existing legacy radios to be used in interoperability system		X

Figure 10. Greenfield Site Responsibility Matrix

Tasks	Harris	WASHOE COUNTY
Obtain land through lease or purchase for use in the new radio project		X
Perform physical path surveys for each new microwave path	X	
Provide WASHOE COUNTY site survey results report and recommendations	X	
Stake out the desired location for tower, shelter, generator, and compound	X	

Tasks	Harris	WASHOE COUNTY
After a change order has been issued and assurances have been made that this site can be developed, Harris will have an architectural firm develop site plot drawings of compound showing new tower, shelter, generator, and fuel tank locations	X	
Obtain all required zoning approvals to construct the site		X
Prepare FAA/FCC applications for new tower	X	
Submit FAA/FCC forms for new tower		X
Prepare new tower NEPA/SHPO environmental studies and THPO filings	X	
Arrange and pay for electric power/service at each site getting a new shelter or improved electrical service. Terminate AC power within 50 ft. of new shelter. Provide utility transformers, if necessary, to provide the required AC power.		X
Prepare and submit construction permits for new tower or shelter (requires change order)	X	
Prepare and submit electrical permits	X	
If required, create an access road that will be 10 ft. wide. (pricing for access road will be determined after site surveys are complete)	X	
Schedule soil boring test for tower leg foundations in accordance with TIA-222 standards for new towers, and review results with (WASHOE COUNTY)	X	
If soil boring test results indicate a foundation design is required to address other than typical soil conditions. Harris will submit a site-specific foundation design, and pricing change request	X	
Level land, construct silt fences, and remove weeds and brush	X	

Tasks	Harris	WASHOE COUNTY
Construct tower foundation	X	
Erect new tower (type and height to be determined after site surveys)	X	
Construct full-slab shelter foundation	X	
Transport, off-load and set new shelter (shelter type and generator size will be determined after site surveys)	X	
Trench in 200A single-phase 240V AC electrical service to new shelter	X	
Provide new cable entry ports	X	
Construct generator foundation (if required)	X	
Transport, off-load, and set new generator on pad	X	
Trench in generator electrical service and control circuits to shelter-mounted ATS	X	
Construct generator LP-fuel tank pad (if required)	X	
Transport, off-load, and set new LP-fuel tank on pad	X	
Trench in fuel lines between tank and generator	X	
Fill generator fuel tank (first fill)	X	
Provide factory generator technician to provide first start service	X	
Install new perimeter fence with gate (if required)	X	
Construct exterior ground system for tower, shelter, generator, fuel tank, and fence corner posts	X	
Spread new compound gravel/crushed stone	X	
Construct new cable ice bridge for sites with new towers and/or shelters	X	

Tasks	Harris	WASHOE COUNTY
Supply copper ground plate for mounting on tower to ground all coaxial cables as they leave the tower on the cable ice bridge	X	
Install new LMR antenna(s), using appropriate 6 ft. side arms and mounting hardware	X	
Install LMR antenna coax, connectors, and jumpers, using cable clamps to properly secure cable to tower and add grounding kits at the top, bottom, and on ice bridge.	X	
Install new tower top amplifier	X	
Install antenna lightning protection devices on each LMR run after it enters shelter via cable entry port; ground device to main ground bus bar	X	
Install new microwave dish(es) on pipe mounts with anti-sway kits	X	
Install new microwave waveguide or coaxial feed lines, secure to cable ladder(s), and add grounding kits at the top, bottom, and on ice bridge	X	
Tag and identify each new antenna line	X	
Sweep test each new antenna line in accordance with Harris' "Transmission Line Analysis (Antenna Sweep) Procedure, and maintain copies in site logbook	X	
Install new DC power plant and wire to racks	X	

Figure 11. Existing Collocation Sites Responsibility Matrix

Tasks	Harris	WASHOE COUNTY
Collocated Site Tasks		
Arrange for access to third party collocated site		X
Negotiate and obtain lease (or modify existing lease) for third party co-location site, ensuring the site lease includes required space on the tower, cable ice bridge, and tower cable ladders to support new cable runs, space-in compound for new shelter, generator, and fuel tank		X
Ensure co-location agreements address site compound space requirements to include confirmation that no subsurface obstructions preclude running conduits for power or leased circuits, as well as running lines between shelters, generators, and fuel tanks		X
Arrange with third party site owner to perform tower analysis	X	
Perform physical path surveys for each microwave path	X	
Provide available existing site plans		X
Perform grounding analysis	X	
Provide site survey and grounding results report and recommendations	X	
Existing Tower		
Provide current tower and foundation drawings, from site owner, along with a current mapping of installed antennas and cabling		X
Identify specific tower attachment points to mount new antennas per the system design	X	

Tasks	Harris	WASHOE COUNTY
Confirm availability of tower attachment points for Harris antennas	X	
Perform tower analysis on existing tower and provide results at DDR. If tower fails load analysis, Harris can provide quotes to strengthen tower (if possible), replace the tower, or provide site acquisition services.	X	
Strengthen or replace tower (if required by structural analysis results, Harris will replace if requested by change order)	X	
Provide space on existing tower to mount new system antennas at Harris specified locations (defined in site lease)		X
Ensure adequate space is available on cable ice bridge, and tower cable ladders, to support new cable runs		X
Install new antenna(s) using appropriate 6 ft. side arms and mounting hardware	X	
Install antenna coax, connectors and jumpers, using cable clamps to properly secure cable to tower, and add grounding kits at the top, bottom, and on ice bridge	X	
If required by the system design, Harris will install a new tower top amplifier	X	
Install antenna lightning protection devices on each transmission line LMR run after it enters shelter via cable entry port; ground device to main ground bus bar	X	
If required, install new microwave dish(es) on pipe mounts with anti-sway kits	X	
Install new microwave waveguide or coaxial feed lines, secure to cable ladder(s), and add grounding kits at the top, bottom, and on ice bridge	X	

Tasks	Harris	WASHOE COUNTY
Tag and identify each new antenna line	X	
Sweep test each new antenna line in accordance with Harris' "Transmission Line Analysis (Antenna Sweep) Procedure, and maintain copies in site logbook	X	
New Shelter		
Stake out the desired location for new shelter	X	
Have an architectural firm develop site compound plot drawings of compound showing tower, new shelter, generator, and fuel tank locations	X	
Obtain any required zoning approvals		X
Prepare and submit construction permits for new shelter	X	
Arrange for and pay for electric power/service at each site getting a new shelter or improved electrical service. Terminate AC power within 50 ft. of new shelter. Provide utility transformers, if necessary, to provide the required AC power.		X
Harris Prepare and Washoe submit electrical permits	X	X
Level land, construct silt fences, and remove weeds and brush	X	
Construct full-slab shelter foundation	X	
Transport, off-load, and set new shelter	X	
Trench in 200A single phase 240 V AC electrical service to new shelter	X	
Construct exterior ground system for new shelter and tie into existing tower, generator, fuel tank, and fence corner posts ground	X	
Install new DC power plant and wire to racks	X	

Tasks	Harris	WASHOE COUNTY
New Generator		
Stake out the desired location for new generator and diesel tank pad	X	
Have an architectural firm develop site compound plot drawings of compound showing tower, shelter, new generator, and Diesel tank locations	X	
Obtain all required zoning permits and approvals		X
Prepare and submit construction permits for new generator	X	
Arrange and pay for electric power/service at each site getting a new shelter or improved electrical service. Terminate AC power within 50 ft. of new shelter. Provide utility transformers, if necessary, to provide the required AC power.		X
Prepare and submit electrical permits	X	
Level land, construct silt fences, and remove weeds and brush	X	
Construct/pour generator & fuel tank pads (if required)	X	
Transport, off-load, and set new generator on pad	X	
Trench in generator electrical service and control circuits to shelter-mounted ATS	X	
Transport, off-load, and set new Diesel-fuel tank on pad	X	
Trench in fuel lines between tank and generator	X	
Ground generator and fuel tank to tower/shelter ground system	X	
Fill generator fuel tank (first fill)	X	
Provide factory generator technician for first-start service	X	
Expand Compound		
Have an architectural firm develop site compound plot drawings	X	

Tasks	Harris	WASHOE COUNTY
of compound showing tower, shelter, generator, and Diesel tank locations		
Level land, construct silt fences, and remove weeds and brush	x	
Install new. perimeter fence with gate	X	
Expand existing compound	X	
Expand existing compound fence line	X	
Tie fence corner posts back to tower/shelter exterior ground system	X	
Spread new compound gravel/crushed stone	X	

Figures 12 thru 15 represent the general and site development responsibilities if Washoe County chooses to self-perform the site development and site civil requirements.

Figure 12. General Responsibility Matrix

Tasks	Harris	WASHOE COUNTY
Coordinate with federal, state, and local government agencies, as required		X
Provide access to all buildings and sites, including temporary ID badges for Harris project team		X
Provide parking permits for Harris project team for any restricted parking areas		X
Provide adequate road access for delivery vehicles		X
Arrange for temporary parking to off-load equipment at all buildings and sites		X
Clean up site and remove all installation debris	X	

Remove any hazardous material found on site		X
Ensure that no utility transformers additions or upgrades will be required to provide the adequate AC power needed for each site		X
Develop sites and install civil materials in accordance with industry and Harris standards		X
Provide final backhaul requirements to the WASHOE COUNTY	X	
Provide backhaul which meets the final backhaul requirements provided by Harris	X	

The site responsibility matrices below define the responsibilities of both parties for the implementation of the P25 Project.

Figure 13. Existing Customer-Owned Sites Responsibility Matrix

Tasks	Harris	WASHOE COUNTY
Customer-Owned Site Tasks		
Obtain any necessary zoning approval for site changes		X
Perform physical path surveys for each microwave path	X	
Provide existing site plans		X
Perform grounding analysis	X	
Provide WASHOE COUNTY site survey results report and recommendations	X	
Existing Tower		
Provide available current tower and foundation drawings along with a current mapping of installed antennas and cabling		X
Identify specific tower attachment points to mount new antennas	X	

Tasks	Harris	WASHOE COUNTY
per the system design		
Confirm availability of tower attachment points for Harris antennas		X
Perform tower analysis on existing tower and provide results at DDR. If tower fails load analysis, Harris can provide quotes to strengthen tower (if possible), replace the tower, or provide site acquisition services.	X	
Strengthen or replace tower (if required by structural analysis results, Harris will replace tower if requested through the change order process)		X
Provide space on existing tower to mount new system antennas at Harris specified locations		X
Ensure adequate space is available on cable ice bridge, and tower cable ladders, to support new cable runs		X
Install new antenna(s) using appropriate 6 ft. side arms and mounting hardware	X	
Install antenna coax, connectors and jumpers, using cable clamps to properly secure cable to tower, and add grounding kits at the top, bottom, and on ice bridge	X	
If required by the system design, Harris will install a new tower top amplifier	X	
Install antenna lightning protection devices on each transmission line LMR run after it enters shelter via cable entry port; ground device to main ground bus bar	X	
If required, install new microwave dish(es) on pipe mounts with anti-sway kits	X	
Install new microwave waveguide or coaxial feed lines, secure to cable ladder(s), and add grounding kits at the top, bottom, and on	X	

Tasks	Harris	WASHOE COUNTY
ice bridge		
Tag and identify each new antenna line	X	
Sweep test each new antenna line in accordance with Harris' "Transmission Line Analysis (Antenna Sweep) Procedure, and maintain copies in site logbook	X	
Existing Shelter		
Provide floor space in existing RF shelter for new equipment racks used in the new design		X
Provide adequate shelter/equipment room utility AC electrical power, single-point ground system HVAC, and backup generator power		X
If existing entrance ports are not available WASHOE COUNTY will provide Harris with a change order to provide new cable entry ports		X
Upgrade existing interior ground system (requires change order)	X	
Provide additional cable ladder for new equipment row	X	
If needed, Harris will prepare and submit electrical permits on behalf of the customer	X	
Install new DC power plant and wire to racks if required (requires change order)	X	
Provide floor space at the dispatch center and network center for new system equipment		X
Provide backup power (UPS) for NSC		X
Provide backup power (UPS) for consoles		X
Provide demarcation blocks for connection to existing legacy radios to be used in interoperability system		X

Figure 14. Greenfield Site Responsibility Matrix

Tasks	Harris	WASHOE COUNTY
Obtain land through lease or purchase for use in the new radio project		X
Perform physical path surveys for each new microwave path	X	
Provide WASHOE COUNTY site survey results report and recommendations	X	
Stake out the desired location for tower, shelter, generator, and compound	X	
After a change order has been issued and assurances have been made that this site can be developed, Harris will have an architectural firm develop site plot drawings of compound showing new tower, shelter, generator, and fuel tank locations	X	
Obtain all required zoning approvals to construct the site		X
Prepare FAA/FCC applications for new tower		X
Submit FAA/FCC forms for new tower		X
Prepare new tower NEPA/SHPO environmental studies and THPO filings		X
Arrange and pay for electric power/service at each site getting a new shelter or improved electrical service. Terminate AC power within 50 ft. of new shelter. Provide utility transformers, if necessary, to provide the required AC power.		X
Prepare and submit construction permits for new tower or shelter (requires change order)		X
Prepare and submit electrical permits		X
If required, create an access road that will be 10 ft. wide.		X

Tasks	Harris	WASHOE COUNTY
Schedule soil boring test for tower leg foundations in accordance with TIA-222 standards for new towers, and review results with (WASHOE COUNTY)		X
If soil boring test results indicate a foundation design is required to address other than typical soil conditions. Harris will submit a site-specific foundation design, and pricing change request		X
Level land, construct silt fences, and remove weeds and brush		X
Construct tower foundation		X
Erect new tower (type and height to be determined after site surveys)		X
Construct full-slab shelter foundation		X
Transport, off-load and set new shelter (shelter type and generator size will be determined after site surveys)		X
Trench in 200A single-phase 240V AC electrical service to new shelter		X
Provide new cable entry ports		X
Construct generator foundation (if required)		X
Transport, off-load, and set new generator on pad		X
Trench in generator electrical service and control circuits to shelter-mounted ATS		X
Construct generator Diesel-fuel tank pad (if required)		X
Transport, off-load, and set new Diesel-fuel tank on pad		X
Trench in fuel lines between tank and generator		X
Fill generator fuel tank (first fill)		X
Provide factory generator technician to provide first start service		X

Tasks	Harris	WASHOE COUNTY
Install new perimeter fence with gate (if required)		X
Construct exterior ground system for tower, shelter, generator, fuel tank, and fence corner posts		X
Spread new compound gravel/crushed stone		X
Construct new cable ice bridge for sites with new towers and/or shelters		X
Supply copper ground plate for mounting on tower to ground all coaxial cables as they leave the tower on the cable ice bridge	X	
Install new LMR antenna(s), using appropriate 6 ft. side arms and mounting hardware	X	
Install LMR antenna coax, connectors, and jumpers, using cable clamps to properly secure cable to tower and add grounding kits at the top, bottom, and on ice bridge.	X	
Install new tower top amplifier	X	
Install antenna lightning protection devices on each LMR run after it enters shelter via cable entry port; ground device to main ground bus bar	X	
Install new microwave dish(es) on pipe mounts with anti-sway kits	X	
Install new microwave waveguide or coaxial feed lines, secure to cable ladder(s), and add grounding kits at the top, bottom, and on ice bridge	X	
Tag and identify each new antenna line	X	
Sweep test each new antenna line in accordance with Harris' "Transmission Line Analysis (Antenna Sweep) Procedure, and maintain copies in site logbook	X	
Install new DC power plant and wire to racks		X

Figure 15. Existing Collocation Sites Responsibility Matrix

Tasks	Harris	WASHOE COUNTY
Collocated Site Tasks		
Arrange for access to third party collocated site		X
Negotiate and obtain lease (or modify existing lease) for third party co-location site, ensuring the site lease includes required space on the tower, cable ice bridge, and tower cable ladders to support new cable runs, space-in compound for new shelter, generator, and fuel tank		X
Ensure co-location agreements address site compound space requirements to include confirmation that no subsurface obstructions preclude running conduits for power or leased circuits, as well as running lines between (Informal WASHOE COUNTY)'s shelters, generators, and fuel tanks		X
Arrange with third party site owner to perform tower analysis	X	
Perform physical path surveys for each microwave path	X	
Provide existing site plans		X
Perform grounding analysis	X	
Provide site survey and grounding results report and recommendations	X	
Existing Tower		
Provide current tower and foundation drawings, from site owner, along with a current mapping of installed antennas and cabling		X
Identify specific tower attachment points to mount new antennas per the system design	X	

Tasks	Harris	WASHOE COUNTY
Confirm availability of tower attachment points for Harris antennas		X
Perform tower analysis on existing tower and provide results at DDR. If tower fails load analysis, Harris can provide quotes to strengthen tower (if possible), replace the tower, or provide site acquisition services.	X	
Strengthen or replace tower (if required by structural analysis results, Harris will replace if requested by change order)		X
Provide space on existing tower to mount new system antennas at Harris specified locations (defined in site lease)		X
Ensure adequate space is available on cable ice bridge, and tower cable ladders, to support new cable runs		X
Install new antenna(s) using appropriate 6 ft. side arms and mounting hardware	X	
Install antenna coax, connectors and jumpers, using cable clamps to properly secure cable to tower, and add grounding kits at the top, bottom, and on ice bridge	X	
If required by the system design, Harris will install a new tower top amplifier	X	
Install antenna lightning protection devices on each transmission line LMR run after it enters shelter via cable entry port; ground device to main ground bus bar	X	
If required, install new microwave dish(es) on pipe mounts with anti-sway kits	X	
Install new microwave waveguide or coaxial feed lines, secure to cable ladder(s), and add grounding kits at the top, bottom, and on ice bridge	X	

Tasks	Harris	WASHOE COUNTY
Tag and identify each new antenna line	X	
Sweep test each new antenna line in accordance with Harris' "Transmission Line Analysis (Antenna Sweep) Procedure, and maintain copies in site logbook	X	
New Shelter		
Stake out the desired location for new shelter		X
Have an architectural firm develop site compound plot drawings of compound showing tower, new shelter, generator, and fuel tank locations		X
Obtain any required zoning approvals		X
Prepare and submit construction permits for new shelter		X
Arrange for and pay for electric power/service at each site getting a new shelter or improved electrical service. Terminate AC power within 50 ft. of new shelter. Provide utility transformers, if necessary, to provide the required AC power.		X
Harris Prepare and Washoe submit electrical permits	X	X
Level land, construct silt fences, and remove weeds and brush		X
Construct full-slab shelter foundation		X
Transport, off-load, and set new shelter		X
Trench in 200A single phase 240 V AC electrical service to new shelter		X
Construct exterior ground system for new shelter and tie into existing tower, generator, fuel tank, and fence corner posts ground		X
Install new DC power plant and wire to racks		X

Tasks	Harris	WASHOE COUNTY
New Generator		
Stake out the desired location for new generator and diesel tank pad		X
Have an architectural firm develop site compound plot drawings of compound showing tower, shelter, new generator, and Diesel tank locations		X
Obtain all required zoning permits and approvals		
Prepare and submit construction permits for new generator		X
Arrange and pay for electric power/service at each site getting a new shelter or improved electrical service. Terminate AC power within 50 ft. of new shelter. Provide utility transformers, if necessary, to provide the required AC power.		X
Prepare and submit electrical permits		X
Level land, construct silt fences, and remove weeds and brush		X
Construct/pour generator & fuel tank pads (if required)		X
Transport, off-load, and set new generator on pad		X
Trench in generator electrical service and control circuits to shelter-mounted ATS		X
Transport, off-load, and set new Diesel-fuel tank on pad		X
Trench in fuel lines between tank and generator		X
Ground generator and fuel tank to tower/shelter ground system		X
Fill generator fuel tank (first fill)		X
Provide factory generator technician for first-start service		X
Expand Compound		

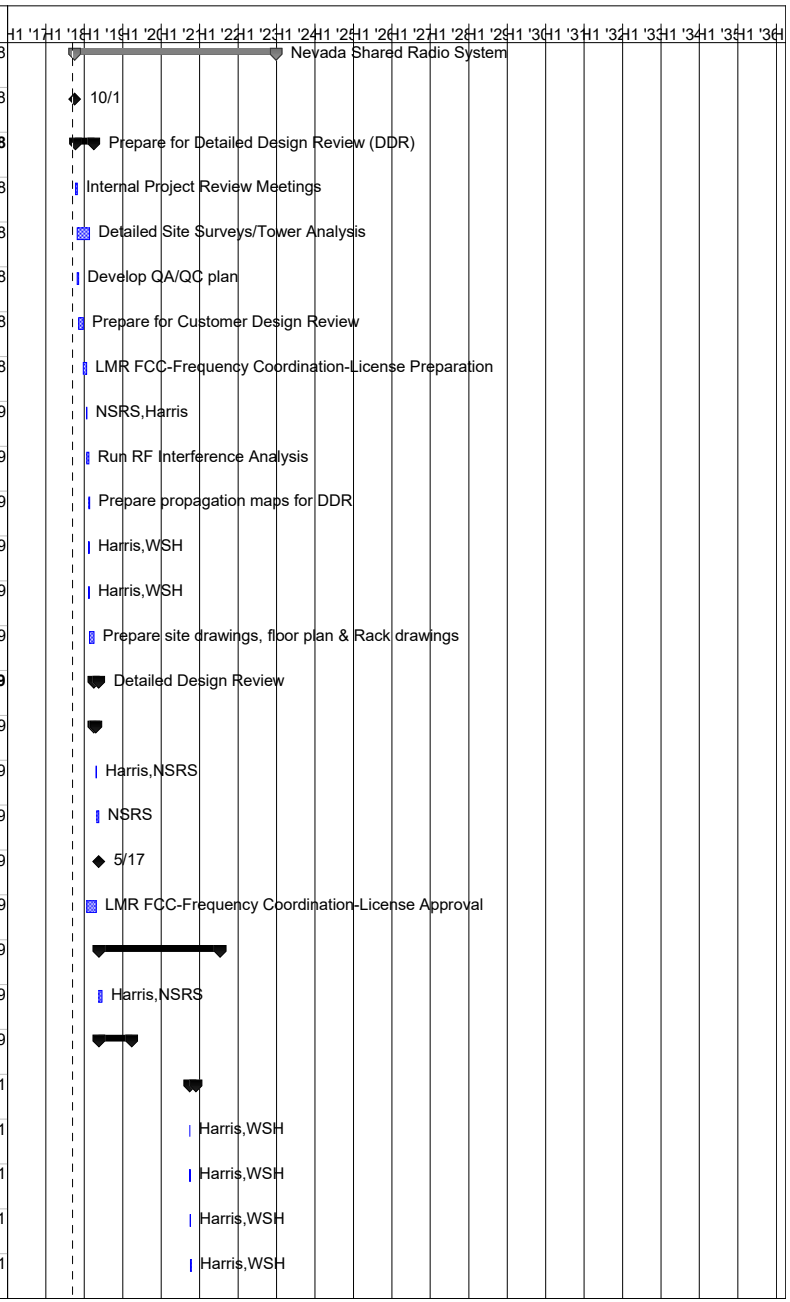
Tasks	Harris	WASHOE COUNTY
Have an architectural firm develop site compound plot drawings of compound showing tower, shelter, generator, and LP tank locations		X
Level land, construct silt fences, and remove weeds and brush		X
Install new. perimeter fence with gate		X
Expand existing compound		X
Expand existing compound fence line		X
Tie fence corner posts back to tower/shelter exterior ground system		X
Spread new compound gravel/crushed stone		X

NOTE: All site development activities are optional and site development requirements for all locations will be determined after site surveys are performed. Once site development requirements are identified WASHOE COUNTY will have the option to submit a change order to Harris to perform the site development activities. Harris specifically excludes solar sites from the optional pricing that has been submitted.

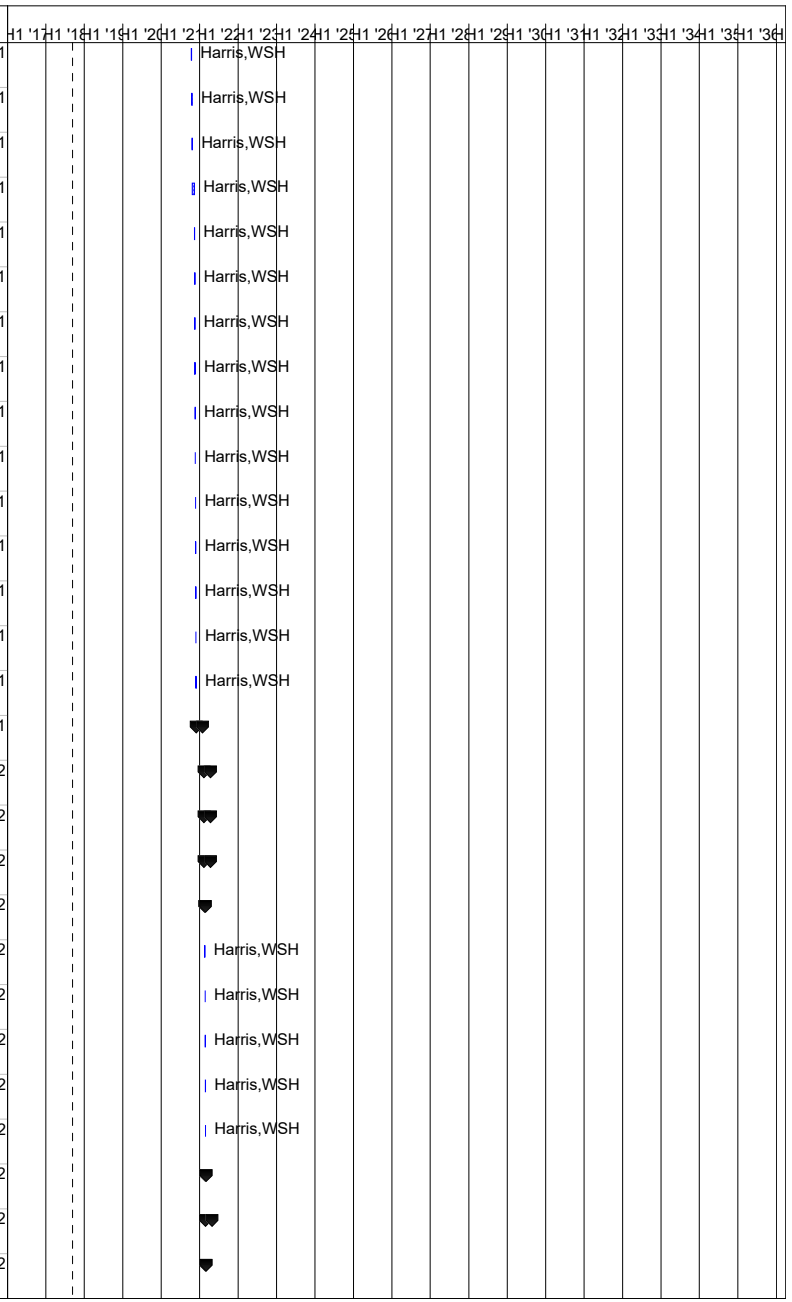
During site surveys it will be determined if any sites require non-standard vehicle access (i.e. helicopter) and will be priced accordingly through the change order process. Project schedule needs to align with typical seasonal weather for 4-wheel drive access to all sites.

Blue = NDOT RF Site
Green = Washoe Co RF Site
Grey =NVE RF Site

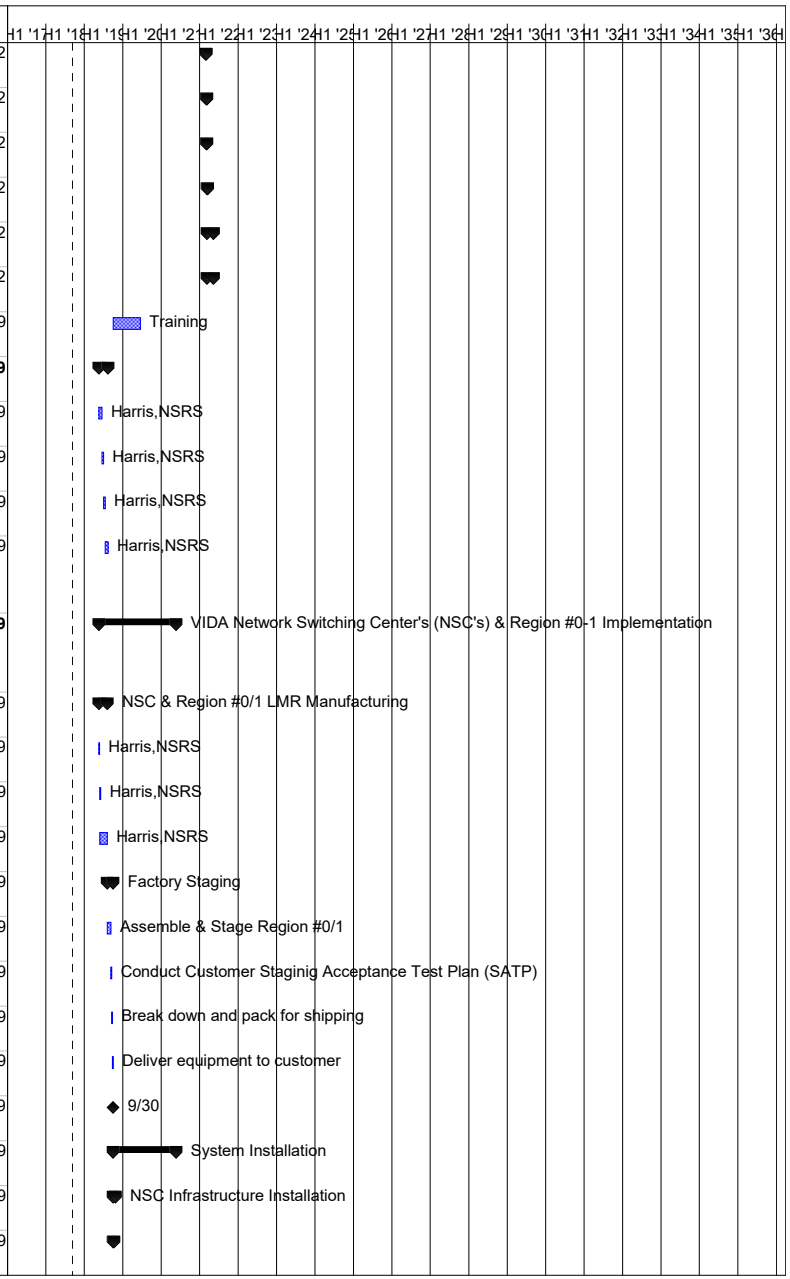
ID	Resource Names	Region	Name	Duration	Start
0			**Nevada Shared Radio System**	1337 days	Mon 10/1/18
2	Harris,NSF		Contract Signed - Billing Milestone	0 days	Mon 10/1/18
3	**Harris,NS**		**Prepare for Detailed Design Review (DDR)**	**115 days**	**Wed 10/10/18**
4	Harris,NSF	All	Internal Project Review Meetings	10 days	Wed 10/10/18
5	Harris,NSF	All	Detailed Site Surveys/Tower Analysis	75 days	Wed 10/24/18
6	Harris,NSF	All	Develop QA/QC plan	10 days	Wed 10/24/18
7	Harris,NSF	All	Prepare for Customer Design Review	30 days	Wed 11/7/18
8	Harris,NSF	All	LMR FCC-Frequency Coordination-License Preparation	15 days	Fri 12/21/18
9	NSRS,Har	All	LMR FCC-Frequency Coordination-License Submission	1 day	Tue 1/22/19
10	Harris,NSF	All	Run RF Interference Analysis	15 days	Wed 1/23/19
11	Harris,NSF	All	Prepare propagation maps for DDR	5 days	Wed 2/13/19
12	Harris,WS		Order Microwave Path Survey and Design	1 day	Wed 2/13/19
13	Harris,WS		Hire Site Manager (SM) (General Contractor)	1 day	Wed 2/13/19
14	Harris,NSF	All	Prepare site drawings, floor plan & Rack drawings	30 days	Tue 2/19/19
15	**Harris,NS**	**All**	**Detailed Design Review**	**34 days**	**Tue 4/2/19**
16	Harris,NSF		Detailed Design Review Meeting	14 days	Tue 4/2/19
18	Harris,NSF		Verify Customer Backhaul Design Documentation	3 days	Mon 4/22/19
19	NSRS		Detailed Design Review Approval	15 days	Mon 4/29/19
20	Harris,NSF		CDR Approved by Customer - Billing Milestone	0 days	Fri 5/17/19
21	NSRS,Har	All	LMR FCC-Frequency Coordination-License Approval	90 edays	Tue 1/22/19
22			**Site Civil Construction**	801 days	Mon 5/20/19
23	Harris,NSF		Develop site plots for all sites	4 wks	Mon 5/20/19
24	Harris,NSF		Plans, Permits, and Approvals	212 days	Mon 5/20/19
806	Harris,WS		W/Snowflake P25 RF Site	44 days	Tue 9/28/21
807	Harris,WS		Mobilization / Layout	1 day	Tue 9/28/21
808	Harris,WS		Clean Access / Compound Area	2 days	Wed 9/29/21
809	Harris,WS		Grade Access / Compound	2 days	Fri 10/1/21
810	Harris,WS		Install Tower Foundation	5 days	Tue 10/5/21



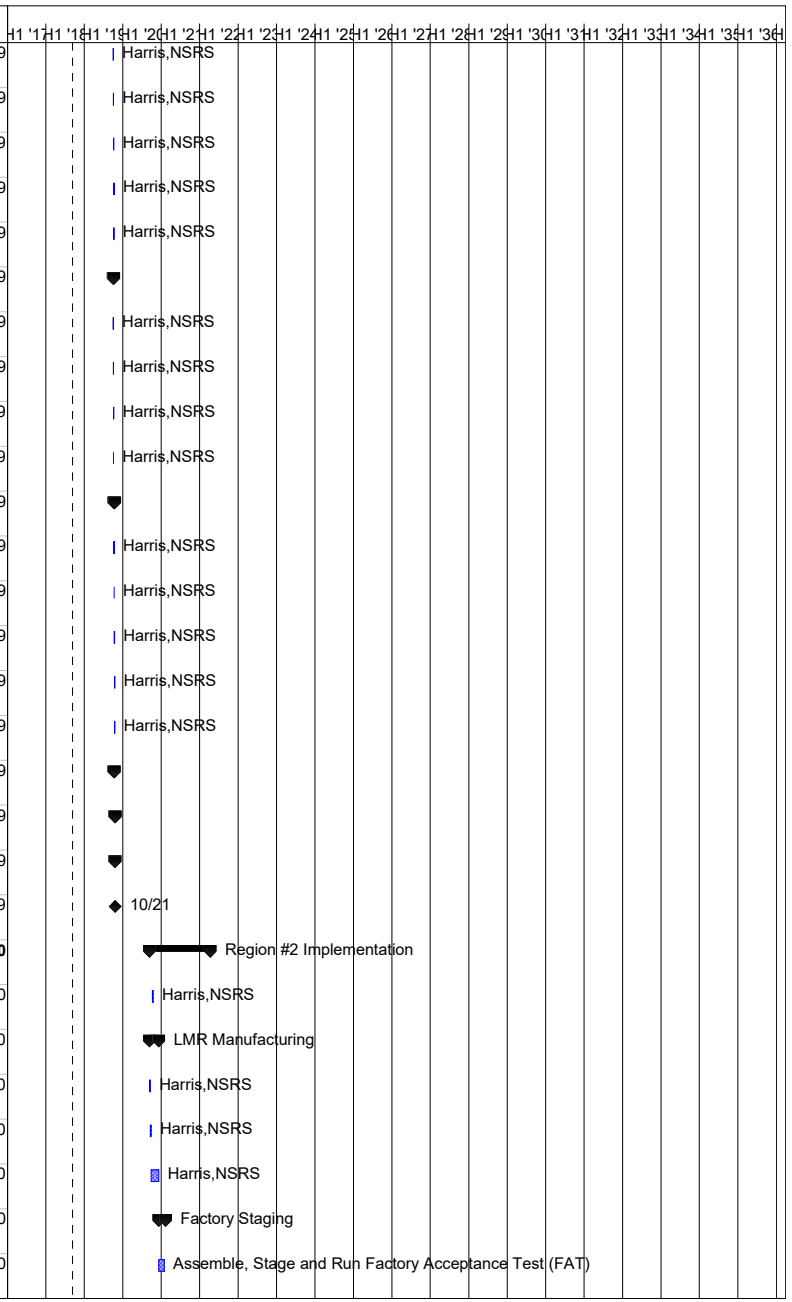
ID	Resource Names	Region	Name	Duration	Start
811	Harris,WSH		Install Shelter Foundations	3 days	Tue 10/12/21
812	Harris,WSH		Install Underground Grounding	3 days	Fri 10/15/21
813	Harris,WSH		Install Underground Utility Conduits	2 days	Wed 10/20/21
814	Harris,WSH		Stack Tower	15 days	Fri 10/22/21
815	Harris,WSH		Set Shelter	1 day	Fri 11/12/21
816	Harris,WSH		Install Ice Bridge	1 day	Mon 11/15/21
817	Harris,WSH		Complete Above Grade Utility Connections	1 day	Tue 11/16/21
818	Harris,WSH		Install Weed Barrier and Stone Compound	1 day	Wed 11/17/21
819	Harris,WSH		Install Fence	1 day	Thu 11/18/21
820	Harris,WSH		Complete Above Grade Grounding	1 day	Fri 11/19/21
821	Harris,WSH		Install Lines and Antennas	1 day	Mon 11/22/21
822	Harris,WSH		Perform ATP with Vendors	1 day	Tue 11/23/21
823	Harris,WSH		Provide re-line drawing to colocation owner	1 day	Wed 11/24/21
824	Harris,WSH		Punchlist items identified and resolved	1 day	Thu 11/25/21
825	Harris,WSH		Site Accepted by Harris and Customer	1 day	Fri 11/26/21
832	Harris,WSH		W/Biltmore P25 RF Site	44 days	Mon 11/29/21
926	Harris,WSH		W/Slide P25 RF Site	44 days	Fri 2/11/22
946	Harris,WSH		W/Smokey Quarts P25 RF Site	44 days	Fri 2/11/22
966	Harris,WSH		W/Tahoe SC P25 RF Site	44 days	Fri 2/11/22
1038	Harris,WSH		W/Chimney Peak P25 RF Site	5 days	Fri 2/18/22
1039	Harris,WSH		Mobilization / Layout	1 day	Fri 2/18/22
1040	Harris,WSH		Install Lines and Antennas	1 day	Mon 2/21/22
1041	Harris,WSH		Provide re-line drawing to colocation owner	1 day	Tue 2/22/22
1042	Harris,WSH		Punchlist items identified and resolved	1 day	Wed 2/23/22
1043	Harris,WSH		Site Accepted by Harris and Customer	1 day	Thu 2/24/22
1044	Harris,WSH		W/Peavine P25 RF Site	5 days	Fri 2/25/22
1050	Harris,WSH		W/Red Peak P25 RF Site	44 days	Fri 2/25/22
1070	Harris,WSH		W/Virginia Peak P25 RF Site	5 days	Fri 2/25/22



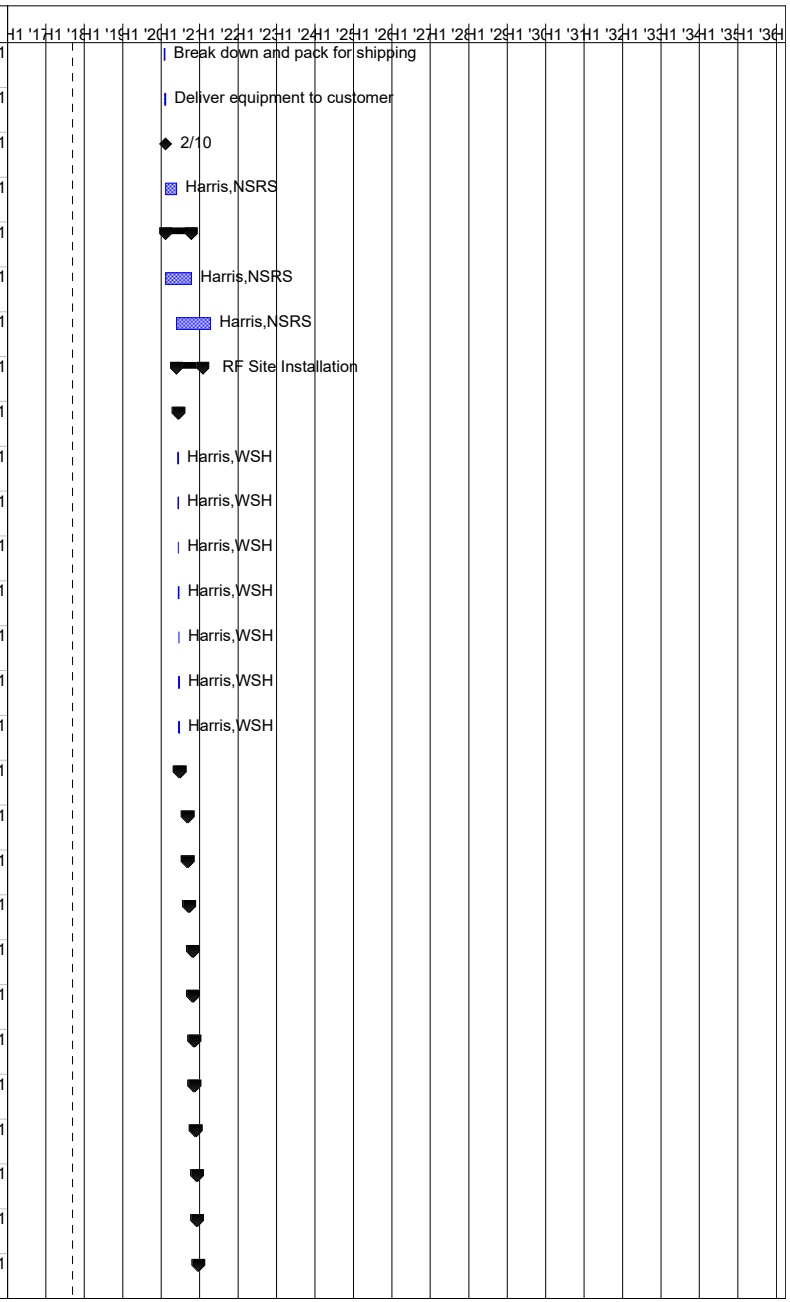
ID	Resource Names	Region	Name	Duration	Start
1076	Harris,WS		W/Marble Bluff P25 RF Site	5 days	Fri 2/25/22
1088	Harris,WS		W/Poito P25 RF Site	5 days	Fri 3/4/22
1094	Harris,WS		W/Truckee 18 P25 RF Site	5 days	Fri 3/4/22
1106	Harris,WS		W/Fox P25 RF Site	5 days	Fri 3/11/22
1112	Harris,WS		W/Fortyniner Mt P25 RF Site	44 days	Fri 3/11/22
1132	Harris,WS		W/Yellow Peak P25 RF Site	44 days	Fri 3/11/22
1383	Harris,NSR	All	Training	175 days	Tue 10/1/19
1384	**Harris,NS**		**Cutover planning**	**60 days**	**Mon 5/20/19**
1385	Harris,NSR		Create Group Structure / Fleet Maps	20 days	Mon 5/20/19
1386	Harris,NSR		Fleet Maps approved	10 days	Tue 6/18/19
1387	Harris,NSR		Develop Radio Personalities	10 days	Tue 7/2/19
1388	Harris,NSR		Develop a formal user cutover plan in conjunction with customer	20 days	Wed 7/17/19
1391	**Harris,NS**	**Region #0/1**	**VIDA Network Switching Center's (NSC's) & Region #0-1 Implementation**	**502.5 days**	**Mon 5/20/19**
1392	Harris,NSR		NSC & Region #0/1 LMR Manufacturing	55 days	Mon 5/20/19
1393	Harris,NSR		Place orders on factory	5 days	Mon 5/20/19
1394	Harris,NSR		Place orders on vendors	5 days	Tue 5/28/19
1395	Harris,NSR		Manufacture P25 Radio System	10 wks	Tue 5/28/19
1396	Harris,NSR		Factory Staging	39 days	Wed 8/7/19
1397	Harris,NSR		Assemble & Stage Region #0/1	25 days	Wed 8/7/19
1398	Harris,NSR		Conduct Customer Staginig Acceptance Test Plan (SATP)	5 days	Wed 9/11/19
1399	Harris,NSR		Break down and pack for shipping	4 days	Wed 9/18/19
1400	Harris,NSR		Deliver equipment to customer	5 days	Tue 9/24/19
1401	Harris,NSR		System Infrastructure Shipment and Delivery Acceptance - Bil	0 days	Mon 9/30/19
1402			System Installation	408.5 days	Tue 10/1/19
1403	Harris,NSR		NSC Infrastructure Installation	17 days	Tue 10/1/19
1404	Harris,NSR		P25 Primary Network Switching Center	7 days	Tue 10/1/19



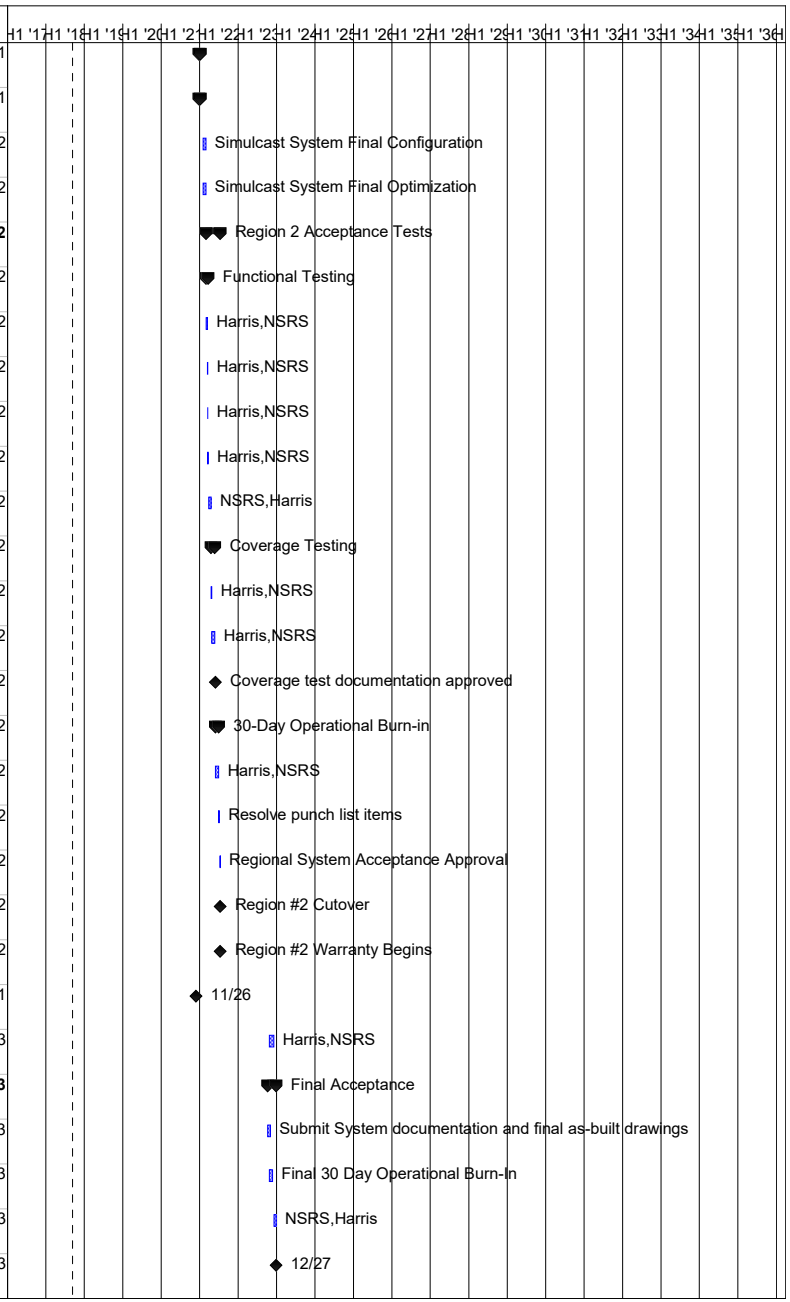
ID	Resource Names	Region	Name	Duration	Start
1405	Harris,NSF		Install Primary Network Switching Center	2 days	Tue 10/1/19
1406	Harris,NSF		Ground all equipment and connect to backhaul	1 day	Thu 10/3/19
1407	Harris,NSF		Apply power and test NSC network	2 days	Fri 10/4/19
1408	Harris,NSF		Install Trunked Logging Recorder	2 days	Tue 10/8/19
1409	Harris,NSF		Final site clean up.	0.5 days	Tue 10/8/19
1410	Harris,NSF		P25 Secondary Network Switching Center	5 days	Tue 10/1/19
1411	Harris,NSF		Install Primary Network Switching Center	2 days	Tue 10/1/19
1412	Harris,NSF		Ground all equipment and connect to backhaul	1 day	Thu 10/3/19
1413	Harris,NSF		Apply power and test NSC network	2 days	Fri 10/4/19
1414	Harris,NSF		Final site clean up.	0.5 days	Fri 10/4/19
1415	Harris,NSF		Primary P25 VIDA Connect Switching Centers	7 days	Tue 10/8/19
1416	Harris,NSF		Install Primary Network Switching Center	2 days	Tue 10/8/19
1417	Harris,NSF		Ground all equipment and connect to backhaul	1 day	Thu 10/10/19
1418	Harris,NSF		Apply power and test NSC network	2 days	Fri 10/11/19
1419	Harris,NSF		Install Trunked Logging Recorder	2 days	Tue 10/15/19
1420	Harris,NSF		Final site clean up.	0.5 days	Tue 10/15/19
1421	Harris,NSF		Secondary P25 VIDA Connect Switching Centers	4 days	Tue 10/8/19
1426	Harris,NSF		Primary P25 VIDA Connect Switching Centers	6 days	Wed 10/16/19
1432	Harris,NSF		Secondary P25 VIDA Connect Switching Centers	4 days	Wed 10/16/19
1437	Harris,NSF		NSC Installation Complete - Billing Milestone	0 days	Mon 10/21/19
1911		**Region #2**	**Region #2 Implementation**	**403 days**	**Fri 9/11/20**
1912	Harris,NSF		Cutover planning	5 days	Wed 10/7/20
1913	Harris,NSF		LMR Manufacturing	60 days	Fri 9/11/20
1914	Harris,NSF		Place orders on factory	5 days	Fri 9/11/20
1915	Harris,NSF		Place orders on vendors	5 days	Fri 9/18/20
1916	Harris,NSF		Manufacture P25 Radio System	10 wks	Fri 9/25/20
1917	Harris,NSF		Factory Staging	39 days	Tue 12/8/20
1918	Harris,NSF		Assemble, Stage and Run Factory Acceptance Test (FAT)	30 days	Tue 12/8/20



ID	Resource Names	Region	Name	Duration	Start
1919	Harris,NSF		Break down and pack for shipping	4 days	Thu 1/28/21
1920	Harris,NSF		Deliver equipment to customer	5 days	Wed 2/3/21
1921	Harris,NSF		Region 2 System Infrastructure Shipment and Delivery Accept	0 days	Wed 2/10/21
1922	Harris,NSF		Install Dispatch Console and Control Station	74 days	Wed 2/10/21
1923	Harris,NSF		Portable Radio and Mobile Cutover	175 days	Wed 2/10/21
1924	Harris,NSF		Program and install mobile radios/Distribute Portable	35 wks	Wed 2/10/21
1925	Harris,NSF		Training	230 days	Tue 5/25/21
1926	Harris,NSF	Region #2	RF Site Installation	180 days	Tue 5/25/21
1951	Harris,WS		W/Snowflake P25 RF Site	9 days	Mon 6/7/21
1952	Harris,WS		Install P25 RF Site equipment, ground all equipment and	2 days	Mon 6/7/21
1953	Harris,WS		Install GPS Antenna Systems.	1 day	Wed 6/9/21
1954	Harris,WS		Make all RF cables & connections	1 day	Thu 6/10/21
1955	Harris,WS		Connect all alarms points to alarm system	3 days	Fri 6/11/21
1956	Harris,WS		Apply power, set levels and parameters	1 day	Wed 6/16/21
1957	Harris,WS		Preliminary Functional Testing	1 day	Thu 6/17/21
1958	Harris,WS		Final site clean up	0.5 days	Fri 6/18/21
1967	Harris,WS		W/Biltmore P25 RF Site	9 days	Fri 6/18/21
2055	Harris,WS		W/Slide P25 RF Site	9 days	Thu 9/2/21
2063	Harris,WS		W/Smokey Quarts P25 RF Site	9 days	Thu 9/2/21
2071	Harris,WS		W/Tahoe SC P25 RF Site	9 days	Wed 9/15/21
2111	Harris,WS		W/Chimney Peak P25 RF Site	9 days	Fri 10/22/21
2119	Harris,WS		W/Peavine P25 RF Site	9 days	Fri 10/22/21
2127	Harris,WS		W/Red Peak P25 RF Site	9 days	Thu 11/4/21
2135	Harris,WS		W/Virginia Peak P25 RF Site	9 days	Thu 11/4/21
2143	Harris,WS		W/Marble Bluff P25 RF Site	9 days	Wed 11/17/21
2159	Harris,WS		W/Poito P25 RF Site	9 days	Tue 11/30/21
2167	Harris,WS		W/Truckee 18 P25 RF Site	9 days	Tue 11/30/21
2183	Harris,WS		W/Fox P25 RF Site	9 days	Mon 12/13/21



ID	Resource Names	Region	Name	Duration	Start
2191	Harris,WS		W/Fortyniner Mt P25 RF Site	9 days	Fri 12/24/21
2199	Harris,WS		W/Yellow Peak P25 RF Site	9 days	Fri 12/24/21
2231	Harris,NSF		Simulcast System Final Configuration	20 days	Tue 2/1/22
2232	Harris,NSF		Simulcast System Final Optimization	20 days	Tue 2/1/22
2233	**Harris,NS**		**Region 2 Acceptance Tests**	**97 days**	**Tue 3/1/22**
2234	Harris,NSF		Functional Testing	14 days	Tue 3/1/22
2235	Harris,NSF		Run Functional Test at each RF site	10 days	Tue 3/1/22
2236	Harris,NSF		Final Site inspections @ new sites	2 days	Tue 3/15/22
2237	Harris,NSF		Run Functional Test at Dispatch Center	1 day	Thu 3/17/22
2238	Harris,NSF		Submit Functional test documentation	1 day	Fri 3/18/22
2239	NSRS,Har		Functional test documentation approved	15 days	Mon 3/28/22
2240	Harris,NSF		Coverage Testing	25 days	Mon 4/18/22
2241	Harris,NSF		Run coverage test (automated signal strength) (CATP)	1 wk	Mon 4/18/22
2242	Harris,NSF		Voice Quality Coverage Test (CATP)	4 wks	Mon 4/25/22
2243	NSRS,Har		Coverage test documentation approved	0 days	Mon 5/30/22
2244	Harris,NSF		30-Day Operational Burn-in	22 days	Mon 5/30/22
2245	Harris,NSF		Conduct 30-Day Operational Burn-in	30 edays	Mon 5/30/22
2246	Harris,NSF		Resolve punch list items	1 wk	Wed 6/29/22
2247	NSRS,Har		Regional System Acceptance Approval	1 day	Wed 7/13/22
2248	Harris,NSF		Region #2 Cutover	0 days	Thu 7/14/22
2249	Harris,NSF		Region #2 Warranty Begins	0 days	Thu 7/14/22
2250	Harris,NSF		Region 2 Installation Complete - Billing Milestone	0 days	Fri 11/26/21
2552	Harris,NSF		Perform Software Updates for Region 1 & 2	30 days	Tue 10/24/23
2553	**Harris,NS**	**All**	**Final Acceptance**	**58 days**	**Mon 10/9/23**
2554	Harris,NSF	All	Submit System documentation and final as-built drawings	20 days	Mon 10/9/23
2555	Harris,NSF	All	Final 30 Day Operational Burn-In	30 edays	Mon 10/23/23
2556	NSRS,Har	All	Sign Letter of Final Acceptance	15 days	Thu 12/7/23
2557	Harris,NSF		System Acceptance Testing Complete - Billing Milestone	0 days	Wed 12/27/23



Part Number	Description	Quantity
	NORTH	
	ANTENNA SYSTEM EQUIPMENT	
7242	Filter,Lightening,100-512MHz	8
AW-L1-PNMNM-50	Cable,GPS Antenna,50ft	12
CA-015466-001	Cable,Coaxial,1/2in Superflex	4155
CA-015471-001	Cable,Coaxial,1 5/8in,Low Loss Foam	5030
CA-015474-001	Cable,Coaxial,7/8in,Low Loss Foam	2930
CN-009256	Connector,NF,7/8in Coax,O-Ring Sealing	30
CN-014877-001	Connector,N Female,For 1/2in Coax	42
E75-4000-007	SURGE SUPPRESSOR,800-2500MHZ BROADBAND	21
E75-4000-143	SURGE FILTER,DC BLOCK 698MHZ-2.7GHZ FEM	21
J90-0114-021	CONN 7/16 DIN FEMALE COAX CABLE 1-5/8"	42
KT-014844-001	Kit,Coax Hoisting Grip,1 5/8 in	21
KT-014859-001	Kit,Hoisting Grip,7/8 in Cable	15
KT-014860-001	Kit,Cable Boot,4 in,3 Holes,1/2 in Cable	15
KT-014861-001	Kit,Cable Boot,4 in,For One 7/8 in Cable	15
KT-014862-001	Kit,Cable Boot,4 in,For One 1 5/8 in Ca	21
KT-014874-001	Kit,Hoisting Grip,1/2 in Cable	15
LCF12-50J	Cable,Coaxial,1/2in Low Loss,LCf12-50J	2930
NM-SCF12-070	Connector,Rapid Fit,SCF12-50 NM	60
PT-018602-001	Filter,Surge Protector,800-2500MHz	12
SA-KRE1011217/02	ANTENNA,1574-1606 MHZ,WITH MOUNT	12
W90-0100-009	CABLE ASSY, SURE FLEX N MALE-N MALE 4FT	21
W90-0100-011	CABLE ASSY, SURE FLEX N MALE-N MALE 6FT	21
W90-0100-025	CABLE ASSY, SURE FLEX DIN(M)-DIN(M) 10FT	21
W90-0223-701	CABLE ASSY BNC(M) TO SMA(M) RG223 72 IN	163
	ANTENNA SYSTEM EQUIPMENT - SITES	
DSCC85-08DS	851-869 MHz 8 Channel Ceramic Cavity Combiner with SMARTune Power Monitor DIN Output	2
CP00921-8	COMBILENT 700/800 MHz 8 PORT RECEIVER MULTICOUPLER	6
CP00732	COMBILENT TOWER TOP AMP	15
SC432D-HF6LDF(D00-I40-	SC432 DUAL 746-869 MHZ 6 DBD GN 40	2
DSCC85-06DS	851-869 MHz 6 Channel Ceramic Cavity Combiner with SMARTtune Power Monitor DIN Output	4
SC479-HF1LDF(D02-	COLL OMNI 746-869 MHz 9 DB NULL FILL	6
SC412-HF2LDF(D01-E5608)	SC412 746-869 MHZ 11.5 DBD NUL FILL - RX	2
DSCC75-10DS	763-776 MHz 10 Channel Ceramic Cavity Combiner with SMARTtune Power Monitor DIN output	6
CP00921-16, CP11151	COMBILENT 700/800 MHz 16 PORT RECEIVER MULTICOUPLER	7
DS7A08F36U-D	746-869 MHz 8 dB Gain Omni Fiberglass Antenna with DIN connector - TX	2
DS7C10F36U-D	764-869 MHz 10 dB Gain Omni Fiberglass Antenna with DIN connector - RX	5
CP00921-24, CP11151, CP01102	COMBILENT 700/800 MHz 24 PORT RECEIVER MULTICOUPER	2
SC412-HF2LDF(D01-	SC412 746-869 MHZ 11.5 DBD NUL FILL - RX	1
700/800 MHz Low Loss Diplexer	MD178	1
DSCC85-10DS	851-869 MHz 10 Channel Ceramic Cavity Combiner with SMARTtune Power Monitor DIN Output	2
SC412-HF2LDF(E5608)	SC412 746-869 MHZ 11.5 DBD GN NULL - RX	1
DS7A06F36U3D	746-869 MHz 6 dB Gain Omni Fiberglass Antenna with DIN connector 3 Degree downtilt - TX	3
DSCC85-04DS	851-869 MHz 4 Channel Ceramic Cavity Combiner with SMARTtune Power Monitor DIN Output	3
SC412-HF2LDF(D00-	SC412 746-869 MHZ 11.5 DBD GN NULL - RX	1
DSCC85-07DS	851-869 MHz 7 Ch Combiner with SMARTune Power Monitor	2

Part Number	Description	Quantity
SE419-SWBPALDF(D08-E6461)_130D	764-960 MHz 11-15 dB Gain Directional Antenna with DIN connector 3 Degree downtilt - TX	3
DS7C10F36U3D	764-869 MHz 10 dB Gain Omni Fiberglass Antenna with DIN connector 3 Degree downtilt - TX	6
DSCC75-06DS	763-776 MHz 6 Channel Ceramic Cavity Combiner with SMARTtune Power Monitor DIN output	2
DS7A06F36U6D	746-869 MHz 6 dB Gain Omni Fiberglass Antenna with DIN connector 6 Degree downtilt - TX	1
P25 AND CONVENTIONAL SITE EQUIPMENT		
MASA-NCL7D	Kit,Cable,Ethernet,5ft	7
MASA-SVP25	Site Interface Equipment,P25T MASTR V	7
SA-MD6H	OSCILLATOR, 10MHZ REF,-12VDC,6 PORT	7
SA-MD7B-DC	Assy,Controller,SitePro,MME w/ Cables DC	1
SA-MD7E-DC	Controller,P25 MME Data,Addl Site,DC	6
SAMD7Y-DC	KIT, NET SENTRY, CNTL/DATA, DC PWR,WIN10	13
SA-MR1J	RACK,OPEN,84 IN,SEISMIC	7
SASG9N	Feature,P25 Multisite Support	7
MASTR V STATIONS		
MASV-700M1	Station,MASTR V,P25T,700MHz	84
MASV-800M1-A	STATION,MASTR V,P25T,800 MHZ,799-817 RX	41
MASV-NCL8Z	Cable,DC Power 60in	1
MASV-NMA6Q	Grounding Shim,28RU	20
MASV-NSG9K	Feature,Software,P25 Phase 2	125
MASV-NZN8R	Panel,Blank Module,MASTR V	37
MASV-XXXXX	MASTR V,Dummy Model Number	7
SV-AT1B	TERMINATION,50 OHM LOAD	57
SV-AW5L	Power Amplifier,Linear,700 MHz	84
SV-AW5R-A	POWER AMPLIFIER,LINEAR,800 MHZ	41
SV-CA5J	CABLE,DC POWER,48 IN	66
SV-CK1K	Cable,Freq ref,Cabinet to Cabinet,16 Ft	13
SV-CL2B	Cable,Splitter-Baseband #1	8
SV-CL2C	Cable,Splitter-Baseband #2	6
SV-CL2D	Cable,Xconnect-Baseband Shelf #1	38
SV-CL2D-DC	Cable,3560v2 Switch, DC Power	20
SV-CL2E	Cable,Xconnect-Baseband Shelf #2	26
SV-CL2F	Cables,Xconnect-Xconnect	7
SV-CL2N	Cable Assembly RF,RG223,BNC/SMA,5ft	64
SV-CL2V	Cable,RF,RG223,BNC/SMA,20ft	12
SV-CL9T	Cable,Switch-Switch	7
SV-CL9V	Kit,Cable,Ch #1,2,9,10,17,18 MASTR V IP	40
SV-CL9W	Kit,Cable,Ch #3,4,11,12,19,20 MASTR V IP	34
SV-CL9X	Kit,Cable,Ch #5,6,13,14,21,22 MASTR V IP	27
SV-CL9Y	Kit,Cable,Ch #7,8,15,16,23,24 MASTR V IP	24
SV-CL9Z	Cable Assembly RF,RG223,BNC/SMA,4ft	28
SV-CN1B	POWER STRIP,-48VDC LOW PWR DIST,SEISMIC	20
SV-CN7Z	POWER STRIP,-48VDC HIGH PWR DIST,RACK	34
SV-DW1B	Drawings,IP Simulcast/P25 Trunked	20
SV-MN2Z	PANEL,BLANK,PS CHASSIS	6
SV-MN9S	Panel,Blank,1 RU	20
SV-MR1J	RACK,OPEN,84 IN,SEISMIC	22
SV-NZN8S-DC	Fan Tray,MASTR V, DC	20
SV-PM1C	Processor,Baseband Module,MASTR V	64
SV-PS2P-DC	Power Supply,-48V,DC,MASTR V	131
SV-RB3A	Power Supply Shelf,2nd Position	20
SV-RB3B	Power Supply Shelf,1st Position	20
SV-RB3C	Power Supply Shelf	91

Part Number	Description	Quantity
SV-RB3G	Shelf,14-Slot,Open Rack	34
SV-RB3K	Busbar,HPA/PS,MASTR V	124
SV-SP2T	Programming,Multisite	41
SV-SP2U	Programming,IP Simulcast	84
SV-ZM1X	KIT,REDUNDANT POWER SUPPLY	34
SV-ZN9K	PANEL,XCONNECT,MASTR V	20
SV-ZN9L	Panel,Splitter, Expansion Cabinet	6
	Locking Cabinets	4
SIMULCAST EQUIPMENT		
SCCF7X	Cable,RF Sensor,30ft	6
SCCL7D	Kit,Cable,Ethernet,5ft	6
SC-MD7B-DC	ASSY,CONTROLLER,SITEPRO,MME W/ CABLES DC	6
SC-MR1J	RACK,OPEN,84 IN,SEISMIC	6
SC-SG4H	LICENSE,SW,CP	3
SC-SG4N	LICENSE,SW, ADDITIONAL CP	3
SC-VTXP25-DC	MASTR V IP Simulcast,Tx Site,Comm Equip	6
VIDA NETWORKING & SECURITY		
VS-CJ1Y	POWER SUPPLY ,DC, ISR4321	12
VS-CJ2W	POWER SUPPLY,DC,ISR4221	14
VS-CR1F	ROUTER,ISR4221/K9	14
VS-CR89	ROUTER,ISR4321	12
VS-CU5C	SWITCH,CISCO ME 3400E,DC,24-PORT	26
VS-CU7Z	MODULE,NIM 4PORT LAYER2 GE	26
VSMA7B	KIT,MOUNTING HARDWARE, CISCO ME3400	26
VS-MN3G	KIT, CISCO 4321 ROUTER, SITE MTG	12
VS-MN3T	KIT, CISCO 4221 ROUTER, SITE MTG	14
VSVS01	VS PROD GRP, CONFIGURED MODEL NUMBER	13
SS-SW1E	RPM/RPM2 WITH ANNUAL UPDATES (NO DONGLE)	4
AE/LZY213771/1	SW,Dist Kit,ProFile Manager	4
VS-CU5C	SWITCH,CISCO ME 3400E,DC,24-PORT	15
VSMA7B	KIT,MOUNTING HARDWARE, CISCO ME3400	15
VIDA PREMIER CONNECT CORE		
NS-PNSJ	SERVER, VIDA PREMIER, SR10A.4	1
NS-SN5K	SERVICE,SYBASE LICENSE	2
NS-VM2L	SOFTWARE,CONNECT CORE,VM	1
NS-CA5G	CABINET,NSS,42 RU,120V	1
NS-ZM2F	POWER KIT,SR10A.4,VIDA CONNECT,110VAC	1
NS-ZM2E	CABLE KIT, SR10A.4, VIDA CONNECT	1
NS-NP1P	Kit,Automatic Transfer Switch,100-120V	1
NS-NP1L	Cable,IEC to C13 Power Cord (6ft)	8
NS-NP1H	Kit,Seismic Zone 4,Bolt Down	1
NS-DW1U	DRAWINGS,UNITE/CONNECT,SR10A.4	1
VSVS02	VIDA Security, NSC	1
CM-027501-100102	License,Quest Authentication,Server	8
VS-CR99	ROUTER,ISR4351,APPX LIC	1
VS-MN3L	KIT, CISCO 4351 ROUTER, NSC MTG	1
VS-CR1E	ROUTER,C881-K9,ADV IP SVC	1
VS-CR92	SWITCH,CATALYST 3650 24P IP	1
VS-CU7Z	MODULE,NIM 4PORT LAYER2 GE	1
MANM-NSG9C	License,Quad Mode Vocoder	1
NS-SH1H	LICENSE,P25 SITE,CONNECT	15
NS-SH1J	LICENSE,P25 SITE TALKPATH,CONNECT	174
NS-SH1M	LICENSE,IP LOGGING RECORDER,CONNECT	4
NS-SH1N	LICENSE,IP LOGGING RECORDER TP,CONNECT	384
NS-SG2Y	LICENSE,VIDA CONNECT	1
NS-SH1D	LICENSE,P25 APPLICATION,CONNECT	1

Part Number	Description	Quantity
NS-SH1R	LICENSE,LOCATION HA,CONNECT	1
NS-PNSM	SERVER, VIDA MGMT TERMINAL	1
MANS-NCU3D	Kit,1RU Monitor,Key Board,Mouse,KVM	1
VSSD03	LICENSE,SUMS,ENDPOINT	70
VSSD04	LICENSE,SUMS,CORE	40
VS-SG3V	LICENSE,HOST SECURITY,AV,EPO,QTY 101-250	112
VS-SG4A	LICENSE,HOST SECURITY(HIDS),101-250	112
VS-SH6M	LICENSE, ENM P-RTU, + 3 YR SUPP, LRG	4500
NS-SH1A	LICENSE,VIDA CONNECT CONNECTION	1
NS-SN2H	LICENSE,VMWARE,VCENTER,STANDARD	1
NS-SN2J	LICENSE,VMWARE,VCENTER,STANDARD,3YR	1
NS-DF3G	PC,SYSTEM MANAGEMENT TERMINAL	10
VIDA PREMIER CORE - SECONDARY		
NS-PNSJ	SERVER, VIDA PREMIER, SR10A.4	1
NS-SN5K	SERVICE,SYBASE LICENSE	2
NS-CA5G	CABINET,NSS,42 RU,120V	1
NS-ZM2A	POWER KIT,SR10A.4,LOC HA/UNITE,110VAC	1
NS-ZM1Y	CABLE KIT,SR10A.4,LOCATION HA/UNITE	1
NS-NP1P	Kit,Automatic Transfer Switch,100-120V	1
NS-NP1L	Cable,IEC to C13 Power Cord (6ft)	8
NS-NP1H	Kit,Seismic Zone 4,Bolt Down	1
MANS-CP9B	Netclock,GPS Master Clock	1
MANS-AN3S	Kit,GPS Antenna,Outdoor,For Netclock	1
MANS-CK1A	Cable,GPS Ant Outdoor,100ft/Netclock	1
NM-VM2B	SOFTWARE,PREMIER CORE,VM	1
VSVS02	VIDA Security, NSC	1
VS-CR99	ROUTER,ISR4351,APPX LIC	1
VS-MN3L	KIT, CISCO 4351 ROUTER, NSC MTG	1
VS-CR84	FIREWALL,ASA5508-X W/SEC+/FIREPOWER	1
VS-CN1J	SERVER,UNITRENDS RS606 BACKUP APPLIANCE	1
VSCR21	FIREWALL, ASA5506-X W/SEC+/ANYCON-25USR	1
VS-MA7D	KIT, RACKMNT, 5506	1
VS-CU7Z	MODULE,NIM 4PORT LAYER2 GE	1
VS-CR92	SWITCH,CATALYST 3650 24P IP	1
VS-CR1E	ROUTER,C881-K9,ADV IP SVC	1
VS-CR1Y	ROUTER,ISR,C1111-4P,SEC	1
MANM-NSG9C	License,Quad Mode Vocoder	1
NM-NG2C	LICENSE, SQL SERVER 2016 STD, BASE 4CORE	1
SS-SW1E	RPM/RPM2 WITH ANNUAL UPDATES (NO DONGLE)	4
AE/LZY213771/1	SW,Dist Kit,ProFile Manager	4
INTEROPERABILITY GTWY		
MANG-4DVUS	Chassis,4-Slot Interoperability Gateway	15
MANG-GTWY	System Equipment,Interop Gateway	15
MANG-MN2A	Panel,Filler	30
MANG-NAA3E	Module,DVU,UAC,Interoperability Gateway	30
MANG-NCA3L	Cable,Audio,4-Slot Chassis GWB,10ft	120
MANG-NCL8S	Cable,Ethernet,6ft	30
MANG-NFW2C	SOFTWARE,UAC GWB,AES	15
MANG-NMN2U	Bracket Kit, Interoperability Gateway	15
MANG-NPS2K	Power Supply,DC,4-Slot Gateway Chassis	30
MANG-NSN6N	License,DVU OTAR	120
MANG-SN5M	SERVICE,QUAD MODE VOCODER LICENSE	120
NS-SG2F	LICENSE,NETWORK FIRST APPLICATION	1
NS-SG2G	LICENSE,NETWORK FIRST SITE	15
NS-SH1E	LICENSE,NETWORKFIRST APPLICATION,CONNECT	1
NS-SH1P	LICENSE,NETWORK FIRST TALKPATH,CONNECT	120
SV-MR1J	RACK,OPEN,84 IN,SEISMIC	15
VS-CJ2W	POWER SUPPLY,DC,ISR4221	30

Part Number	Description	Quantity
VS-CR1F	ROUTER,ISR4221/K9	30
VS-CU5C	SWITCH,CISCO ME 3400E,DC,24-PORT	15
VS-CU7Z	MODULE,NIM 4PORT LAYER2 GE	30
VSMA7B	KIT,MOUNTING HARDWARE, CISCO ME3400	15
VS-MN3T	KIT, CISCO 4221 ROUTER, SITE MTG	30
VSVS01	VS PROD GRP, CONFIGURED MODEL NUMBER	15
DISPATCH CONSOLES		
14031-0004-11	WIN 10, 64BIT, LTSB	27
2C-CM22218-0305	HEADSET,OVER-THE HEAD SOLID BOOM	24
CM-022218-001101	License,Vocoder	12
CM-022218-3006WJ	Adapter,6 Wire Jackbox to Headset	24
MM100UD	MANUAL,OP/INSTA/CONFIG,SYMPHONY,CD	12
UD-AB1A	SPEAKER, NANO, SYMPHONY	24
UD-AB1B	JACK BOX, 6 WIRE	24
UD-AB1D	SINGLE FOOTSWITCH, USB, SYMPHONY	24
UD-AB1F	MOUSE, OPTICAL, USB, SCROLL WHEEL	12
UD-AB1G	KEYBOARD, 104 KEY, USB	12
UD-AB1K	CABLE,DISPLAYPORT TO DVI-D,10FT	12
UD-AB1M	DESK MIC, DB9	12
UD-CU6U	MONITOR, 23" CLASS,HIGH DEF	12
UD-SG1F	SOFTWARE,REMOTE BATON	5
UD-SG4T	LICENSE,CONVENTIONAL CONTROLS	12
UD-SG4W	LICENSE,AES AND DES LEVEL ENCRYPTION	12
UD-SG4Y	LICENSE,REMOTE AUX I/O	12
UD-SH2L	LICENSE,MARKER TONE	12
UD-SH4U	LICENSE,RADIO UNIT MONITOR	12
UD-SH4W	LICENSE,SIP,ADD 4 EXTENSIONS,8 CALLS	12
UD-SH5B	LICENSE,BASE SIP,ADD TO ENT/PREM BUNDLE	12
UD-SW1N	SW,SYMPHONY PC APP & WIN 10 IMAGE	10
UD-ZM1E	CONSOLE,BUNDLE,PREMIER,WIN10	12
VS-CR1F	ROUTER,ISR4221/K9	14
VSCU3H	SWITCH,CISCO 2960 PLUS	14
VS-CU7Z	MODULE,NIM 4PORT LAYER2 GE	14
VSMA6N	KIT,MTG HDWR,CISCO 2960 MASTR III/V CAB	14
VS-MN3T	KIT, CISCO 4221 ROUTER, SITE MTG	14
NS-SH1F	LICENSE,CONSOLE,CONNECT	12
NS-SH1G, NS-SG2C	LICENSE,CONSOLE TALKPATH,CONNECT	144
LOGGING RECORDER		
Hindsight 600 G3	Logging Recorder (Washoe)	1
Hindsight 600 G3	Logging Recorder (WCSD)	1
ASSET MANAGEMENT SYSTEM		
CommSHOP	Assest Management System Upgrade	1

Part Number	Description	Quantity
	SITE-ON-WHEELS	
Eaton	UPS	1
MANM-NSG8W	Software,Device Manager	1
MASA-NCL7D	Kit,Cable,Ethernet,5ft	1
MASA-SVP25	Site Interface Equipment,P25T MASTR V	1
MASV-700M1	Station,MASTR V,P25T,700MHz	4
MASV-NMA6Q	Grounding Shim,28RU	1
MASV-NSG9K	Feature,Software,P25 Phase 2	4
SA-MD6H	OSCILLATOR, 10MHZ REF,-12VDC,6 PORT	1
SA-MD7B-DC	Assy,Controller,SitePro,MME w/ Cables DC	1
SAMD7Y-DC	KIT, NET SENTRY, CNTL/DATA, DC PWR,WIN10	1
SA-MR1J	RACK,OPEN,84 IN,SEISMIC	1
NM-SG9B	LICENSE,DEVICE MANAGER PREMIUM	1
SV-AT1B	TERMINATION,50 OHM LOAD	5
SV-AW5L	Power Amplifier,Linear,800 MHz	4
SV-CA5J	CABLE,DC POWER,48 IN	2
SV-CL2D	Cable,Xconnect-Baseband Shelf #1	2
SV-CL2N	Cable Assembly RF,RG223,BNC/SMA,5ft	2
SV-CL2D-DC	Cable,3560v2 Switch, DC Power	1
SV-CL9V	Kit,Cable,Ch #1,2,9,10,17,18 MASTR V IP	2
SV-CL9W	Kit,Cable,Ch #3,4,11,12,19,20 MASTR V IP	2
SV-CN1B	POWER STRIP,-48VDC LOW PWR DIST,SEISMIC	1
SV-CN7Z	POWER STRIP,-48VDC HIGH PWR DIST,RACK	1
SV-DW1B	Drawings,IP Simulcast/P25 Trunked	1
SV-MN9S	Panel,Blank,1 RU	1
SV-NZN8S-DC	Fan Tray,MASTR V, DC	1
SV-PM1C	Processor,Baseband Module,MASTR V	2
SV-PS2P-DC	Power Supply,-48V,DC,MASTR V	4
SV-RB3A	Power Supply Shelf,2nd Position	1
SV-RB3B	Power Supply Shelf,1st Position	1
SV-RB3C	Power Supply Shelf	2
SV-RB3G	Shelf,14-Slot,Open Rack	1
SV-RB3K	Busbar,HPA/PS,MASTR V	4
SV-SP2T	Programming,Multisite	4
SV-ZN9K	PANEL,XCONNECT,MASTR V	1
VS-CJ2W	POWER SUPPLY,DC,ISR4221	1
VS-CR1F	ROUTER,ISR4221/K9	1
VS-CU5C	SWITCH,CISCO ME 3400E,DC,24-PORT	1
VSMA7B	KIT,MOUNTING HARDWARE, CISCO ME3400	1
VS-MN3T	KIT, CISCO 4221 ROUTER, SITE MTG	1
VSVS01	VS PROD GRP, CONFIGURED MODEL NUMBER	1
C000070L010A	MW_AA Positioner, Quick Dep	2
C050067B004A	MW_ PTP670 Int ODU	2
TRAILER/ENCLOSURE	INTEGRATED TRAILER SITE	1
	SITE ON WHEELS ANTENNA SYSTEM EQUIPMENT	
SCAN1W	Power Sensor,403-1000MHz	1
SCCF7X	Cable,RF Sensor,30ft	1
E75-4003-015	ANTENNA,10DB,764-869MHZ,DIN	1
W90-0100-025	CABLE ASSY, SURE FLEX DIN(M)-DIN(M) 10FT	1
E75-4000-143	SURGE FILTER,DC BLOCK 698MHZ-2.7GHZ FEM	1
J90-0114-201	CONN 7-16 DIN MALE COAX CABLE RGHT ANGLE	1
J29-0110-001	CONN 7-16 DIN MALE FOR 1/2" COAX CABLE	1
NM-SCF12-071	Connector,NM For 1/2in Coax,Right Angle	2
W90-0100-009	CABLE ASSY, SURE FLEX N MALE-N MALE 4FT	1
W90-0100-011	CABLE ASSY, SURE FLEX N MALE-N MALE 6FT	1
E75-4000-007	SURGE SUPPRESSOR,800-2500MHZ BROADBAND	1
W90-0223-701	CABLE ASSY BNC(M) TO SMA(M) RG223 72 IN	2
CN-014877-001	Connector,N Female,For 1/2in Coax	2
CN-009256	Connector,NF,7/8in Coax,O-Ring Sealing	2

Part Number	Description	Quantity
KT-018357-001	Kit,Grounding For 7/8in Coaxial,60in	6
KT-018357-002	Kit,Grounding For 1/2in Coaxial	6
KT-014859-001	Kit,Hoisting Grip,7/8 in Cable	1
KT-014874-001	Kit,Hoisting Grip,1/2 in Cable	1
CA-015474-001	Cable,Coaxial,7/8in,Low Loss Foam	125
LCF12-50J	Cable,Coaxial,1/2in Low Loss,LCf12-50J	125
CA-015466-001	Cable,Coaxial,1/2in Superflex	170
NM-SCF12-070	Connector,Rapid Fit,SCF12-50 NM	4
KT-014860-001	Kit,Cable Boot,4 in,3 Holes,1/2 in Cable	1
KT-014861-001	Kit,Cable Boot,4 in,For One 7/8 in Cable	1
DSCC75-04DSX	4-ch transmit combiner	1
Multiplexer	Milled duplexer	1
CP00921-8	COMBILENT 700/800 MHz 8 PORT RECEIVER MULTICOUPER	1
RADIOS		
	Please see EX_6_ WAS _SOW_Price_Schedule for radio models and quantities	
SPARES		
SPARE MASTR V		
MASV-700M1	Station,MASTR V,P25T,700MHz	4
MASV-NSG9K	Feature,Software,P25 Phase 2	8
SV-AW5L	Power Amplifier,Linear,700 MHz	6
SV-RB3K	Busbar,HPA/PS,MASTR V	8
SV-PS2P-DC	Power Supply,-48V,DC,MASTR V	12
SV-SP2T	Programming,Multisite	8
SV-RB3B	Power Supply Shelf,1st Position	2
SV-CA5J	CABLE,DC POWER,48 IN	4
SV-ZM1X	KIT,REDUNDANT POWER SUPPLY	2
SV-DW1B	Drawings,IP Simulcast/P25 Trunked	2
SV-RB3G	Shelf,14-Slot,Open Rack	2
SV-PM1C	Processor,Baseband Module,MASTR V	4
SV-CL2N	Cable Assembly RF,RG223,BNC/SMA,5ft	4
SV-AT1B	TERMINATION,50 OHM LOAD	10
SV-NZN8S-DC	Fan Tray,MASTR V, DC	2
SV-ZN9K	PANEL,XCONNECT,MASTR V	2
SV-CL2D	Cable,Xconnect-Baseband Shelf #1	4
SV-CL9V	Kit,Cable,Ch #1,2,9,10,17,18 MASTR V IP	4
SV-MN9S	Panel,Blank,1 RU	2
MASV-NMA6Q	Grounding Shim,28RU	2
SV-CN1B	POWER STRIP,-48VDC LOW PWR DIST,SEISMIC	2
SV-CN7Z	POWER STRIP,-48VDC HIGH PWR DIST,RACK	2
SV-CL2D-DC	Cable,3560v2 Switch, DC Power	2
SV-RB3A	Power Supply Shelf,2nd Position	2
SV-RB3C	Power Supply Shelf	4
SV-CL9W	Kit,Cable,Ch #3,4,11,12,19,20 MASTR V IP	4
MASV-800M1-A	STATION,MASTR V,P25T,800 MHZ,799-817 RX	4
SV-AW5R-A	POWER AMPLIFIER,LINEAR,800 MHZ	6

Part Number	Description	Quantity
	SPARE INTEROPERABILITY GATEWAY	
MANG-GTWY	System Equipment,Interop Gateway	2
MANG-SN5M	SERVICE,QUAD MODE VOCODER LICENSE	24
MANG-NSN6N	License,DVU OTAR	24
MANG-4DVUS	Chassis,4-Slot Interoperability Gateway	2
MANG-NMN2U	Bracket Kit, Interoperability Gateway	2
MANG-NPS2J	Power Supply,AC,4-Slot Gateway Chassis	2
MANG-NAA3E	Module,DVU,UAC,Interoperability Gateway	6
MANG-NCL8S	Cable,Ethernet,6ft	6
MANG-NCA3L	Cable,Audio,4-Slot Chassis GWB,10ft	24
MANG-MN2A	Panel,Filler	2
MANG-NFW2C	SOFTWARE,UAC GWB,AES	2
MANG-NPS2K	Power Supply,DC,4-Slot Gateway Chassis	2
MAMM-200NG	Manual,Instal,4-Slot,Intrperabilty Gtwy	2
	SPARE NETWORK SWITCHING CENTER	
MANS-CP9B	Netclock,GPS Master Clock	1
NS-PNSJ	SERVER, VIDA PREMIER, SR10A.4	1
	SPARE P25 AND CONVENTIONAL SITE EQUIPMENT	
MASA-SVP25	Site Interface Equipment,P25T MASTR V	2
SA-MR1J	RACK,OPEN,84 IN,SEISMIC	2
MASA-NCL7D	Kit,Cable,Ethernet,5ft	2
SA-MD6H	OSCILLATOR, 10MHZ REF,-12VDC,6 PORT	5
SASG9N	Feature,P25 Multisite Support	3
SAMD7Y-DC	KIT, NET SENTRY, CNTL/DATA, DC PWR,WIN10	3
	SPARE SIMULCAST EQUIPMENT	
SC-VTXP25-DC	MASTR V IP Simulcast,Tx Site,Comm Equip	1
SC-MD7B-DC	ASSY,CONTROLLER,SITEPRO,MME W/ CABLES DC	2
	SPARE VIDA NETWORK AND SECURITY	
VSVS01	VS PROD GRP, CONFIGURED MODEL NUMBER	4
VS-CR1G	ROUTER,ISR4221-SEC/K9	5
VS-MN3T	KIT, CISCO 4221 ROUTER, SITE MTG	4
VS-CJ2W	POWER SUPPLY,DC,ISR4221	3
VS-CU5C	SWITCH,CISCO ME 3400E,DC,24-PORT	3
VSMA7B	KIT,MOUNTING HARDWARE, CISCO ME3400	2
VS-CU8A	MODULE,NIM 8PORT LAYER2 GE	2
VS-CN1J	SERVER,UNITRENDS RS606 BACKUP APPLIANCE	1
VS-CR90	ROUTER,ISR4321 WSEC BDL LIC	1
VS-CR72	ROUTER,ISR4331 AX APP &SEC LIC	1
VSCR28	Router,1921,Advanced Security,AC Power	1
VS-CR94	RTR 1921 DATA AC	1
VS-CU6G	MODULE,CISCO EHWIC-4ESG 4-PORT GIG INT	1
VSCU3H	SWITCH,CISCO 2960 PLUS	1
VSMA6N	KIT,MTG HDWR,CISCO 2960 MASTR III/V CAB	1
VS-CR1F	ROUTER,ISR4221/K9	1
VS-CR92	SWITCH,CATALYST 3650 24P IP	1
VS-CU5H	CISCO MODULE,SX MULTIMODE,FIBR	1
VS-CU7Y	MODULE,SFP GBIC	2
VSCR29	Router,1921,Advanced Security,DC Power	1

Part Number	Description	Quantity
	SPARE ANTENNA SYSTEM EQUIPMENT	
E75-4000-007	SURGE SUPPRESSOR,800-2500MHZ BROADBAND	2
DS7A06F36U6D	746-869 MHz 6 dB Gain Omni Fiberglass Antenna with DIN connector	1
DS7A08F36UD	746-869 MHz 8 dB Gain Omni Fiberglass Antenna with DIN connector	1
DS7C10F36U-D	764-869 MHz 10 dB Gain Omni Fiberglass Antenna with DIN connector	1
DS7A06F36U3D	746-869 MHz 6 dB Gain Omni Fiberglass Antenna with DIN connector 3 Degree downtilt	1
DS7C10F36U3D	764-869 MHz 10 dB Gain Omni Fiberglass Antenna with DIN connector 3 Degree downtilt	1
SC479-HF1LDF(E5608)(D02)	COLL OMNI 746-869 MHz 9 DB NULL FILL	1
SC432D-HF6LDF(D00-i40-G06)	SC432 DUAL 746-869 MHZ 6 DBD GN 40	1
SE419-SWBPALDF(D08-E6461_130D	SE419 ENCLOSED DIPOLE, NULL FILL, 130°	1
SC412-HF2LDF(D01-E5608)	SC412 746-869 MHZ 11.5 DBD NUL FILL	1
SC412-HF2LDF(E5608)	SC412 746-869 MHZ 11.5 DBD GN NULL	1
DSCC75-10DS (MISC-MTRL-PO-REF)	763-776 MHz 10 Channel Ceramic Cavity Combiner with SMARTtune Power Monitor DIN output	1
DSCC85-10DS (MISC-MTRL-PO-REF)	851-869 MHz 10 Channel Ceramic Cavity Combiner with SMARTtune Power Monitor DIN Output	1
CP00921	8 Port Receiver Multicoupler	1
CP00921, CP11151	16 Port Receiver Multicoupler	1
CP00921, CP11151, CP01102	24 Port Receiver Multicoupler	1
CP00732	Tower Top Amplifier	1

TABLE B.1 - TOTAL NSRS PRICE SUMMARY

TABLE B.1 provides a summary of the Total Base Proposal Price broken down by NDOT (Table B.1.A), NV Energy (Table B.1.B) and Washoe County (Table B.1.C) equipment and services. Please see NSRS RFP Pricing Instructions for filling out this pricing spreadsheet.

TABLE B.1.C - WASHOE COUNTY TOTAL PRICE SUMMARY

System Equipment	Discounted Price
System Control Equipment, Software, and Licensing	$ 1,698,545.77
Network Monitoring and Fault Management Equipment, Software, and Licensing	$ 139,860.00
Radio System Equipment, Software, and Licensing	$ 3,671,232.87
Antenna Systems	$ 341,811.20
Networking Equipment, Software, and Licensing	$ 671,875.45
Spare Equipment	$ 701,290.47
TOTAL EQUIPMENT PRICE	**$ 7,224,615.76**
Deployment Services	
System Equipment Services	$ 612,310.05
System Engineering	$ 754,293.00
Migration Services	$ -
Project Management	$ 331,647.00
System Training	$ 247,599.19
Performance Bond	Included
TOTAL SERVICES PRICE	**$ 1,945,849.24**
WASHOE BASE PRICE RF Infrastructure and Services	**$ 9,170,465.00**
Additional Discount - Infrastructure (over 26% NASPO Discount)	**$ (4,592,982.28)**
WASHOE DISCOUNTED BASE PRICE	**$ 4,577,482.72**
WASHOE COUNTY GREENFIELD SITES PRICE - Table B.11 (without Civils and Microwave)	**$ 2,675,477.68**
Microwave Equipment, Software, and Licensing	**$ 2,236,645.70**
WASHOE COUNTY DISPATCH EQUIPMENT AND SERVICES (without Microwave)	**$ 583,647.53**
WASHOE COUNTY SUBSCRIBER EQUIPMENT AND SERVICES	**$ 10,960,587.35**
WASHOE EXTENDED WARRANTY SUPPPORT	**$ 707,092.00**
TOTAL WASHOE COUNTY SYSTEM BASE CONTRACT PRICE	**$ 21,740,932.98**
Site Infrastructure - ALLOWANCE (Civils)	$ 4,474,529.70
Site Development - ALLOWANCE (Civils)	$ 322,048.00
TOTAL WASHOE COUNTY SYSTEM CIVILS ALLOWANCE	**$ 4,796,577.70**
TOTAL WASHOE SYSTEM CONTRACT PRICE without Maintenance	**$ 26,537,510.68**

PRICES DO NOT INCLUDE ANY SALES TAXES

TABLE B.8 - WASHOE COUNTY SYSTEM INFRASTRUCTURE PRICES		
	ALL SITES TOTAL	
Site Description --->		
Subsystem Category	Equipment Discounted	
System Control Equipment, Software, and Licensing	Items highlighted in yellow are changes from RFP submission.	
Secondary NSC Premier Server with SW & Lics	$	212,789.96
Primary VIDA Connect Core with SW & Lics	$	731,966.56
Distributed Control Point Licenses	$	333,000.00
ISSI Gateway and Licenses	$	-
Asset Manager - CommSHOP 360	$	62,877.00
Logging Recorder - WCSD (OPTIONAL)	$	-
Logging Recorder - WC	$	357,912.25
	$	-
	$	-
SUBTOTAL	**$**	**1,698,545.77**
Network Monitoring and Fault Management Equipment, Software, and Licensing		
Network Sentry - Multisite	$	31,080.00
Network Sentry - Simulcast Site	$	93,240.00
Network Sentry - Transportable Site	$	15,540.00
2	$	-
6	$	-
SUBTOTAL	**$**	**139,860.00**
Radio System Equipment, Software and Licensing		
Site Interface Equipment	$	451,574.27
MASTR V P25 Trunked Base Station	$	2,969,960.40
84" Open Rack (Seismic)	$	105,754.88
Site Interface Equipment - Conventional	$	19,050.56
TB9435 Conventional Repeater	$	124,892.76
	$	-
	$	-
SUBTOTAL	**$**	**3,671,232.87**

TABLE B.8 - WASHOE COUNTY SYSTEM INFRASTRUCTURE PRICES		
	ALL SITES TOTAL	
Site Description --->		
Subsystem Category	Equipment Discounted	
Antenna Systems		
P25 Combiner - 4 channel	$	4,912.50
P25 Combiner - 6 channel	$	20,700.00
P25 Combiner - 8 channel	$	19,762.50
P25 Combiner - 10 channel	$	76,125.00
P25 Multicoupler - 8 Port	$	3,797.50
P25 Multicoupler - 16 Port	$	13,935.00
Tower Top Amplifier	$	18,712.50
P25 Cables, Connectors, Filters	$	64,293.08
P25 Antennas	$	55,259.13
Conventional Combiner - 800MHz	$	6,900.00
Conventional Combiner - VHF	$	11,088.00
Conventional Multicoupler	$	-
Conventional Antenna - 800 MHz	$	2,937.50
Conventional Antenna - VHF	$	3,750.00
Conventional Cables, Connectors, Filters	$	18,081.00
P25 Multicoupler - 24 Port	$	5,770.00
P25 Combiner - 7 channel	$	15,787.50
P25 Combiner - 5 channel	$	-
SUBTOTAL	**$**	**341,811.20**
Networking Equipment, Software, and Licensing		
Interop Gateway w/24 talkpaths	$	-
Interop Gateway w/30 talkpaths	$	-
Cisco Switch DC 24-Port	$	39,754.65
UPS	$	5,625.00
Integrated Trailer	$	97,547.50
84" Open Rack (Seismic)	$	36,467.20
Interop Gateway w/8 talkpaths	$	492,481.10
SUBTOTAL	**$**	**671,875.45**
Site Infrastructure		
Tower, with Foundation & Construction	$	385,901.28
Shelter, with Foundation & Construction	$	619,192.47
Site Development - Roads, Fencing, Land Clearing	$	164,340.00
Generator, 40KW with Foundation and LP Tank	$	123,075.00
Electrical Work	$	70,290.00
DC Power	$	180,757.39
AC Unit	$	-
Permits, Drawings, Site Acq, Tower Analysis	$	160,380.00
	$	-
SUBTOTAL (ALLOWANCE)	**$**	**1,703,936.14**
Microwave Equipment, Software, and Licensing		
Microwave Hop	$	1,495,050.77
Optional Site On Wheels MW Equip	$	-
	$	-
SUBTOTAL	**$**	**1,495,050.77**
TOTAL EQUIPMENT PRICE	**$**	**9,722,312.20**

TABLE B.8 - WASHOE COUNTY SYSTEM INFRASTR					
	Site --->	1	NOC		
Site Description --->			Secondary VIDA HA Switching Center		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Secondary NSC Premier Server with SW & Lics	$ 287,554.00	1	$ 287,554.00	26.00%	$ 212,789.96
Primary VIDA Connect Core with SW & Lics	$ 989,144.00	1	$ 989,144.00	26.00%	$ 731,966.56
Distributed Control Point Licenses	$ 75,000.00	6	$ 450,000.00	26.00%	$ 333,000.00
ISSI Gateway and Licenses	$ 1,425,000.00	0	$ -	26.00%	$ -
Asset Manager - CommSHOP 360	$ 62,877.00	1	$ 62,877.00	0.00%	$ 62,877.00
Logging Recorder - WCSD (OPTIONAL)	$ 249,143.00	0	$ -		$ -
Logging Recorder - WC	$ 357,912.25	1	$ 357,912.25		$ 357,912.25
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 1,698,545.77**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite			$ -		$ -
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
2			$ -		$ -
6			$ -		$ -
SUBTOTAL					**$ -**
Radio System Equipment, Software and Licensing					
Site Interface Equipment			$ -		$ -
MASTR V P25 Trunked Base Station			$ -		$ -
84" Open Rack (Seismic)			$ -		$ -
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**

TABLE B.8 - WASHOE COUNTY SYSTEM INFRASTR					
	Site --->	1	NOC		
Site Description --->			Secondary VIDA HA Switching Center		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel			$ -		$ -
P25 Combiner - 6 channel			$ -		$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port			$ -		$ -
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier			$ -		$ -
P25 Cables, Connectors, Filters			$ -		$ -
P25 Antennas			$ -		$ -
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF			$ -		$ -
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF			$ -		$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Multicoupler - 24 Port			$ -		$ -
P25 Combiner - 7 channel					
P25 Combiner - 5 channel			$ -		$ -
SUBTOTAL					**$ -**
Networking Equipment, Software, and Licensing					
Interop Gateway w/24 talkpaths	$ 184,200.00	0	$ -	26.00%	$ -
Interop Gateway w/30 talkpaths	$ 199,523.00	0	$ -	26.00%	$ -
Cisco Switch DC 24-Port			$ -		$ -
UPS			$ -		$ -
Integrated Trailer			$ -		$ -
84" Open Rack (Seismic)			$ -		$ -
Interop Gateway w/8 talkpaths			$ -		$ -
SUBTOTAL					**$ -**
Site Infrastructure					
Tower, with Foundation & Construction			$ -		$ -
Shelter, with Foundation & Construction			$ -		$ -
Site Development - Roads, Fencing, Land Clearing			$ -		$ -
Generator, 40KW with Foundation and LP Tank			$ -		$ -
Electrical Work			$ -		$ -
DC Power			$ -		$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acq, Tower Analysis			$ -		$ -
			$ -		$ -
SUBTOTAL (ALLOWANCE)					**$ -**
Microwave Equipment, Software, and Licensing					
Microwave Hop	$ 79,488.07	1	$ 79,488.07	0.00%	$ 79,488.07
Optional Site On Wheels MW Equip			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 79,488.07**
TOTAL EQUIPMENT PRICE					**$ 1,778,033.84**

TABLE B.8 - WASHOE COUNTY SYSTEM INFRASTR					
	Site --->	2	Edison		
Site Description --->			Secondary VIDA HA Switching Center		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Secondary NSC Premier Server with SW & Lics	$ 237,211.00	0	$ -	26.00%	$ -
Primary VIDA Connect Core with SW & Lics	$ 50,000.00	0	$ -	26.00%	$ -
Distributed Control Point Licenses	$ 50,000.00	0	$ -	26.00%	$ -
ISSI Gateway and Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
Logging Recorder - WCSD (OPTIONAL)			$ -		$ -
Logging Recorder - WC			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite			$ -		$ -
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
2			$ -		$ -
6			$ -		$ -
SUBTOTAL					**$ -**
Radio System Equipment, Software and Licensing					
Site Interface Equipment			$ -		$ -
MASTR V P25 Trunked Base Station			$ -		$ -
84" Open Rack (Seismic)			$ -		$ -
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**

TABLE B.8 - WASHOE COUNTY SYSTEM INFRASTR					
	Site --->	2	Edison		
Site Description --->			Secondary VIDA HA Switching Center		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel			$ -		$ -
P25 Combiner - 6 channel			$ -		$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port			$ -		$ -
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier			$ -		$ -
P25 Cables, Connectors, Filters			$ -		$ -
P25 Antennas			$ -		$ -
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF			$ -		$ -
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF			$ -		$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Multicoupler - 24 Port			$ -		$ -
P25 Combiner - 7 channel					
P25 Combiner - 5 channel			$ -		$ -
SUBTOTAL					**$ -**
Networking Equipment, Software, and Licensing					
Interop Gateway w/24 talkpaths			$ -		$ -
Interop Gateway w/30 talkpaths			$ -		$ -
Cisco Switch DC 24-Port			$ -		$ -
UPS			$ -		$ -
Integrated Trailer			$ -		$ -
84" Open Rack (Seismic)			$ -		$ -
Interop Gateway w/8 talkpaths			$ -		$ -
SUBTOTAL					**$ -**
Site Infrastructure					
Tower, with Foundation & Construction			$ -		$ -
Shelter, with Foundation & Construction			$ -		$ -
Site Development - Roads, Fencing, Land Clearing			$ -		$ -
Generator, 40KW with Foundation and LP Tank			$ -		$ -
Electrical Work			$ -		$ -
DC Power			$ -		$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acq, Tower Analysis			$ -		$ -
			$ -		$ -
SUBTOTAL (ALLOWANCE)					**$ -**
Microwave Equipment, Software, and Licensing					
Microwave Hop			$ -		$ -
Optional Site On Wheels MW Equip			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ -**

TABLE B.8 - WASHOE COUNTY SYSTEM INFRASTF					
	Site --->	3	Biltmore-Tahoe		
Site Description --->			8 Channel Simulcast (DCP)		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Secondary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
ISSI Gateway and Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
Logging Recorder - WCSD (OPTIONAL)			$ -		$ -
Logging Recorder - WC			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite			$ -		$ -
Network Sentry - Simulcast Site	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Transportable Site			$ -		$ -
2			$ -		$ -
6			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment	$ 78,605.50	1	$ 78,605.50	26.00%	$ 58,168.07
MASTR V P25 Trunked Base Station	$ 40,540.00	8	$ 324,320.00	26.00%	$ 239,996.80
84" Open Rack (Seismic)	$ 4,928.00	2	$ 9,856.00	26.00%	$ 7,293.44
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 305,458.31**

TABLE B.8 - WASHOE COUNTY SYSTEM INFRASTR					
	Site --->	3	Biltmore-Tahoe		
Site Description --->			8 Channel Simulcast (DCP)		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel			$ -		$ -
P25 Combiner - 6 channel			$ -		$ -
P25 Combiner - 8 channel	$ 8,887.50	1	$ 8,887.50	0.00%	$ 8,887.50
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75	0.00%	$ 1,898.75
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 7,467.00	1	$ 7,467.00	10.00%	$ 6,720.30
P25 Antennas	$ 2,494.00	1	$ 2,494.00	0.00%	$ 2,494.00
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF			$ -		$ -
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF			$ -		$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Multicoupler - 24 Port			$ -		$ -
P25 Combiner - 7 channel					
P25 Combiner - 5 channel			$ -		$ -
SUBTOTAL					**$ 21,871.80**
Networking Equipment, Software, and Licensing					
Interop Gateway w/24 talkpaths			$ -		$ -
Interop Gateway w/30 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
UPS			$ -		$ -
Integrated Trailer			$ -		$ -
84" Open Rack (Seismic)	$ 4,928.00	1	$ 4,928.00	26.00%	$ 3,646.72
Interop Gateway w/8 talkpaths	$ 66,551.50	1	$ 66,551.50	26.00%	$ 49,248.11
SUBTOTAL					**$ 56,870.30**
Site Infrastructure					
Tower, with Foundation & Construction			$ -	0.00%	$ -
Shelter, with Foundation & Construction			$ -	0.00%	$ -
Site Development - Roads, Fencing, Land Clearing			$ -	0.00%	$ -
Generator, 40KW with Foundation and LP Tank			$ -	0.00%	$ -
Electrical Work	$ 1,980.00	1	$ 1,980.00	0.00%	$ 1,980.00
DC Power			$ -	0.00%	$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acq, Tower Analysis	$ 3,960.00	1	$ 3,960.00	0.00%	$ 3,960.00
			$ -		$ -
SUBTOTAL (ALLOWANCE)					**$ 5,940.00**
Microwave Equipment, Software, and Licensing					
Microwave Hop	$ 96,128.32	1	$ 96,128.32	0.00%	$ 96,128.32
Optional Site On Wheels MW Equip			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 96,128.32**
TOTAL EQUIPMENT PRICE					**$ 501,808.73**

TABLE B.8 - WASHOE COUNTY SYSTEM INFRASTR					
	Site --->	4	Snowflake Lodge - Tahoe		
Site Description --->			8 Channel Simulcast (DCP)		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Secondary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
ISSI Gateway and Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
Logging Recorder - WCSD (OPTIONAL)			$ -		$ -
Logging Recorder - WC			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite			$ -		$ -
Network Sentry - Simulcast Site	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Transportable Site			$ -		$ -
2			$ -		$ -
6			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment	$ 78,605.50	1	$ 78,605.50	26.00%	$ 58,168.07
MASTR V P25 Trunked Base Station	$ 40,540.00	8	$ 324,320.00	26.00%	$ 239,996.80
84" Open Rack (Seismic)	$ 4,928.00	2	$ 9,856.00	26.00%	$ 7,293.44
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 305,458.31**

TABLE B.8 - WASHOE COUNTY SYSTEM INFRASTR					
	Site --->	4	Snowflake Lodge - Tahoe		
Site Description --->			8 Channel Simulcast (DCP)		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel			$ -		$ -
P25 Combiner - 6 channel			$ -		$ -
P25 Combiner - 8 channel	$ 10,875.00	1	$ 10,875.00	0.00%	$ 10,875.00
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	0	$ -	0.00%	$ -
P25 Multicoupler - 16 Port	$ 2,322.50	1	$ 2,322.50	0.00%	$ 2,322.50
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 7,467.00	1	$ 7,467.00	10.00%	$ 6,720.30
P25 Antennas	$ 2,494.00	1	$ 2,494.00	0.00%	$ 2,494.00
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF			$ -		$ -
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF			$ -		$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Multicoupler - 24 Port			$ -		$ -
P25 Combiner - 7 channel					
P25 Combiner - 5 channel			$ -		$ -
SUBTOTAL					**$ 24,283.05**
Networking Equipment, Software, and Licensing					
Interop Gateway w/24 talkpaths			$ -		$ -
Interop Gateway w/30 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
UPS			$ -		$ -
Integrated Trailer			$ -		$ -
84" Open Rack (Seismic)	$ 4,928.00	1	$ 4,928.00	26.00%	$ 3,646.72
Interop Gateway w/8 talkpaths	$ 66,551.50	1	$ 66,551.50	26.00%	$ 49,248.11
SUBTOTAL					**$ 56,870.30**
Site Infrastructure					
Tower, with Foundation & Construction			$ -	0.00%	$ -
Shelter, with Foundation & Construction			$ -	0.00%	$ -
Site Development - Roads, Fencing, Land Clearing			$ -	0.00%	$ -
Generator, 40KW with Foundation and LP Tank			$ -	0.00%	$ -
Electrical Work	$ 1,980.00	1	$ 1,980.00	0.00%	$ 1,980.00
DC Power			$ -	0.00%	$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acq, Tower Analysis	$ 3,960.00	1	$ 3,960.00	0.00%	$ 3,960.00
			$ -		$ -
SUBTOTAL (ALLOWANCE)					**$ 5,940.00**
Microwave Equipment, Software, and Licensing					
Microwave Hop	$ 65,775.26	1	$ 65,775.26	0.00%	$ 65,775.26
Optional Site On Wheels MW Equip			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 65,775.26**
TOTAL EQUIPMENT PRICE					**$ 473,866.92**

TABLE B.8 - WASHOE COUNTY SYSTEM INFRASTF					
	Site --->	5	Slide Mountain		
Site Description --->			12 Channel Simulcast (Was 14) (DCP)		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Secondary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
ISSI Gateway and Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
Logging Recorder - WCSD (OPTIONAL)			$ -		$ -
Logging Recorder - WC			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite			$ -		$ -
Network Sentry - Simulcast Site	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Transportable Site			$ -		$ -
2			$ -		$ -
6			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment	$ 83,977.75	1	$ 83,977.75	26.00%	$ 62,143.54
MASTR V P25 Trunked Base Station	$ 40,540.00	12	$ 486,480.00	26.00%	$ 359,995.20
84" Open Rack (Seismic)	$ 4,928.00	3	$ 14,784.00	26.00%	$ 10,940.16
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 433,078.90**

TABLE B.8 - WASHOE COUNTY SYSTEM INFRASTR					
	Site --->	5	Slide Mountain		
Site Description --->			12 Channel Simulcast (Was 14) (DCP)		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel			$ -		$ -
P25 Combiner - 6 channel	$ 6,900.00	2	$ 13,800.00	0.00%	$ 13,800.00
P25 Combiner - 8 channel	$ 10,046.25	0	$ -	0.00%	$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port			$ -		$ -
P25 Multicoupler - 16 Port	$ 2,322.50	1	$ 2,322.50	0.00%	$ 2,322.50
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 11,536.00	1	$ 11,536.00	10.00%	$ 10,382.40
P25 Antennas	$ 2,141.25	3	$ 6,423.75	0.00%	$ 6,423.75
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF			$ -		$ -
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF			$ -		$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Multicoupler - 24 Port			$ -		$ -
P25 Combiner - 7 channel					
P25 Combiner - 5 channel			$ -		$ -
SUBTOTAL					**$ 34,799.90**
Networking Equipment, Software, and Licensing					
Interop Gateway w/24 talkpaths			$ -		$ -
Interop Gateway w/30 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
UPS			$ -		$ -
Integrated Trailer			$ -		$ -
84" Open Rack (Seismic)	$ 4,928.00	1	$ 4,928.00	26.00%	$ 3,646.72
Interop Gateway w/8 talkpaths	$ 66,551.50	1	$ 66,551.50	26.00%	$ 49,248.11
SUBTOTAL					**$ 56,870.30**
Site Infrastructure					
Tower, with Foundation & Construction			$ -	0.00%	$ -
Shelter, with Foundation & Construction			$ -	0.00%	$ -
Site Development - Roads, Fencing, Land Clearing			$ -	0.00%	$ -
Generator, 40KW with Foundation and LP Tank			$ -	0.00%	$ -
Electrical Work	$ 1,980.00	1	$ 1,980.00	0.00%	$ 1,980.00
DC Power			$ -	0.00%	$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acq, Tower Analysis	$ 3,960.00	1	$ 3,960.00	0.00%	$ 3,960.00
			$ -		$ -
SUBTOTAL (ALLOWANCE)					**$ 5,940.00**
Microwave Equipment, Software, and Licensing					
Microwave Hop	$ 164,232.58	1	$ 164,232.58	0.00%	$ 164,232.58
Optional Site On Wheels MW Equip			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 164,232.58**
TOTAL EQUIPMENT PRICE					**$ 710,461.67**

TABLE B.8 - WASHOE COUNTY SYSTEM INFRASTF					
	Site --->	6	Mount Rose		
Site Description --->			12 Channel Simulcast (Was 14) (DCP)		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Secondary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
ISSI Gateway and Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
Logging Recorder - WCSD (OPTIONAL)			$ -		$ -
Logging Recorder - WC			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite			$ -		$ -
Network Sentry - Simulcast Site	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Transportable Site			$ -		$ -
2			$ -		$ -
6			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment	$ 83,977.75	1	$ 83,977.75	26.00%	$ 62,143.54
MASTR V P25 Trunked Base Station	$ 40,540.00	12	$ 486,480.00	26.00%	$ 359,995.20
84" Open Rack (Seismic)	$ 4,928.00	3	$ 14,784.00	26.00%	$ 10,940.16
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 433,078.90**

TABLE B.8 - WASHOE COUNTY SYSTEM INFRASTR					
	Site --->	6	Mount Rose		
Site Description --->			12 Channel Simulcast (Was 14) (DCP)		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel			$ -		$ -
P25 Combiner - 6 channel			$ -	0.00%	$ -
P25 Combiner - 8 channel	$ 10,046.25	0	$ -	0.00%	$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port			$ -		$ -
P25 Multicoupler - 16 Port	$ 2,322.50	1	$ 2,322.50	0.00%	$ 2,322.50
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 11,536.00	1	$ 11,536.00	10.00%	$ 10,382.40
P25 Antennas	$ 2,141.25	3	$ 6,423.75	10.00%	$ 5,781.38
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF			$ -		$ -
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF			$ -		$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Multicoupler - 24 Port			$ -		$ -
P25 Combiner - 7 channel	$ 7,893.75	2	$ 15,787.50		$ 15,787.50
P25 Combiner - 5 channel			$ -		$ -
SUBTOTAL					**$ 36,145.03**
Networking Equipment, Software, and Licensing					
Interop Gateway w/24 talkpaths			$ -		$ -
Interop Gateway w/30 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
UPS			$ -		$ -
Integrated Trailer			$ -		$ -
84" Open Rack (Seismic)	$ 4,928.00	1	$ 4,928.00	26.00%	$ 3,646.72
Interop Gateway w/8 talkpaths	$ 66,551.50	1	$ 66,551.50	26.00%	$ 49,248.11
SUBTOTAL					**$ 56,870.30**
Site Infrastructure					
Tower, with Foundation & Construction			$ -	0.00%	$ -
Shelter, with Foundation & Construction			$ -	0.00%	$ -
Site Development - Roads, Fencing, Land Clearing			$ -	0.00%	$ -
Generator, 40KW with Foundation and LP Tank			$ -	0.00%	$ -
Electrical Work	$ 1,980.00	1	$ 1,980.00	0.00%	$ 1,980.00
DC Power			$ -	0.00%	$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acq, Tower Analysis	$ 3,960.00	1	$ 3,960.00	0.00%	$ 3,960.00
			$ -		$ -
SUBTOTAL (ALLOWANCE)					**$ 5,940.00**
Microwave Equipment, Software, and Licensing					
Microwave Hop	$ 72,034.87	1	$ 72,034.87	0.00%	$ 72,034.87
Optional Site On Wheels MW Equip			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 72,034.87**
TOTAL EQUIPMENT PRICE					**$ 619,609.09**

TABLE B.8 - WASHOE COUNTY SYSTEM INFRASTF					
	Site --->	7	Red Peak - Metro		
Site Description --->			16 Channel Simulcast (Re-using Some RF Equip)		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Secondary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
ISSI Gateway and Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
Logging Recorder - WCSD (OPTIONAL)			$ -		$ -
Logging Recorder - WC			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite			$ -		$ -
Network Sentry - Simulcast Site	$ 15,000.00	0	$ -	26.00%	$ -
Network Sentry - Transportable Site			$ -		$ -
2			$ -		$ -
6			$ -		$ -
SUBTOTAL					**$ -**
Radio System Equipment, Software and Licensing					
Site Interface Equipment	$ 62,254.00	0	$ -	26.00%	$ -
MASTR V P25 Trunked Base Station	$ 40,540.00	12	$ 486,480.00	26.00%	$ 359,995.20
84" Open Rack (Seismic)	$ 4,928.00	3	$ 14,784.00	26.00%	$ 10,940.16
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 370,935.36**

TABLE B.8 - WASHOE COUNTY SYSTEM INFRASTR					
	Site --->	7	Red Peak - Metro		
Site Description --->			16 Channel Simulcast (Re-using Some RF Equip)		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel			$ -		$ -
P25 Combiner - 6 channel			$ -		$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel	$ 10,875.00	2	$ 21,750.00	0.00%	$ 21,750.00
P25 Multicoupler - 8 Port			$ -		$ -
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 3,620.00	1	$ 3,620.00	10.00%	$ 3,258.00
P25 Antennas	$ 1,768.00	3	$ 5,304.00	0.00%	$ 5,304.00
Conventional Combiner - 800MHz					
Conventional Combiner - VHF					
Conventional Multicoupler					
Conventional Antenna - 800 MHz					
Conventional Antenna - VHF					
Conventional Cables, Connectors, Filters					
P25 Multicoupler - 24 Port	$ 2,885.00	1	$ 2,885.00	0.00%	$ 2,885.00
P25 Combiner - 7 channel					
P25 Combiner - 5 channel			$ -		$ -
SUBTOTAL					**$ 35,068.25**
Networking Equipment, Software, and Licensing					
Interop Gateway w/24 talkpaths			$ -		$ -
Interop Gateway w/30 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
UPS			$ -		$ -
Integrated Trailer			$ -		$ -
84" Open Rack (Seismic)	$ 4,928.00	1	$ 4,928.00	26.00%	$ 3,646.72
Interop Gateway w/8 talkpaths	$ 66,551.50	1	$ 66,551.50	26.00%	$ 49,248.11
SUBTOTAL					**$ 56,870.30**
Site Infrastructure					
Tower, with Foundation & Construction	$ 128,633.76	1	$ 128,633.76	0.00%	$ 128,633.76
Shelter, with Foundation & Construction	$ 206,397.49	1	$ 206,397.49	0.00%	$ 206,397.49
Site Development - Roads, Fencing, Land Clearing	$ 54,780.00	1	$ 54,780.00	0.00%	$ 54,780.00
Generator, 40KW with Foundation and LP Tank	$ 41,025.00	1	$ 41,025.00	0.00%	$ 41,025.00
Electrical Work	$ 18,810.00	1	$ 18,810.00	0.00%	$ 18,810.00
DC Power	$ 60,252.46	1	$ 60,252.46	0.00%	$ 60,252.46
AC Unit			$ -		$ -
Permits, Drawings, Site Acq, Tower Analysis	$ 44,220.00	1	$ 44,220.00	0.00%	$ 44,220.00
			$ -		$ -
SUBTOTAL (ALLOWANCE)					**$ 554,118.71**
Microwave Equipment, Software, and Licensing					
Microwave Hop	$ 137,675.55	1	$ 137,675.55	0.00%	$ 137,675.55
Optional Site On Wheels MW Equip			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 137,675.55**
TOTAL EQUIPMENT PRICE					**$ 1,154,668.17**

TABLE B.8 - WASHOE COUNTY SYSTEM INFRASTR					
	Site --->	8	Peavine Ridge - Metro (NCRN)		
Site Description --->			16 Channel Simulcast (Re-using Some RF Equip)		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Secondary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
ISSI Gateway and Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
Logging Recorder - WCSD (OPTIONAL)			$ -		$ -
Logging Recorder - WC			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite			$ -		$ -
Network Sentry - Simulcast Site	$ 15,000.00	0	$ -	26.00%	$ -
Network Sentry - Transportable Site			$ -		$ -
2			$ -		$ -
6			$ -		$ -
SUBTOTAL					**$ -**
Radio System Equipment, Software and Licensing					
Site Interface Equipment	$ 62,254.00	0	$ -	26.00%	$ -
MASTR V P25 Trunked Base Station	$ 40,540.00	12	$ 486,480.00	26.00%	$ 359,995.20
84" Open Rack (Seismic)	$ 4,928.00	3	$ 14,784.00	26.00%	$ 10,940.16
Site Interface Equipment - Conventional	$ 12,872.00	1	$ 12,872.00	26.00%	$ 9,525.28
TB9435 Conventional Repeater	$ 14,064.50	6	$ 84,387.00	26.00%	$ 62,446.38
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 442,907.02**

TABLE B.8 - WASHOE COUNTY SYSTEM INFRASTR					
	Site --->	8	Peavine Ridge - Metro (NCRN)		
Site Description --->			16 Channel Simulcast (Re-using Some RF Equip)		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel			$ -		$ -
P25 Combiner - 6 channel			$ -		$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel	$ 10,875.00	2	$ 21,750.00	0.00%	$ 21,750.00
P25 Multicoupler - 8 Port			$ -		$ -
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 3,620.00	1	$ 3,620.00	10.00%	$ 3,258.00
P25 Antennas	$ 3,255.00	3	$ 9,765.00	0.00%	$ 9,765.00
Conventional Combiner - 800MHz	$ 6,900.00	1	$ 6,900.00	0.00%	$ 6,900.00
Conventional Combiner - VHF					$ -
Conventional Multicoupler					$ -
Conventional Antenna - 800 MHz	$ 2,937.50	1	$ 2,937.50	0.00%	$ 2,937.50
Conventional Antenna - VHF			$ -	0.00%	$ -
Conventional Cables, Connectors, Filters	$ 10,045.00	1	$ 10,045.00	10.00%	$ 9,040.50
P25 Multicoupler - 24 Port	$ 2,885.00	1	$ 2,885.00	0.00%	$ 2,885.00
P25 Combiner - 7 channel					
P25 Combiner - 5 channel			$ -		$ -
SUBTOTAL					**$ 58,407.25**
Networking Equipment, Software, and Licensing					
Interop Gateway w/24 talkpaths			$ -		$ -
Interop Gateway w/30 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
UPS			$ -		$ -
Integrated Trailer			$ -		$ -
84" Open Rack (Seismic)	$ 4,928.00	1	$ 4,928.00	26.00%	$ 3,646.72
Interop Gateway w/8 talkpaths	$ 66,551.50	1	$ 66,551.50	26.00%	$ 49,248.11
SUBTOTAL					**$ 56,870.30**
Site Infrastructure					
Tower, with Foundation & Construction	$ 128,633.76	1	$ 128,633.76	0.00%	$ 128,633.76
Shelter, with Foundation & Construction	$ 206,397.49	1	$ 206,397.49	0.00%	$ 206,397.49
Site Development - Roads, Fencing, Land Clearing	$ 54,780.00	1	$ 54,780.00	0.00%	$ 54,780.00
Generator, 40KW with Foundation and LP Tank	$ 41,025.00	1	$ 41,025.00	0.00%	$ 41,025.00
Electrical Work	$ 18,810.00	1	$ 18,810.00	0.00%	$ 18,810.00
DC Power	$ 60,252.46	1	$ 60,252.46	0.00%	$ 60,252.46
AC Unit			$ -		$ -
Permits, Drawings, Site Acq, Tower Analysis	$ 44,220.00	1	$ 44,220.00	0.00%	$ 44,220.00
			$ -		$ -
SUBTOTAL (ALLOWANCE)					**$ 554,118.71**
Microwave Equipment, Software, and Licensing					
Microwave Hop	$ 194,626.08	1	$ 194,626.08	0.00%	$ 194,626.08
Optional Site On Wheels MW Equip			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 194,626.08**
TOTAL EQUIPMENT PRICE					**$ 1,306,929.36**

TABLE B.8 - WASHOE COUNTY SYSTEM INFRASTF					
	Site --->	9	Virginia Peak		
Site Description --->			10 Channel Multisite (Was 12) (DCP)		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Secondary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
ISSI Gateway and Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
Logging Recorder - WCSD (OPTIONAL)			$ -		$ -
Logging Recorder - WC			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite			$ -		$ -
Network Sentry - Simulcast Site	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Transportable Site			$ -		$ -
2			$ -		$ -
6			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment	$ 83,977.75	1	$ 83,977.75	26.00%	$ 62,143.54
MASTR V P25 Trunked Base Station	$ 40,540.00	10	$ 405,400.00	26.00%	$ 299,996.00
84" Open Rack (Seismic)	$ 4,928.00	3	$ 14,784.00	26.00%	$ 10,940.16
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 373,079.70**

TABLE B.8 - WASHOE COUNTY SYSTEM INFRASTR					
	Site --->	9	Virginia Peak		
Site Description --->			10 Channel Multisite (Was 12) (DCP)		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel			$ -		$ -
P25 Combiner - 6 channel	$ 8,287.50	0	$ -	0.00%	$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel	$ 10,875.00	1	$ 10,875.00	0.00%	$ 10,875.00
P25 Multicoupler - 8 Port			$ -		$ -
P25 Multicoupler - 16 Port	$ 2,322.50	1	$ 2,322.50	0.00%	$ 2,322.50
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 7,691.50	1	$ 7,691.50	10.00%	$ 6,922.35
P25 Antennas	$ 1,670.50	2	$ 3,341.00	0.00%	$ 3,341.00
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF			$ -		$ -
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF			$ -		$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Multicoupler - 24 Port			$ -		$ -
P25 Combiner - 7 channel					
P25 Combiner - 5 channel			$ -		$ -
SUBTOTAL					**$ 25,332.10**
Networking Equipment, Software, and Licensing					
Interop Gateway w/24 talkpaths			$ -		$ -
Interop Gateway w/30 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
UPS			$ -		$ -
Integrated Trailer			$ -		$ -
84" Open Rack (Seismic)	$ 4,928.00	1	$ 4,928.00	26.00%	$ 3,646.72
Interop Gateway w/8 talkpaths	$ 66,551.50	1	$ 66,551.50	26.00%	$ 49,248.11
SUBTOTAL					**$ 56,870.30**
Site Infrastructure					
Tower, with Foundation & Construction			$ -	0.00%	$ -
Shelter, with Foundation & Construction			$ -	0.00%	$ -
Site Development - Roads, Fencing, Land Clearing			$ -	0.00%	$ -
Generator, 40KW with Foundation and LP Tank			$ -	0.00%	$ -
Electrical Work	$ 1,980.00	1	$ 1,980.00	0.00%	$ 1,980.00
DC Power			$ -	0.00%	$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acq, Tower Analysis	$ 3,960.00	1	$ 3,960.00	0.00%	$ 3,960.00
			$ -		$ -
SUBTOTAL (ALLOWANCE)					**$ 5,940.00**
Microwave Equipment, Software, and Licensing					
Microwave Hop	$ 244,917.64	1	$ 244,917.64	0.00%	$ 244,917.64
Optional Site On Wheels MW Equip			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 244,917.64**
TOTAL EQUIPMENT PRICE					**$ 721,679.73**

TABLE B.8 - WASHOE COUNTY SYSTEM INFRASTF					
	Site --->	10	Marble Bluff		
Site Description --->			10 Channel Multisite (Was 12) (DCP)		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Secondary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
ISSI Gateway and Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
Logging Recorder - WCSD (OPTIONAL)			$ -		$ -
Logging Recorder - WC			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite			$ -		$ -
Network Sentry - Simulcast Site	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Transportable Site			$ -		$ -
2			$ -		$ -
6			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment	$ 83,977.75	1	$ 83,977.75	26.00%	$ 62,143.54
MASTR V P25 Trunked Base Station	$ 40,540.00	10	$ 405,400.00	26.00%	$ 299,996.00
84" Open Rack (Seismic)	$ 4,928.00	3	$ 14,784.00	26.00%	$ 10,940.16
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 373,079.70**

TABLE B.8 - WASHOE COUNTY SYSTEM INFRASTF					
	Site --->	10	Marble Bluff		
Site Description --->			10 Channel Multisite (Was 12) (DCP)		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel			$ -		$ -
P25 Combiner - 6 channel	$ 8,287.50	0	$ -	0.00%	$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel	$ 10,875.00	1	$ 10,875.00	0.00%	$ 10,875.00
P25 Multicoupler - 8 Port			$ -		$ -
P25 Multicoupler - 16 Port	$ 2,322.50	1	$ 2,322.50	0.00%	$ 2,322.50
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 7,691.50	1	$ 7,691.50	10.00%	$ 6,922.35
P25 Antennas	$ 1,798.25	2	$ 3,596.50	0.00%	$ 3,596.50
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF			$ -		$ -
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF			$ -		$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Multicoupler - 24 Port			$ -		$ -
P25 Combiner - 7 channel					
P25 Combiner - 5 channel			$ -		$ -
SUBTOTAL					**$ 25,587.60**
Networking Equipment, Software, and Licensing					
Interop Gateway w/24 talkpaths			$ -		$ -
Interop Gateway w/30 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
UPS			$ -		$ -
Integrated Trailer			$ -		$ -
84" Open Rack (Seismic)	$ 4,928.00	1	$ 4,928.00	26.00%	$ 3,646.72
Interop Gateway w/8 talkpaths	$ 66,551.50	1	$ 66,551.50	26.00%	$ 49,248.11
SUBTOTAL					**$ 56,870.30**
Site Infrastructure					
Tower, with Foundation & Construction			$ -	0.00%	$ -
Shelter, with Foundation & Construction			$ -	0.00%	$ -
Site Development - Roads, Fencing, Land Clearing			$ -	0.00%	$ -
Generator, 40KW with Foundation and LP Tank			$ -	0.00%	$ -
Electrical Work	$ 1,980.00	1	$ 1,980.00	0.00%	$ 1,980.00
DC Power			$ -	0.00%	$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acq, Tower Analysis	$ 3,960.00	1	$ 3,960.00	0.00%	$ 3,960.00
			$ -		$ -
SUBTOTAL (ALLOWANCE)					**$ 5,940.00**
Microwave Equipment, Software, and Licensing					
Microwave Hop	$ 96,460.40	1	$ 96,460.40	0.00%	$ 96,460.40
Optional Site On Wheels MW Equip			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 96,460.40**
TOTAL EQUIPMENT PRICE					**$ 573,477.99**

TABLE B.8 - WASHOE COUNTY SYSTEM INFRASTF					
	Site --->	11	Poito WC (Valley)		
Site Description --->			6 Channel Multisite / NCRN		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Secondary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
ISSI Gateway and Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
Logging Recorder - WCSD (OPTIONAL)			$ -		$ -
Logging Recorder - WC			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
2			$ -		$ -
6			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	6	$ 243,240.00	26.00%	$ 179,997.60
84" Open Rack (Seismic)	$ 4,928.00	4	$ 19,712.00	26.00%	$ 14,586.88
Site Interface Equipment - Conventional	$ 12,872.00	1	$ 12,872.00	26.00%	$ 9,525.28
TB9435 Conventional Repeater	$ 14,064.50	6	$ 84,387.00	26.00%	$ 62,446.38
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 302,279.64**

TABLE B.8 - WASHOE COUNTY SYSTEM INFRASTF					
	Site --->	11	Poito WC (Valley)		
Site Description --->			6 Channel Multisite / NCRN		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel			$ -		$ -
P25 Combiner - 6 channel	$ 8,287.50	0	$ -	0.00%	$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel	$ 10,875.00	1	$ 10,875.00	0.00%	$ 10,875.00
P25 Multicoupler - 8 Port			$ -		$ -
P25 Multicoupler - 16 Port	$ 2,322.50	1	$ 2,322.50	0.00%	$ 2,322.50
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 4,632.50	1	$ 4,632.50	10.00%	$ 4,169.25
P25 Antennas	$ 2,998.25	2	$ 5,996.50	0.00%	$ 5,996.50
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF	$ 12,320.00	1	$ 12,320.00	10.00%	$ 11,088.00
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF	$ 1,875.00	2	$ 3,750.00	0.00%	$ 3,750.00
Conventional Cables, Connectors, Filters	$ 10,045.00	1	$ 10,045.00	10.00%	$ 9,040.50
P25 Multicoupler - 24 Port			$ -		$ -
P25 Combiner - 7 channel					
P25 Combiner - 5 channel			$ -		$ -
SUBTOTAL					**$ 49,113.00**
Networking Equipment, Software, and Licensing					
Interop Gateway w/24 talkpaths			$ -		$ -
Interop Gateway w/30 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
UPS			$ -		$ -
Integrated Trailer			$ -		$ -
84" Open Rack (Seismic)	$ 4,928.00	1	$ 4,928.00	26.00%	$ 3,646.72
Interop Gateway w/8 talkpaths	$ 66,551.50	1	$ 66,551.50	26.00%	$ 49,248.11
SUBTOTAL					**$ 56,870.30**
Site Infrastructure					
Tower, with Foundation & Construction	$ 128,633.76	1	$ 128,633.76	0.00%	$ 128,633.76
Shelter, with Foundation & Construction	$ 206,397.49	1	$ 206,397.49	0.00%	$ 206,397.49
Site Development - Roads, Fencing, Land Clearing	$ 54,780.00	1	$ 54,780.00	0.00%	$ 54,780.00
Generator, 40KW with Foundation and LP Tank	$ 41,025.00	1	$ 41,025.00	0.00%	$ 41,025.00
Electrical Work	$ 18,810.00	1	$ 18,810.00	0.00%	$ 18,810.00
DC Power	$ 60,252.46	1	$ 60,252.46	0.00%	$ 60,252.46
AC Unit			$ -		$ -
Permits, Drawings, Site Acq, Tower Analysis	$ 44,220.00	1	$ 44,220.00	0.00%	$ 44,220.00
			$ -		$ -
SUBTOTAL (ALLOWANCE)					**$ 554,118.71**
Microwave Equipment, Software, and Licensing					
Microwave Hop	$ 94,566.23	1	$ 94,566.23	0.00%	$ 94,566.23
Optional Site On Wheels MW Equip			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 94,566.23**
TOTAL EQUIPMENT PRICE					**$ 1,072,487.88**

TABLE B.8 - WASHOE COUNTY SYSTEM INFRASTF					
	Site --->	12	Fox WC		
Site Description --->			5 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Secondary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
ISSI Gateway and Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
Logging Recorder - WCSD (OPTIONAL)			$ -		$ -
Logging Recorder - WC			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
2			$ -		$ -
6			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	5	$ 202,700.00	26.00%	$ 149,998.00
84" Open Rack (Seismic)	$ 4,928.00	2	$ 9,856.00	26.00%	$ 7,293.44
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 193,014.94**

TABLE B.8 - WASHOE COUNTY SYSTEM INFRASTR					
	Site --->	12	Fox WC		
Site Description --->			5 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel			$ -		$ -
P25 Combiner - 6 channel	$ 6,900.00	1	$ 6,900.00	0.00%	$ 6,900.00
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75	0.00%	$ 1,898.75
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 4,255.25	1	$ 4,255.25	10.00%	$ 3,829.73
P25 Antennas	$ 3,456.50	2	$ 6,913.00	0.00%	$ 6,913.00
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF			$ -		$ -
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF			$ -		$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Multicoupler - 24 Port			$ -		$ -
P25 Combiner - 7 channel					
P25 Combiner - 5 channel			$ -	0.00%	$ -
SUBTOTAL					**$ 21,412.73**
Networking Equipment, Software, and Licensing					
Interop Gateway w/24 talkpaths			$ -		$ -
Interop Gateway w/30 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
UPS			$ -		$ -
Integrated Trailer			$ -		$ -
84" Open Rack (Seismic)	$ 4,928.00	1	$ 4,928.00	26.00%	$ 3,646.72
Interop Gateway w/8 talkpaths	$ 66,551.50	1	$ 66,551.50	26.00%	$ 49,248.11
SUBTOTAL					**$ 56,870.30**
Site Infrastructure					
Tower, with Foundation & Construction			$ -	0.00%	$ -
Shelter, with Foundation & Construction			$ -	0.00%	$ -
Site Development - Roads, Fencing, Land Clearing			$ -	0.00%	$ -
Generator, 40KW with Foundation and LP Tank			$ -	0.00%	$ -
Electrical Work	$ 1,980.00	1	$ 1,980.00	0.00%	$ 1,980.00
DC Power			$ -	0.00%	$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acq, Tower Analysis	$ 3,960.00	1	$ 3,960.00	0.00%	$ 3,960.00
			$ -		$ -
SUBTOTAL (ALLOWANCE)					**$ 5,940.00**
Microwave Equipment, Software, and Licensing					
Microwave Hop	$ 174,431.69	1	$ 174,431.69	0.00%	$ 174,431.69
Optional Site On Wheels MW Equip			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 174,431.69**
TOTAL EQUIPMENT PRICE					**$ 467,209.65**

TABLE B.8 - WASHOE COUNTY SYSTEM INFRASTF					
	Site --->	13	Chimney Peak		
Site Description --->			Microwave Only		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Secondary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
ISSI Gateway and Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
Logging Recorder - WCSD (OPTIONAL)			$ -		$ -
Logging Recorder - WC			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite			$ -		$ -
Network Sentry - Simulcast Site	$ 15,000.00	0	$ -	26.00%	$ -
Network Sentry - Transportable Site			$ -		$ -
2			$ -		$ -
6			$ -		$ -
SUBTOTAL					**$ -**
Radio System Equipment, Software and Licensing					
Site Interface Equipment	$ 62,254.00	0	$ -	26.00%	$ -
MASTR V P25 Trunked Base Station	$ 40,540.00	0	$ -	26.00%	$ -
84" Open Rack (Seismic)	$ 4,928.00	0	$ -	26.00%	$ -
Site Interface Equipment - Conventional	$ 8,927.50	0	$ -	26.00%	$ -
TB9435 Conventional Repeater	$ 11,000.00	0	$ -	26.00%	$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**

TABLE B.8 - WASHOE COUNTY SYSTEM INFRASTF					
	Site --->	13	Chimney Peak		
Site Description --->			Microwave Only		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel			$ -		$ -
P25 Combiner - 6 channel			$ -		$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel	$ 12,916.25	0	$ -	0.00%	$ -
P25 Multicoupler - 8 Port			$ -		$ -
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	0	$ -	0.00%	$ -
P25 Cables, Connectors, Filters	$ 13,056.25	0	$ -	10.00%	$ -
P25 Antennas	$ 1,632.50	0	$ -	0.00%	$ -
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF			$ -		$ -
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF			$ -		$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Multicoupler - 24 Port			$ -		$ -
P25 Combiner - 7 channel					
P25 Combiner - 5 channel			$ -		$ -
SUBTOTAL					**$ -**
Networking Equipment, Software, and Licensing					
Interop Gateway w/24 talkpaths			$ -		$ -
Interop Gateway w/30 talkpaths			$ -		$ -
Cisco Switch DC 24-Port			$ -		$ -
UPS			$ -		$ -
Integrated Trailer			$ -		$ -
84" Open Rack (Seismic)			$ -		$ -
Interop Gateway w/8 talkpaths			$ -		$ -
SUBTOTAL					**$ -**
Site Infrastructure					
Tower, with Foundation & Construction			$ -		$ -
Shelter, with Foundation & Construction			$ -		$ -
Site Development - Roads, Fencing, Land Clearing			$ -		$ -
Generator, 40KW with Foundation and LP Tank			$ -		$ -
Electrical Work			$ -		$ -
DC Power			$ -		$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acq, Tower Analysis			$ -		$ -
			$ -		$ -
SUBTOTAL (ALLOWANCE)					**$ -**
Microwave Equipment, Software, and Licensing					
Microwave Hop	$ 74,714.08	1	$ 74,714.08		$ 74,714.08
Optional Site On Wheels MW Equip			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 74,714.08**
TOTAL EQUIPMENT PRICE					**$ 74,714.08**

TABLE B.8 - WASHOE COUNTY SYSTEM INFRASTF					
	Site --->	14	SITE 14		
Site Description --->			Transportable Site		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Secondary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
ISSI Gateway and Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
Logging Recorder - WCSD (OPTIONAL)			$ -		$ -
Logging Recorder - WC			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite			$ -		$ -
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
2			$ -		$ -
6			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment	$ 20,563.50	1	$ 20,563.50	26.00%	$ 15,216.99
MASTR V P25 Trunked Base Station	$ 40,540.00	4	$ 162,160.00	26.00%	$ 119,998.40
84" Open Rack (Seismic)	$ 4,928.00	1	$ 4,928.00	26.00%	$ 3,646.72
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 138,862.11**

TABLE B.8 - WASHOE COUNTY SYSTEM INFRASTF					
	Site --->	14	SITE 14		
Site Description --->			Transportable Site		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel	$ 4,912.50	1	$ 4,912.50	0.00%	$ 4,912.50
P25 Combiner - 6 channel	$ 13,050.00	0	$ -	10.00%	$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port			$ -		$ -
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	0	$ -	0.00%	$ -
P25 Cables, Connectors, Filters	$ 1,920.00	1	$ 1,920.00	10.00%	$ 1,728.00
P25 Antennas	$ 3,500.00	1	$ 3,500.00	10.00%	$ 3,150.00
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF			$ -		$ -
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF			$ -		$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Multicoupler - 24 Port			$ -		$ -
P25 Combiner - 7 channel					
P25 Combiner - 5 channel			$ -		$ -
SUBTOTAL					**$ 9,790.50**
Networking Equipment, Software, and Licensing					
Interop Gateway w/24 talkpaths			$ -		$ -
Interop Gateway w/30 talkpaths			$ -		$ -
Cisco Switch DC 24-Port			$ -		$ -
UPS	$ 5,625.00	1	$ 5,625.00	0.00%	$ 5,625.00
Integrated Trailer	$ 97,547.50	1	$ 97,547.50	0.00%	$ 97,547.50
84" Open Rack (Seismic)			$ -		$ -
Interop Gateway w/8 talkpaths			$ -		$ -
SUBTOTAL					**$ 103,172.50**
Site Infrastructure					
Tower, with Foundation & Construction			$ -		$ -
Shelter, with Foundation & Construction			$ -		$ -
Site Development - Roads, Fencing, Land Clearing			$ -		$ -
Generator, 40KW with Foundation and LP Tank			$ -		$ -
Electrical Work			$ -		$ -
DC Power			$ -		$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acq, Tower Analysis			$ -		$ -
			$ -		$ -
SUBTOTAL (ALLOWANCE)					**$ -**
Microwave Equipment, Software, and Licensing					
Microwave Hop			$ -		$ -
Optional Site On Wheels MW Equip	$ 47,802.00		$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 267,365.11**

TABLE B.8 - WASHOE COUNTY SYSTEM INFRASTR		GREENFIELD SITES
	Site Description --->	TOTAL
Subsystem Category		Equipment Discounted
System Control Equipment, Software, and Licensing		
Secondary NSC Premier Server with SW & Lics		$ -
Primary VIDA Connect Core with SW & Lics		$ -
Distributed Control Point Licenses		$ -
ISSI Gateway and Licenses		$ -
Asset Manager - CommSHOP 360		$ -
Logging Recorder - WCSD (OPTIONAL)		$ -
Logging Recorder - WC		$ -
		$ -
		$ -
	SUBTOTAL	**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing		
Network Sentry - Multisite		$ 77,700.00
Network Sentry - Simulcast Site		$ -
Network Sentry - Transportable Site		$ -
2		$ -
6		$ -
	SUBTOTAL	**$ 77,700.00**
Radio System Equipment, Software and Licensing		
Site Interface Equipment		$ 190,969.58
MASTR V P25 Trunked Base Station		$ 899,988.00
84" Open Rack (Seismic)		$ 40,113.92
Site Interface Equipment - Conventional		$ -
TB9435 Conventional Repeater		$ -
		$ -
		$ -
	SUBTOTAL	**$ 1,131,071.50**

TABLE B.8 - WASHOE COUNTY SYSTEM INFRASTR		
		GREENFIELD SITES
Site Description --->		TOTAL
Subsystem Category		Equipment Discounted
Antenna Systems		
P25 Combiner - 4 channel	$	14,737.50
P25 Combiner - 6 channel	$	13,800.00
P25 Combiner - 8 channel	$	8,887.50
P25 Combiner - 10 channel	$	-
P25 Multicoupler - 8 Port	$	7,595.00
P25 Multicoupler - 16 Port	$	2,322.50
Tower Top Amplifier	$	9,356.25
P25 Cables, Connectors, Filters	$	25,893.00
P25 Antennas	$	26,992.00
Conventional Combiner - 800MHz	$	-
Conventional Combiner - VHF	$	-
Conventional Multicoupler	$	-
Conventional Antenna - 800 MHz	$	-
Conventional Antenna - VHF	$	-
Conventional Cables, Connectors, Filters	$	-
P25 Multicoupler - 24 Port	$	-
P25 Combiner - 7 channel		
P25 Combiner - 5 channel	$	-
SUBTOTAL	**$**	**109,583.75**
Networking Equipment, Software, and Licensing		
Interop Gateway w/24 talkpaths	$	-
Interop Gateway w/30 talkpaths	$	-
Cisco Switch DC 24-Port	$	19,877.33
UPS	$	-
Integrated Trailer	$	-
84" Open Rack (Seismic)	$	18,233.60
Interop Gateway w/8 talkpaths	$	246,240.55
SUBTOTAL	**$**	**284,351.48**
Site Infrastructure		
Tower, with Foundation & Construction	$	643,168.80
Shelter, with Foundation & Construction	$	1,031,987.45
Site Development - Roads, Fencing, Land Clearing	$	273,900.00
Generator, 40KW with Foundation and LP Tank	$	205,125.00
Electrical Work	$	94,050.00
DC Power	$	301,262.31
AC Unit	$	-
Permits, Drawings, Site Acq, Tower Analysis	$	221,100.00
	$	-
SUBTOTAL (ALLOWANCE)	**$**	**2,770,593.56**
Microwave Equipment, Software, and Licensing		
Microwave Hop	$	490,773.07
Optional Site On Wheels MW Equip	$	-
	$	-
SUBTOTAL	**$**	**490,773.07**
TOTAL EQUIPMENT PRICE	**$**	**4,864,073.36**

TABLE B.8 - WASHOE COUNTY SYSTEM INFRASTR					
	Site --->	1	49 Mountain		
Site Description --->			3 Channel Multicast		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Secondary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
ISSI Gateway and Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
Logging Recorder - WCSD (OPTIONAL)			$ -		$ -
Logging Recorder - WC			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
2			$ -		$ -
6			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	3	$ 121,620.00	26.00%	$ 89,998.80
84" Open Rack (Seismic)	$ 4,928.00	2	$ 9,856.00	26.00%	$ 7,293.44
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 133,015.74**

TABLE B.8 - WASHOE COUNTY SYSTEM INFRASTR					
	Site --->	1	49 Mountain		
Site Description --->			3 Channel Multicast		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel	$ 4,912.50	1	$ 4,912.50	0.00%	$ 4,912.50
P25 Combiner - 6 channel			$ -		$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75	0.00%	$ 1,898.75
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 4,693.25	1	$ 4,693.25	10.00%	$ 4,223.93
P25 Antennas	$ 2,305.00	3	$ 6,915.00	0.00%	$ 6,915.00
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF			$ -		$ -
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF			$ -		$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Multicoupler - 24 Port			$ -		$ -
P25 Combiner - 7 channel					
P25 Combiner - 5 channel			$ -		$ -
SUBTOTAL					**$ 19,821.43**
Networking Equipment, Software, and Licensing					
Interop Gateway w/24 talkpaths			$ -		$ -
Interop Gateway w/30 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
UPS			$ -		$ -
Integrated Trailer			$ -		$ -
84" Open Rack (Seismic)	$ 4,928.00	1	$ 4,928.00	26.00%	$ 3,646.72
Interop Gateway w/8 talkpaths	$ 66,551.50	1	$ 66,551.50	26.00%	$ 49,248.11
SUBTOTAL					**$ 56,870.30**
Site Infrastructure					
Tower, with Foundation & Construction	$ 128,633.76	1	$ 128,633.76	0.00%	$ 128,633.76
Shelter, with Foundation & Construction	$ 206,397.49	1	$ 206,397.49	0.00%	$ 206,397.49
Site Development - Roads, Fencing, Land Clearing	$ 54,780.00	1	$ 54,780.00	0.00%	$ 54,780.00
Generator, 40KW with Foundation and LP Tank	$ 41,025.00	1	$ 41,025.00	0.00%	$ 41,025.00
Electrical Work	$ 18,810.00	1	$ 18,810.00	0.00%	$ 18,810.00
DC Power	$ 60,252.46	1	$ 60,252.46	0.00%	$ 60,252.46
AC Unit			$ -		$ -
Permits, Drawings, Site Acq, Tower Analysis	$ 44,220.00	1	$ 44,220.00	0.00%	$ 44,220.00
			$ -		$ -
SUBTOTAL (ALLOWANCE)					**$ 554,118.71**
Microwave Equipment, Software, and Licensing					
Microwave Hop	$ 118,084.26	1	$ 118,084.26	0.00%	$ 118,084.26
Optional Site On Wheels MW Equip			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 118,084.26**
TOTAL EQUIPMENT PRICE					**$ 897,450.43**

TABLE B.8 - WASHOE COUNTY SYSTEM INFRASTR					
	Site --->	2	Yellow Peak		
Site Description --->			3 Channel Multicast		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Secondary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
ISSI Gateway and Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
Logging Recorder - WCSD (OPTIONAL)			$ -		$ -
Logging Recorder - WC			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
2			$ -		$ -
6			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	3	$ 121,620.00	26.00%	$ 89,998.80
84" Open Rack (Seismic)	$ 4,928.00	2	$ 9,856.00	26.00%	$ 7,293.44
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 133,015.74**

TABLE B.8 - WASHOE COUNTY SYSTEM INFRASTR					
	Site --->	2	Yellow Peak		
Site Description --->			3 Channel Multicast		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel	$ 4,912.50	1	$ 4,912.50	0.00%	$ 4,912.50
P25 Combiner - 6 channel			$ -		$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75	0.00%	$ 1,898.75
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 4,693.25	1	$ 4,693.25	10.00%	$ 4,223.93
P25 Antennas	$ 2,141.25	2	$ 4,282.50	0.00%	$ 4,282.50
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF			$ -		$ -
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF			$ -		$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Multicoupler - 24 Port			$ -		$ -
P25 Combiner - 7 channel					
P25 Combiner - 5 channel			$ -		$ -
SUBTOTAL					**$ 17,188.93**
Networking Equipment, Software, and Licensing					
Interop Gateway w/24 talkpaths			$ -		$ -
Interop Gateway w/30 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
UPS			$ -		$ -
Integrated Trailer			$ -		$ -
84" Open Rack (Seismic)	$ 4,928.00	1	$ 4,928.00	26.00%	$ 3,646.72
Interop Gateway w/8 talkpaths	$ 66,551.50	1	$ 66,551.50	26.00%	$ 49,248.11
SUBTOTAL					**$ 56,870.30**
Site Infrastructure					
Tower, with Foundation & Construction	$ 128,633.76	1	$ 128,633.76	0.00%	$ 128,633.76
Shelter, with Foundation & Construction	$ 206,397.49	1	$ 206,397.49	0.00%	$ 206,397.49
Site Development - Roads, Fencing, Land Clearing	$ 54,780.00	1	$ 54,780.00	0.00%	$ 54,780.00
Generator, 40KW with Foundation and LP Tank	$ 41,025.00	1	$ 41,025.00	0.00%	$ 41,025.00
Electrical Work	$ 18,810.00	1	$ 18,810.00	0.00%	$ 18,810.00
DC Power	$ 60,252.46	1	$ 60,252.46	0.00%	$ 60,252.46
AC Unit			$ -		$ -
Permits, Drawings, Site Acq, Tower Analysis	$ 44,220.00	1	$ 44,220.00	0.00%	$ 44,220.00
			$ -		$ -
SUBTOTAL (ALLOWANCE)					**$ 554,118.71**
Microwave Equipment, Software, and Licensing					
Microwave Hop	$ 71,275.15	1	$ 71,275.15	0.00%	$ 71,275.15
Optional Site On Wheels MW Equip			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 71,275.15**
TOTAL EQUIPMENT PRICE					**$ 848,008.82**

TABLE B.8 - WASHOE COUNTY SYSTEM INFRASTR					
	Site --->	3	Red Rock		
Site Description --->			4 Channel Multicast		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Secondary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
ISSI Gateway and Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
Logging Recorder - WCSD (OPTIONAL)			$ -		$ -
Logging Recorder - WC			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
2			$ -		$ -
6			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	4	$ 162,160.00	26.00%	$ 119,998.40
84" Open Rack (Seismic)	$ 4,928.00	2	$ 9,856.00	26.00%	$ 7,293.44
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 163,015.34**

TABLE B.8 - WASHOE COUNTY SYSTEM INFRASTR					
	Site --->	3	Red Rock		
Site Description --->			4 Channel Multicast		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel	$ 4,912.50	1	$ 4,912.50	0.00%	$ 4,912.50
P25 Combiner - 6 channel			$ -		$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75	0.00%	$ 1,898.75
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 4,805.50	1	$ 4,805.50	10.00%	$ 4,324.95
P25 Antennas	$ 2,992.50	2	$ 5,985.00	0.00%	$ 5,985.00
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF			$ -		$ -
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF			$ -		$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Multicoupler - 24 Port			$ -		$ -
P25 Combiner - 7 channel					
P25 Combiner - 5 channel			$ -		$ -
SUBTOTAL					**$ 18,992.45**
Networking Equipment, Software, and Licensing					
Interop Gateway w/24 talkpaths			$ -		$ -
Interop Gateway w/30 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
UPS			$ -		$ -
Integrated Trailer			$ -		$ -
84" Open Rack (Seismic)	$ 4,928.00	1	$ 4,928.00	26.00%	$ 3,646.72
Interop Gateway w/8 talkpaths	$ 66,551.50	1	$ 66,551.50	26.00%	$ 49,248.11
SUBTOTAL					**$ 56,870.30**
Site Infrastructure					
Tower, with Foundation & Construction	$ 128,633.76	1	$ 128,633.76	0.00%	$ 128,633.76
Shelter, with Foundation & Construction	$ 206,397.49	1	$ 206,397.49	0.00%	$ 206,397.49
Site Development - Roads, Fencing, Land Clearing	$ 54,780.00	1	$ 54,780.00	0.00%	$ 54,780.00
Generator, 40KW with Foundation and LP Tank	$ 41,025.00	1	$ 41,025.00	0.00%	$ 41,025.00
Electrical Work	$ 18,810.00	1	$ 18,810.00	0.00%	$ 18,810.00
DC Power	$ 60,252.46	1	$ 60,252.46	0.00%	$ 60,252.46
AC Unit			$ -		$ -
Permits, Drawings, Site Acq, Tower Analysis	$ 44,220.00	1	$ 44,220.00	0.00%	$ 44,220.00
			$ -		$ -
SUBTOTAL (ALLOWANCE)					**$ 554,118.71**
Microwave Equipment, Software, and Licensing					
Microwave Hop	$ 70,131.25	1	$ 70,131.25	0.00%	$ 70,131.25
Optional Site On Wheels MW Equip			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 70,131.25**
TOTAL EQUIPMENT PRICE					**$ 878,668.05**

TABLE B.8 - WASHOE COUNTY SYSTEM INFRASTR					
	Site --->	4	Truckee Station 18		
Site Description --->			8 Channel Multicast		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Secondary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
ISSI Gateway and Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
Logging Recorder - WCSD (OPTIONAL)			$ -		$ -
Logging Recorder - WC			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
2			$ -		$ -
6			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment	$ 53,935.00	1	$ 53,935.00	26.00%	$ 39,911.90
MASTR V P25 Trunked Base Station	$ 40,540.00	8	$ 324,320.00	26.00%	$ 239,996.80
84" Open Rack (Seismic)	$ 4,928.00	2	$ 9,856.00	26.00%	$ 7,293.44
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 287,202.14**

TABLE B.8 - WASHOE COUNTY SYSTEM INFRASTR					
	Site --->	4	Truckee Station 18		
Site Description --->			8 Channel Multicast		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel			$ -		$ -
P25 Combiner - 6 channel			$ -		$ -
P25 Combiner - 8 channel	$ 8,887.50	1	$ 8,887.50		$ 8,887.50
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75	0.00%	$ 1,898.75
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 5,254.50	1	$ 5,254.50	10.00%	$ 4,729.05
P25 Antennas	$ 1,798.75	2	$ 3,597.50	0.00%	$ 3,597.50
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF			$ -		$ -
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF			$ -		$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Multicoupler - 24 Port			$ -		$ -
P25 Combiner - 7 channel					
P25 Combiner - 5 channel			$ -		$ -
SUBTOTAL					**$ 20,984.05**
Networking Equipment, Software, and Licensing					
Interop Gateway w/24 talkpaths			$ -		$ -
Interop Gateway w/30 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
UPS			$ -		$ -
Integrated Trailer			$ -		$ -
84" Open Rack (Seismic)	$ 4,928.00	1	$ 4,928.00	26.00%	$ 3,646.72
Interop Gateway w/8 talkpaths	$ 66,551.50	1	$ 66,551.50	26.00%	$ 49,248.11
SUBTOTAL					**$ 56,870.30**
Site Infrastructure					
Tower, with Foundation & Construction	$ 128,633.76	1	$ 128,633.76	0.00%	$ 128,633.76
Shelter, with Foundation & Construction	$ 206,397.49	1	$ 206,397.49	0.00%	$ 206,397.49
Site Development - Roads, Fencing, Land Clearing	$ 54,780.00	1	$ 54,780.00	0.00%	$ 54,780.00
Generator, 40KW with Foundation and LP Tank	$ 41,025.00	1	$ 41,025.00	0.00%	$ 41,025.00
Electrical Work	$ 18,810.00	1	$ 18,810.00	0.00%	$ 18,810.00
DC Power	$ 60,252.46	1	$ 60,252.46	0.00%	$ 60,252.46
AC Unit			$ -		$ -
Permits, Drawings, Site Acq, Tower Analysis	$ 44,220.00	1	$ 44,220.00	0.00%	$ 44,220.00
			$ -		$ -
SUBTOTAL (ALLOWANCE)					**$ 554,118.71**
Microwave Equipment, Software, and Licensing					
Microwave Hop	$ 65,886.64	1	$ 65,886.64	0.00%	$ 65,886.64
Optional Site On Wheels MW Equip			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 65,886.64**
TOTAL EQUIPMENT PRICE					**$ 1,000,601.84**

TABLE B.8 - WASHOE COUNTY SYSTEM INFRASTR					
	Site --->	5	Smokey Quartz		
Site Description --->			12 Channel Multicast		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Secondary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
ISSI Gateway and Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
Logging Recorder - WCSD (OPTIONAL)			$ -		$ -
Logging Recorder - WC			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
2			$ -		$ -
6			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment	$ 59,307.00	1	$ 59,307.00	26.00%	$ 43,887.18
MASTR V P25 Trunked Base Station	$ 40,540.00	12	$ 486,480.00	26.00%	$ 359,995.20
84" Open Rack (Seismic)	$ 4,928.00	3	$ 14,784.00	26.00%	$ 10,940.16
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 414,822.54**

TABLE B.8 - WASHOE COUNTY SYSTEM INFRASTR					
	Site --->	5	Smokey Quartz		
Site Description --->			12 Channel Multicast		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel			$ -		$ -
P25 Combiner - 6 channel	$ 6,900.00	2	$ 13,800.00		$ 13,800.00
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port			$ -	0.00%	$ -
P25 Multicoupler - 16 Port	$ 2,322.50	1	$ 2,322.50	0.00%	$ 2,322.50
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 9,323.50	1	$ 9,323.50	10.00%	$ 8,391.15
P25 Antennas	$ 3,106.00	2	$ 6,212.00	0.00%	$ 6,212.00
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF			$ -		$ -
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF			$ -		$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Multicoupler - 24 Port			$ -		$ -
P25 Combiner - 7 channel					
P25 Combiner - 5 channel			$ -		$ -
SUBTOTAL					**$ 32,596.90**
Networking Equipment, Software, and Licensing					
Interop Gateway w/24 talkpaths			$ -		$ -
Interop Gateway w/30 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
UPS			$ -		$ -
Integrated Trailer			$ -		$ -
84" Open Rack (Seismic)	$ 4,928.00	1	$ 4,928.00	26.00%	$ 3,646.72
Interop Gateway w/8 talkpaths	$ 66,551.50	1	$ 66,551.50	26.00%	$ 49,248.11
SUBTOTAL					**$ 56,870.30**
Site Infrastructure					
Tower, with Foundation & Construction	$ 128,633.76	1	$ 128,633.76	0.00%	$ 128,633.76
Shelter, with Foundation & Construction	$ 206,397.49	1	$ 206,397.49	0.00%	$ 206,397.49
Site Development - Roads, Fencing, Land Clearing	$ 54,780.00	1	$ 54,780.00	0.00%	$ 54,780.00
Generator, 40KW with Foundation and LP Tank	$ 41,025.00	1	$ 41,025.00	0.00%	$ 41,025.00
Electrical Work	$ 18,810.00	1	$ 18,810.00	0.00%	$ 18,810.00
DC Power	$ 60,252.46	1	$ 60,252.46	0.00%	$ 60,252.46
AC Unit			$ -		$ -
Permits, Drawings, Site Acq, Tower Analysis	$ 44,220.00	1	$ 44,220.00	0.00%	$ 44,220.00
			$ -		$ -
SUBTOTAL (ALLOWANCE)					**$ 554,118.71**
Microwave Equipment, Software, and Licensing					
Microwave Hop	$ 83,001.74	1	$ 83,001.74	0.00%	$ 83,001.74
Optional Site On Wheels MW Equip			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 83,001.74**
TOTAL EQUIPMENT PRICE					**$ 1,156,950.19**

TABLE B.8 - WASHOE COUNTY SYSTEM INFRASTR					
	Site --->	6	Ophir Peak		
Site Description --->			Microwave Only		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Secondary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
ISSI Gateway and Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
Logging Recorder - WCSD (OPTIONAL)			$ -		$ -
Logging Recorder - WC			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite			$ -		$ -
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
2			$ -		$ -
6			$ -		$ -
SUBTOTAL					**$ -**
Radio System Equipment, Software and Licensing					
Site Interface Equipment			$ -		$ -
MASTR V P25 Trunked Base Station			$ -		$ -
84" Open Rack (Seismic)			$ -		$ -
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**

TABLE B.8 - WASHOE COUNTY SYSTEM INFRASTR					
	Site --->	6	Ophir Peak		
Site Description --->			Microwave Only		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel			$ -		$ -
P25 Combiner - 6 channel			$ -		$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port			$ -		$ -
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier			$ -		$ -
P25 Cables, Connectors, Filters			$ -		$ -
P25 Antennas			$ -		$ -
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF			$ -		$ -
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF			$ -		$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Multicoupler - 24 Port			$ -		$ -
P25 Combiner - 7 channel					
P25 Combiner - 5 channel			$ -		$ -
SUBTOTAL					**$ -**
Networking Equipment, Software, and Licensing					
Interop Gateway w/24 talkpaths			$ -		$ -
Interop Gateway w/30 talkpaths			$ -		$ -
Cisco Switch DC 24-Port			$ -		$ -
UPS			$ -		$ -
Integrated Trailer			$ -		$ -
84" Open Rack (Seismic)			$ -		$ -
Interop Gateway w/8 talkpaths			$ -		$ -
SUBTOTAL					**$ -**
Site Infrastructure					
Tower, with Foundation & Construction			$ -		$ -
Shelter, with Foundation & Construction			$ -		$ -
Site Development - Roads, Fencing, Land Clearing					
Generator, 40KW with Foundation and LP Tank					
Electrical Work			$ -		$ -
DC Power			$ -		$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acq, Tower Analysis			$ -		$ -
			$ -		$ -
SUBTOTAL (ALLOWANCE)					**$ -**
Microwave Equipment, Software, and Licensing					
Microwave Hop	$ 82,394.03	1	$ 82,394.03		$ 82,394.03
Optional Site On Wheels MW Equip			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 82,394.03**
TOTAL EQUIPMENT PRICE					**$ 82,394.03**

TABLE B.9 - WASHOE COUNTY RECOMMENDED SPARE EQUIPMENT

Itemize the recommended spare equipment, test equipment, and spare parts to be purchased by the Member with the Base Proposal system (initial outfitting). Add additional rows as necessary.

EXAMPLES OF ITEMS ARE: complete base radios, System and GPS antennas, field replaceable units, circuit boards, power supplies, routers, switches, parts, test equipment, calibration equipment, diagnostic equipment, and repair kits.

Part Number	Item	Unit Price	Qty	Extended Price	Discount %	Discounted Price
MASV-800M1-A	STATION,MASTR V,P25T,800 MHZ,799-817 RX	$ 40,540.00	4	$ 162,160.00	26%	$ 119,998.40
MASV-700M1	Station,MASTR V,P25T,700MHz	$ 40,540.00	4	$ 162,160.00	26%	$ 119,998.40
Several (Set)	Site Interface Equipment - P25	$ 48,275.00	2	$ 96,550.00	26%	$ 71,447.00
SAMD7Y-DC	KIT, NET SENTRY, CNTL/DATA, DC PWR,WIN10	$ 21,000.00	3	$ 63,000.00	26%	$ 46,620.00
SV-PS2P-DC	Power Supply,-48V,DC,MASTR V	$ 1,993.00	4	$ 7,972.00	26%	$ 5,899.28
SV-AW5L	Power Amplifier,Linear,700 MHz	$ 8,000.00	4	$ 32,000.00	26%	$ 23,680.00
	Antenna Equipment					
E75-4000-007	SURGE SUPPRESSOR,800-2500MHZ BROADBAND	$ 144.00	2	$ 288.00	10%	$ 259.20
DS7A06F36U6D .	746-869 MHz 6 dB Gain Omni Fiberglass Antenna with DIN connector	$ 1,231.25	1	$ 1,231.25	0%	$ 1,231.25
DS7A08F36UD .	746-869 MHz 8 dB Gain Omni Fiberglass Antenna with DIN connector	$ 1,487.50	1	$ 1,487.50	0%	$ 1,487.50
DS7C10F36U-D .	764-869 MHz 10 dB Gain Omni Fiberglass Antenna with DIN connector	$ 2,110.00	1	$ 2,110.00	0%	$ 2,110.00
DS7A06F36U3D .	746-869 MHz 6 dB Gain Omni Fiberglass Antenna with DIN connector 3 Degree downtilt	$ 1,231.25	1	$ 1,231.25	0%	$ 1,231.25
DS7C10F36U3D .	764-869 MHz 10 dB Gain Omni Fiberglass Antenna with DIN connector 3 Degree downtilt	$ 2,141.25	1	$ 2,141.25	0%	$ 2,141.25
SC479-HF1LDF(E5608)(D02)	COLL OMNI 746-869 MHz 9 DB NULL FILL	$ 2,695.00	1	$ 2,695.00	0%	$ 2,695.00
SC432D-HF6LDF(D00-i40-G06)	SC432 DUAL 746-869 MHZ 6 DBD GN 40	$ 2,365.00	1	$ 2,365.00	0%	$ 2,365.00
SC412-HF2LDF(D01-E5608)	SC412 746-869 MHZ 11.5 DBD NUL FILL	$ 3,860.31	1	$ 3,860.31	0%	$ 3,860.31
SC412-HF2LDF(E5608)	SC412 746-869 MHZ 11.5 DBD GN NULL	$ 3,674.69	1	$ 3,674.69	0%	$ 3,674.69
DSCC75-10DS .	763-776 MHz 10 Channel Ceramic Cavity Combiner with SMARTtune Power Monitor DIN output	$ 10,875.00	1	$ 10,875.00	0%	$ 10,875.00
DSCC85-10DS .	851-869 MHz 10 Channel Ceramic Cavity Combiner with SMARTtune Power Monitor DIN Output	$ 10,875.00	1	$ 10,875.00	0%	$ 10,875.00
CP00921 .	8 Port Receiver Multicoupler	$ 1,898.75	1	$ 1,898.75	0%	$ 1,898.75
CP00921, CP11151 .	16 Port Receiver Multicoupler	$ 2,322.50	1	$ 2,322.50	0%	$ 2,322.50
CP00921, CP11151, CP01102 .	24 Port Receiver Multicoupler	$ 2,885.00	1	$ 2,885.00	0%	$ 2,885.00
CP00732 .	Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0%	$ 1,871.25
MANG-GTWY	Interop Gateway	$ 75,768.50	2	$ 151,537.00	26%	$ 112,137.38
	Simulcast Equipment					
SC-VTXP25-DC	MASTR V IP Simulcast,Tx Site,Comm Equip	$ 34,000.00	1	$ 34,000.00	26%	$ 25,160.00
SC-MD7B-DC	ASSY,CONTROLLER,SITEPRO,MME W/ CABLES DC	$ 19,500.00	2	$ 39,000.00	26%	$ 28,860.00
SA-MD6H	OSCILLATOR, 10MHZ REF,-12VDC,6 PORT	$ 5,729.00	3	$ 17,187.00	26%	$ 12,718.38
	Core Equipment					
MANS-CP9B	Netclock,GPS Master Clock	$ 5,950.00	1	$ 5,950.00	26%	$ 4,403.00
NS-PNSJ	SERVER, VIDA PREMIER, SR10A.4	$ 54,950.00	1	$ 54,950.00	26%	$ 40,663.00
VS-CN1J	SERVER,UNITRENDS RS606 BACKUP APPLIANCE	$ 13,745.00	1	$ 13,745.00	26%	$ 10,171.30
	Routing Equipment					
VS-CR90	ROUTER,ISR4321 WSEC BDL LIC	$ 4,061.51	1	$ 4,061.51	26%	$ 3,005.52
VS-CR72	ROUTER,ISR4331 AX APP &SEC LIC	$ 7,091.22	1	$ 7,091.22	26%	$ 5,247.50
VSCR28	Router,1921,Advanced Security,AC Power	$ 2,256.49	1	$ 2,256.49	26%	$ 1,669.80
VS-CR94	RTR 1921 DATA AC	$ 2,100.00	1	$ 2,100.00	26%	$ 1,554.00
VS-CU5C	SWITCH,CISCO ME 3400E,DC,24-PORT	$ 5,324.28	1	$ 5,324.28	26%	$ 3,939.97
VS-CU6G	MODULE,CISCO EHWIC-4ESG 4-PORT GIG INT	$ 425.00	1	$ 425.00	26%	$ 314.50
VS-CR1G	ROUTER,ISR4221-SEC/K9	$ 2,900.00	1	$ 2,900.00	26%	$ 2,146.00
VSCU3H	SWITCH,CISCO 2960 PLUS	$ 1,454.57	1	$ 1,454.57	26%	$ 1,076.38
VSMA6N	KIT,MTG HDWR,CISCO 2960 MASTR III/V CAB	$ 69.88	1	$ 69.88	26%	$ 51.71
VS-CR1F	ROUTER,ISR4221/K9	$ 1,700.00	1	$ 1,700.00	26%	$ 1,258.00
VS-CU7Z	MODULE,NIM 4PORT LAYER2 GE	$ 567.00	1	$ 567.00	26%	$ 419.58
VS-CR92	SWITCH,CATALYST 3650 24P IP	$ 5,312.63	1	$ 5,312.63	26%	$ 3,931.35
VS-CU7Y	MODULE,SFP GBIC	$ 346.83	2	$ 693.66	26%	$ 513.31
VSCR29	Router,1921,Advanced Security,DC Power	$ 3,116.00	1	$ 3,116.00	26%	$ 2,305.84
VS-CU5H	CISCO MODULE,SX MULTIMODE,FIBR	$ 429.63	1	$ 429.63	26%	$ 317.93
	TOTAL TEST EQUIPMENT AND SPARES COST>>>>			**$ 929,524.62**		**$ 701,290.47**

TABLE B.10.A - WASHOE COUNTY BASE PROPOSAL SERVICES PRICES

Description	Services Prices
System Equipment Services	
Staging Acceptance Testing	$ 41,897.00
Delivery/Shipping	$ 10,763.55
Installation (including all equipment, antenna systems, old equipment removal, etc.)	$ 559,649.50
Other - specify	
Other - specify	
System Equipment Services Subtotal	**$ 612,310.05**
System Engineering	
System/Network Engineering (including coverage analysis and testing, documentation, system acceptance testing, etc.)	$ 698,381.00
Interference Analyses	incl above
FCC License Preparation	$ 24,506.00
Frequency Coordination	$ 31,406.00
Structural Analyses	
Other - specify	
System Engineering Subtotal	**$ 754,293.00**
Site Development	
Site Development (Site Mgrs and Site Surveys)	$ 322,048.00
Other - specify	
Site Development Subtotal	**$ 322,048.00**
Migration Services	
Migration Services (Included in System Engineering and Project Management)	
Other - specify	
Migration Services Subtotal	**$ -**
Project Management	
Project Management	$ 331,647.00
Other - specify	
Project Management Subtotal	**$ 331,647.00**
System Training	
Training,Customized	$ 6,450.00
Training,Web-Based	$ 9,000.00
Training,P25 Structuring Wrkshp	$ 9,159.00
Training,Unified Admin System	$ 6,433.88
Training-Regional Network Manager	$ 6,433.88
Training,Over The Air Rekeying	$ 3,676.50
Training,Radio Programming	$ 3,676.50
TRAINING,ISSI CONFIGURATION & ADMIN	$ 3,676.50
Training,P25 Sys Maintenance	$ 13,556.40
Training-Regional Network Manager	$ 4,279.28
Training-Network Operation and Maint.	$ 6,091.80
Training,MASTR V Maintenance	$ 4,279.28
Training,P25 Simulcast System Maint	$ 6,091.80
Training,RF Maintenance	$ 9,731.87
Training,Console Configuration Support	$ 29,925.00
Training,Web-Based	$ 3,375.00
Training,User Equipment Operation	$ 11,400.00
Training,Web-Based	$ 110,362.50
System Training Subtotal	**$ 247,599.19**
Performance Bond	Included
TOTAL SERVICES	**$ 2,267,897.24**

TABLE B.10.B - WASHOE COUNTY GREENFIELD SITES SERVICES PRICES	
Description	**Services Prices**
System Equipment Services	
Staging Acceptance Testing	$ 20,636.00
Delivery/Shipping	$ 5,301.45
Installation (including all equipment, antenna systems, towers, shelters, etc.)	$ 285,539.50
Other - specify	
Other - specify	
System Equipment Services Subtotal	**$ 311,476.95**
System Engineering	
System/Network Engineering (including coverage analysis and testing, documentation, system acceptance testing, etc.)	$ 409,319.00
Interference Analyses	incl above
FCC License Preparation	$ 12,064.00
Frequency Coordination	$ 15,469.00
Structural Analyses {Permitting and Soils Analysis}	
Other - specify	
System Engineering Subtotal	**$ 436,852.00**
Site Development	
Site Development	$ 158,621.00
Other - specify	
Site Development Subtotal	**$ 158,621.00**
Migration Services	
Migration Services (Included in System Engineering and Project Management)	
Other - specify	
Migration Services Subtotal	**$ -**
Project Management	
Project Management	$ 165,821.00
Other - specify	
Project Management Subtotal	**$ 165,821.00**
TOTAL SERVICES	**$ 1,072,770.95**

TABLE B.11 - TOTAL GREENFIELD PRICE SUMMARY
TABLE B.11 provides a summary of the Greenfield Sites Price broken down by NDOT (Table B.11.A), NV Energy (Table B.11.B) and Washoe County (Table B.11.C) equipment and services.

TABLE B.11.C - WASHOE COUNTY TOTAL PRICE SUMMARY		
System Equipment		**Discounted Price**
System Control Equipment, Software, and Licensing	$	-
Network Monitoring and Fault Management Equipment, Software, and Licensing	$	77,700.00
Radio System Equipment, Software, and Licensing	$	1,131,071.50
Antenna Systems	$	109,583.75
Networking Equipment, Software, and Licensing	$	284,351.48
Site Infrastructure - NTE ESTIMATE (Civils)	$	2,770,593.56
Microwave Equipment, Software, and Licensing	$	490,773.07
TOTAL EQUIPMENT PRICE	**$**	**4,864,073.36**
Deployment Services		
System Equipment Services	$	311,476.95
System Engineering	$	436,852.00
Site Development	$	158,621.00
Migration Services	$	-
Project Management	$	165,821.00
TOTAL SERVICES PRICE	**$**	**1,072,770.95**
WASHOE COUNTY PROPOSAL PRICE	**$**	**5,936,844.31**
Discount		
WASHOE COUNTY DISCOUNTED PROPOSAL PRICE	**$**	**5,936,844.31**

TABLE B.12 - SYSTEM LIFECYCLE SUPPORT

These items and services will be considered for purchase in the future (but not delivered as part of initial system replacement project).

The Members plan on purchasing items and services at a fixed discount rate off of the List Price published at the time of purchase.

Table B.12.A - FUTURE EQUIPMENT AND COMPONENTS

EXAMPLES OF EQUIPMENT AND COMPONENT ITEMS ARE: complete base radios, antenna systems (antenna, transmission line, etc.), field replaceable units, circuit boards, power supplies, routers, switches, parts, test equipment, calibration equipment, diagnostic equipment, repair kits, software, software licensing, etc.

Description	List Price	Fixed Discount % Off of List Price	Discounted Price
RF Infrastructure Equipment and Parts	Per Catalog	26.00%	$ -
Base Stations, Site Interface Equipment, Routers, Switches			$ -
			$ -
User Radios and Parts	Per Catalog	See Table in Contract	
Radios, Accessories, Features			$ -
			$ -
Antenna Systems and Parts	Per Catalog	10.00%	$ -
			$ -
Software and Licenses	Per Catalog	26.00%	$ -

Table B.12.B - FUTURE SERVICES

EXAMPLES OF FUTURE SERVICES ARE: engineering services, field support services, project management, etc. Specify any daily or hourly rates and applicable discounts.

Description	List Price (Hourly Rate-Fully Burdened)	Fixed Discount % Off of List Price	Discounted Price
SERVICE, RF INTEGRITY Daily rate for Engineering services to predict RF coverage from designated transmission site.	$ 151.25	0.00%	$ 151.25
			$ -
SERVICE, HARRIS SYSTEM ENGINEERING Daily rate for System Engineering Services.	$ 198.75	0.00%	$ 198.75
			$ -
SERVICE, HARRIS SENIOR SYSTEM ENGINEERING Daily rate for Senior System Engineering Services	$ 300.00	0.00%	$ 300.00
			$ -
SERVICE, HARRIS PROJECT MANAGEMENT Daily rate for Project Management to assist implementing customer projects.	$ 198.75	0.00%	$ 198.75
			$ -
SERVICE, HARRIS SENIOR PROJECT MANAGEMENT Daily rate for Senior Project Management to assist implementing customer projects.	$ 300.00	0.00%	$ 300.00
			$ -
SERVICE, DATA SYSTEM ENGINEER Daily rate for Data System Engineer	$ 187.50	0.00%	$ 187.50
			$ -
SERVICE, SENIOR SYSTEM TECHNICIAN, DAILY RATE Daily rate for Senior Technicians to perform installation, testing, system alignment or evaluate special applications. Travel and living will be billed inaddition to this fee	$ 150.00	0.00%	$ 150.00
			$ -
SERVICE, SYSTEM TECHNICIAN, DAILY RATE Daily rate for Technicians to perform installation, testing, system alignment or evaluate special applications. Travel and living will be billed inaddition to this fee	$ 125.00	0.00%	$ 125.00

TABLE B.13 - SYSTEM POST-WARRANTY SUPPORT

This Table is for SYSTEM POST-WARRANTY SUPPORT

Table B.13.G - WASHOE COUNTY TECHNICAL SUPPORT SERVICE

List the price for TECHNICAL SUPPORT that commences upon expiration of the one-year warranty.

Description	Services Price
Technical Support for Year 2 - Extended Warranty	$ 20,968.00
Technical Support for Year 3 - Extended Warranty	$ 20,968.00
Technical Support for Year 4 - Maintenance	$ 20,968.00
Technical Support for Year 5 - Maintenance	$ 20,968.00
Technical Support for Year 6 - Maintenance	$ 20,968.00
Technical Support for Year 7 - Maintenance	$ 20,968.00
Technical Support for Year 8 - Maintenance	$ 20,968.00
Technical Support for Year 9 - Maintenance	$ 20,968.00
Technical Support for Year 10 - Maintenance	$ 20,968.00
TOTAL Technical Support for Years 2-10	**$ 188,712.00**

Table B.13.H - WASHOE COUNTY SOFTWARE SUPPORT AND UPGRADES

List the price for SOFTWARE SUPPORT AND UPGRADES that are available after the one-year warranty period ends.

Description	Services Price
Software Support and Upgrades for Year 2 - Extended Warranty	$ 59,375.00
Software Support and Upgrades for Year 3 - Extended Warranty	$ 72,303.00
Software Support and Upgrades for Year 4 - Maintenance	$ 72,303.00
Software Support and Upgrades for Year 5 - Maintenance	$ 72,303.00
Software Support and Upgrades for Year 6 - Maintenance	$ 72,303.00
Software Support and Upgrades for Year 7 - Maintenance	$ 72,303.00
Software Support and Upgrades for Year 8 - Maintenance	$ 72,303.00
Software Support and Upgrades for Year 9 - Maintenance	$ 72,303.00
Software Support and Upgrades for Year 10 - Maintenance	$ 72,303.00
TOTAL Software Support and Upgrades for Years 2-10	**$ 637,799.00**

TABLE B.13 - SYSTEM POST-WARRANTY SUPPORT

Table B.13.I - WASHOE COUNTY EXTENDED WARRANTY

List prices for EXTENDED WARRANTY available after the full one-year warranty.

Description		Services Price
Extended Warranty for Year 2 - Infrastructure & Radios -Extended Warranty		$ 185,202.00
Extended Warranty for Year 3 - Infrastructure Extended Warranty		$ 261,281.00
Extended Warranty for Year 3 - Radios Extended Warranty		$ 86,995.00
Extended Warranty for Year 4 - Infrastructure Extended Warranty (Maint.)		$ 285,734.00
Depot R&R	$69,535	
Issue Resolution	$116,340	
Microwave	$10,069	
Logging Recorders	$89,790	
Extended Warranty for Year 5 - Infrastructure Extended Warranty (Maint.)		$ 289,654.00
Depot R&R	$70,927	
Issue Resolution	$118,667	
Microwave	$10,270	
Logging Recorders	$89,790	
Extended Warranty for Year 6 - Infrastructure Extended Warranty (Maint.)		$ 305,323.00
Depot R&R	$72,344	
Issue Resolution	$121,040	
Microwave	$10,476	
Logging Recorders	$101,463	
Extended Warranty for Year 7 - Infrastructure Extended Warranty (Maint.)		$ 309,400.00
Depot R&R	$73,791	
Issue Resolution	$123,461	
Microwave	$10,685	
Logging Recorders	$101,463	
Extended Warranty for Year 8 - Infrastructure Extended Warranty (Maint.)		$ 313,559.00
Depot R&R	$75,267	
Issue Resolution	$125,930	
Microwave	$10,899	
Logging Recorders	$101,463	
Extended Warranty for Year 9 - Infrastructure Extended Warranty (Maint.)		$ 317,801.00
Depot R&R	$76,772	
Issue Resolution	$128,449	
Microwave	$11,117	
Logging Recorders	$101,463	
Extended Warranty for Year 10 - Infrastructure Extended Warranty (Maint.)		$ 322,127.00
Depot R&R	$78,307	
Issue Resolution	$131,018	
Microwave	$11,339	
Logging Recorders	$101,463	
TOTAL Extended Warranty for Years 2-10		**$ 2,677,076.00**
TOTAL WASHOE COUNTY SYSTEM POST-WARRANTY SUPPORT		**$ 3,503,587.00**

TABLE B.14 - DISPATCH EQUIPMENT AND SERVICES

This Table is for dispatch equipment and logging recorders that may be procured by the Members as part of the contract and/or future purchase(s).

Table B.14.C - WASHOE COUNTY DISPATCH EQUIPMENT

Item	Unit Price	Qty	Extended Price	Discount %	Discounted Price
Dispatch console - Symphony Console w/AES Ecrypt, 2 spkrs, 21.5" Monitor, Headset, and Desk Mic (Washoe NOC)	$ 58,500.00	1	$ 58,500.00	26%	$ 43,290.00
Dispatch console- Symphony Console w/AES Ecrypt, 2 spkrs, 21.5" Monitor, Headset, and Desk Mic (Detention)	$ 58,500.00	2	$ 117,000.00	26%	$ 86,580.00
Dispatch console - Symphony Console w/AES Ecrypt, 2 spkrs, 21.5" Monitor, Headset, and Desk Mic (Court Complex)	$ 58,500.00	1	$ 58,500.00	26%	$ 43,290.00
Dispatch console- Symphony Console w/AES Ecrypt, 2 spkrs, 21.5" Monitor, Headset, and Desk Mic (WCSD)	$ 58,500.00	6	$ 351,000.00	26%	$ 259,740.00
Dispatch console- Symphony Console w/AES Ecrypt, 2 spkrs, 21.5" Monitor, Headset, and Desk Mic (WCRCS)	$ 58,500.00	2	$ 117,000.00	26%	$ 86,580.00
Console/System Interface Equip (Router/Switch) NOC, Sparks, Detention, Court Complex, WCSD, Reno Airport, WCRCS	$ 8,140.45	7	$ 56,983.15	26%	$ 42,167.53
Microwave Hops - NOC	$ 178,844.85	1	$ 178,844.85	0%	$ 178,844.85
Microwave Hops - Sparks	$ 71,977.01	1	$ 71,977.01	0%	$ 71,977.01
UPS 60 Hz Power Supply	$ 3,020.00	12	$ 36,240.00	100%	$ -
			$ -		$ -
			$ -		$ -
			$ -		$ -
			$ -		$ -
			$ -		$ -
TOTAL WASHOE COUNTY DISPATCH COST					$ 812,469.39

DISPATCH SERVICES

EXAMPLES OF DISPATCH SERVICES ARE: engineering, equipment installation, console programming, removal of old equipment, project management, training, software support, etc.

Enter the daily or hourly rate and any applicable discount for each service that can be provided. Add additional rows as needed.

Table B.14.F - WASHOE COUNTY DISPATCH SERVICES

Description	Rate	Total
Installation and Programming	LS	$ 22,000.00
Engineering - Included in Table B.10		
Proj Mgmt - Included in Table B.10		
Training - Included in Table B.10		
Removal of old equipment included in Install and Programming Price		
TOTAL WASHOE COUNTY DISPATCH SERVICES		$ 22,000.00

TOTAL WASHOE COUNTY DISPATCH EQUIPMENT AND SERVICES	$ 834,469.39

TABLE B.15 - USER RADIO EQUIPMENT AND SERVICES

This Table is for user radio equipment that may be procured by the Members as part of the contract and/or future purchase(s). Portables pricing to include portable battery. Contractor to include optional pricing for each type of radio (portable, mobile, and control station/desktop radio) for:
* OTAR * OTAP *GPS (integrated in the radio) * Intrinsically safe * Voice Playback *Spare battery * Single battery charger * Multiple batteries charger * In-vehicle battery charger * Types of portable belt clips and attachments * Shoulder/lapel mic * Noise cancellation * Wi-Fi Capable *Integrated cellular data modem * Cellular LMR app * P25 Phase 1 & 2 * P25 Trunking * Dual-band (700/800MHz) & VHF * Multi-band * Different Antennas and * Programming cable and any other common features/functionality. Note that all batteries should be of the lithium type.

Table B.15.C - WASHOE COUNTY SUBSCRIBER EQUIPMENT (all radios include P25 and EDACS trunking, except XG-15P which is P25 only)

Item	Unit Price	Qty	Extended Price	Discount %	Discounted Price
User Radios - XG-25M Mobile Low Tier Front Mount, Single Key AES, PH 2, OTAP, Data, LLA, Mic, Antenna (500M Replacements)	$ 4,040.00	39	$ 157,560.00	72.2%	$ 43,801.68
User Radios - XG-25M Mobile Low Tier Front Mount, Single Key AES, PH 2, OTAP, LLA, Mic, Antenna (M5300 Replacements)	$ 3,820.00	0	$ -	72.2%	$ -
User Radios - XG-25M Mobile Low Tier Front Mount, Single Key AES, PH 2, OTAP, LLA, Mic, Antenna (M7100 Replacements)	$ 3,820.00	0	$ -	72.2%	$ -
User Radios - XG-25M Mobile Low Tier Front Mount, Single Key AES, PH 2, OTAP, LLA, Mic, Antenna (Orion 12W Replacements)	$ 3,820.00	0	$ -	72.2%	$ -
User Radios - XG-25M Mobile Low Tier Front Mount, Single Key AES, PH 2, OTAP, LLA, Mic, Antenna (Orion 35W Replacements)	$ 3,820.00	0	$ -	72.2%	$ -
User Radios - XG-25M Mobile Low Tier Front Mount, Single Key AES, PH 2, LLA, Mic, Antenna (Orion Front/Rear Replacements)	$ 3,820.00	0	$ -	72.2%	$ -
User Radios - XG-75M Mobile Mid Tier System Remote Mount with PH 2, Multi Key AES, ProVoice, OTAR, OTAP, GPS, LLA, Mic, Antenna (Public Safety Replacements)	$ 7,140.00	0	$ -	72.2%	$ -
User Radios - XG-75M Mobile Mid Tier System Remote Mount with PH 2, Single Key AES, OTAP, LLA, Mic, Antenna (M7100 Replacements)	$ 4,975.00	0	$ -	72.2%	$ -
User Radios - XG-75M Mobile Mid Tier System Remote Mount with PH 2, Multi Key AES, ProVoice, OTAR, OTAP, GPS, LLA, Mic, Antenna (M7100 Replacements)	$ 7,140.00	1112	$ 7,939,680.00	72.2%	$ 2,207,231.04
User Radios - XG-75M Mobile Mid Tier System Remote Mount with PH 2, Single Key AES, OTAP, LLA, Mic, Antenna (Orion 12W Replacements)	$ 4,975.00	0	$ -	72.2%	$ -
User Radios - XG-75M Mobile Mid Tier System Remote Mount with PH 2, Multi Key AES, ProVoice, OTAR, OTAP, GPS, LLA, Mic, Antenna (Orion 12W Replacements)	$ 7,140.00	0	$ -	72.2%	$ -
User Radios - XG-75M Mobile Mid Tier System Remote Mount with PH 2, Single Key AES, OTAP, LLA, Mic, Antenna (Orion 35W Replacements)	$ 4,975.00	44	$ 218,900.00	72.2%	$ 60,854.20

User Radios - XG-75M Mobile Mid Tier System Remote Mount with PH 2, Multi Key AES, ProVoice, OTAR, OTAP, GPS, LLA, Mic, Antenna (Orion 35W Replacements)	$ 7,140.00	0	$ -	72.2%	$ -
User Radios - XG-100M Multiband Mobile High Tier with Multi Key AES, ProVoice, PH 2, OTAR, OTAP, GPS, LLA, Mic, Antenna	$ 8,795.00	0	$ -	72.2%	$ -
User Radios - XL-200M Multiband Mobile High Tier with Multi Key AES, ProVoice, PH 2, OTAR, OTAP, GPS, LLA, Mic, Antenna	$ 9,095.00	582	$ 5,293,290.00	72.2%	$ 1,471,534.62
User Radios - XG-75PE Portable System Mid Tier PH 2, OTAP, OTAR, GPS, LLA, Multi Key AES, Provoice, Immersible, Spkr Mic, Battery, Antenna, Leather Case (Replacements)	$ 6,015.00	1342	$ 8,072,130.00	72.2%	$ 2,244,052.14
User Radios - XL-185P Portable FKP Mid Tier PH2, OTAP, OTAR, GPS, LLA, Multi Key AES, ProVoice, Immersible, Spkr Mic, Battery, Antenna, Leather Case	$ 6,125.00	1480	$ 9,065,000.00	72.2%	$ 2,520,070.00
User Radios - XL-200P FKP Multiband Portable High Tier with Multi Key AES, ProVoice, PH 2, OTAR, OTAP, GPS, LLA, Immersible, Spkr Mic, Battery, Antenna, Leather Case	$ 6,775.00	35	$ 237,125.00	72.2%	$ 65,920.75
User Radios - XG-25P Portable Sys, Low Tier with Single Key AES, PH 2, OTAP, LLA, Battery, Antenna, Belt Clip	$ 3,345.00	80	$ 267,600.00	72.2%	$ 74,392.80
User Radios - XG-25P Portable Sys Low Tier with, Single Key AES, PH 2, OTAP, OTAR, LLA, Battery, Antenna, Belt Clip	$ 3,810.00	3	$ 11,430.00	72.2%	$ 3,177.54
User Radios - XG-25P Portable Sys Low Tier with Single Key AES, ProVoice, PH 2, OTAP, OTAR, LLA, Battery, Antenna, Belt Clip	$ 4,305.00	9	$ 38,745.00	72.2%	$ 10,771.11
User Radios - XG-15P Portable Low Tier with Single Key AES, PH 2, OTAP, LLA, Battery, Antenna, Belt Clip, Charger	$ 2,135.00	257	$ 548,695.00	72.2%	$ 152,537.21
Single Desktop Charger (XG-25, XG-75)	$ 120.00	1428	$ 171,360.00	72.2%	$ 47,638.08
Single Desktop Charger (XL-185, XL-200)	$ 150.00	1509	$ 226,350.00	72.2%	$ 62,925.30
User Radios - XG-75M CS-7000 Local Control Station High Tier with PH 2, OTAP, LLA, Mic, Antenna (Orion Desk Top Station Replacements)	$ 9,180.00	94	$ 862,920.00	72.2%	$ 239,891.76
User Radios - XG-75M CS-7000 Local Control Station High Tier with PH 2, AES Encryption, ProVoice, OTAP, OTAR, LLA, Mic, Antenna (Orion Desk Top Station Replacements)	$ 9,675.00	20	$ 193,500.00	72.2%	$ 53,793.00
Upgrade Existing CS-7000	$ 1,025.00	1	$ 1,025.00	77%	$ 240.50
Upgrade Existing M7300's	$ 1,598.25	215	$ 343,623.75	49%	$ 176,057.10
Upgrade Existing P7350's	$ 1,352.50	6	$ 8,115.00	45%	$ 4,451.10
Upgrade Existing P7370's	$ 1,464.50	17	$ 24,896.50	55%	$ 11,170.30
Upgrade Existing Unity XG-100Ms	$ 731.50	13	$ 9,509.50	35%	$ 6,186.40
Upgrade Existing XG-25Ms	$ 825.00	12	$ 9,900.00	57%	$ 4,225.40
Upgrade Existing XG-25Ps	$ 393.75	48	$ 18,900.00	68%	$ 5,994.00
Upgrade Existing XG-75Ms	$ 937.40	19	$ 17,810.60	32%	$ 12,143.40
Upgrade Existing XG-75Ps	$ 957.75	452	$ 432,903.00	46%	$ 233,767.62
Upgrade Existing XL-200Ps	$ 1,466.50	9	$ 13,198.50	60%	$ 5,328.00
			TOTAL WASHOE COUNTY SUBSCRIBER COST		$ 9,718,155.05

Individual Feature and Accessory Prices (For Information Only)			**Discounted Price**		
OTAP (OVER-THE-AIR PROGRAMMING)	$ 265.00		$ 196.10	26%	
OTAR (OVER-THE-AIR-REKEYING)	$ 595.00		$ 440.30	26%	
AES Encryption	$ 695.00		$ 514.30	26%	
P25 Trunking	$ 1,500.00		$ 1,110.00	26%	
P25 Phase 2	$ 250.00		$ 185.00	26%	
Dual Band Operation 700/800 and VHF or UHF	$ 1,000.00		$ 740.00	26%	
Multi Band Operation 700/800 and VHF and UHF	$ 1,500.00		$ 1,110.00	26%	
Wi-Fi Capable (XL-200P)	$ 985.00		$ 728.90	26%	
In-Band GPS	$ 200.00		$ 148.00	26%	
StatusAware License	$ 40.00		$ 29.60	26%	
BeOn User License	$ 325.00		$ 240.50	26%	
Intrinsically Safe	$ 200.00		$ 148.00	26%	
Li-Ion Battery	$ 150.00		$ 111.00	26%	
Li-Polymer Battery	$ 140.00		$ 103.60	26%	
Single Charger - XL200P	$ 150.00		$ 111.00	26%	
Single Charger - XG75/25P	$ 120.00		$ 88.80	26%	
6 Bay Multi Charger - XL200P	$ 795.00		$ 588.30	26%	
6 Bay Multi Charger - XG75/25P	$ 695.00		$ 514.30	26%	
Vehicular Charger	$ 175.00		$ 129.50	26%	
Leather Case w/Shoulder Strap	$ 150.00		$ 111.00	26%	
Leather Case w/Belt Loop, D-Swivel	$ 140.00		$ 103.60	26%	
Leather Belt Loop	$ 60.00		$ 44.40	26%	
Belt Clip	$ 25.00		$ 18.50	26%	
Speaker Mic - Premium Fire Mic (Noise Cancelling)	$ 630.00		$ 466.20	26%	
Speaker Mic - GPS (For XG75/25P)	$ 575.00		$ 425.50	26%	
Speaker Mic - Bluetooth Wireless	$ 299.00		$ 221.26	26%	
Speaker Mic	$ 160.00		$ 118.40	26%	
SP721 Digital Remote Controllers	$ 3,020.00		$ 2,234.80	26%	
ANTENNA, FLEX, HELICAL, 136-870 MHZ	$ 100.00		$ 74.00	26%	
ANTENNA, WHIP, DUAL-BAND, UHF/700/800 MHZ	$ 50.00		$ 37.00	26%	
ANTENNA, WHIP, 1/2 WAVE 762-870 MHZ	$ 35.00		$ 25.90	26%	
1 Year Extended Warranty - Single Band Portable	$ 60.00		$ 60.00	0%	
2 Year Extended Warranty - Single Band Portable	$ 110.00		$ 110.00	0%	
3 Year Extended Warranty - Single Band Portable	$ 160.00		$ 160.00	0%	
1 year Extended Warranty - Single Band Mobile	$ 80.00		$ 80.00	0%	
2 Year Extended Warranty - Single Band Mobile	$ 130.00		$ 130.00	0%	
3 Year Extended Warranty - Single Band Mobile	$ 180.00		$ 180.00	0%	
1 Year Extended Warranty - Multi-Band Portable	$ 150.00		$ 150.00	0%	
2 Year Extended Warranty - Multi-Band Portable	$ 200.00		$ 200.00	0%	
1 Year Extended Warranty - Multi-Band Mobile	$ 170.00		$ 170.00	0%	
2 Year Extended Warranty - Multi-Band Mobile	$ 220.00		$ 220.00	0%	
Existing Radios will be upgraded to P25 free of charge					

SUBSCRIBER SERVICES

EXAMPLES OF SUBSCRIBER SERVICES ARE: engineering, equipment installation, radio programming, equipment removal,

Enter the daily or hourly rate and any applicable discount for each service that can be provided. Add additional rows as

Table B.15.F - WASHOE COUNTY SUBSCRIBER SERVICES

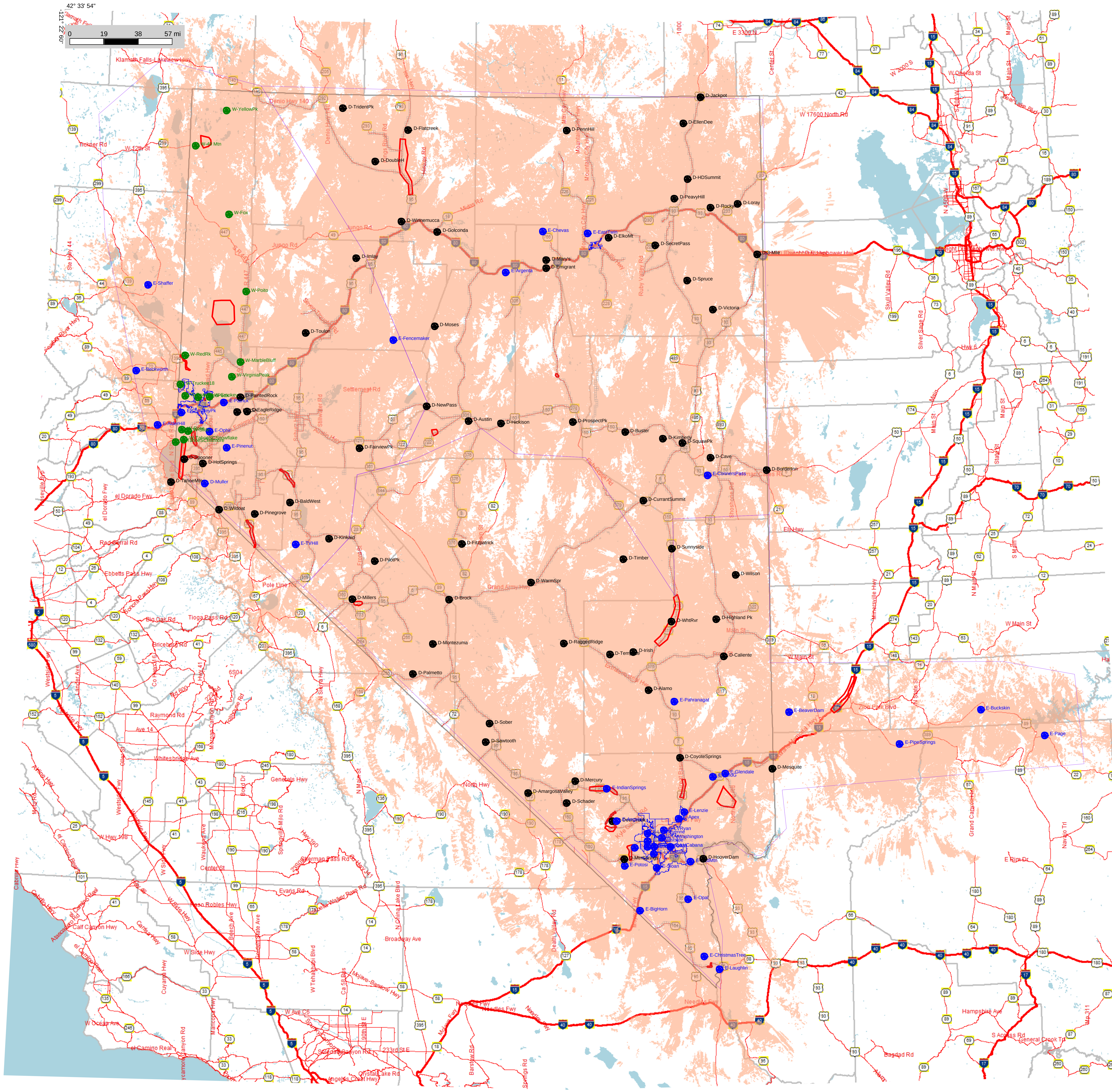
Radio Programming (per radio for quantities in Table B.15.C) Replacement Radios	$ 31.90	$ 162,594.30
Radio Programming (per radio for quantities in Table B.15.C) Upgraded Radios	$ 289.00	$ 228,888.00
Mobile and Desktop Installation (per radio for quantities in Table B.15.C)	$ 450.00	$ 850,950.00
TOTAL WASHOE COUNTY SUBSCRIBER SERVICES		**$ 1,242,432.30**

TOTAL WASHOE COUNTY SUBSCRIBER COSTS AND SERVICES	**$ 10,960,587.35**

RF Integrity

RAPTR Version 29.2.440
Tuesday, August 07, 2018 16:55:30
Project: NSRS RAPTR_2016
MBP: 16024
Figure: Fig. 01 NSRS Composite 127 Sites Portable Talk Out (Downlink) DAQ 3.4
Engineer:
Map type - 1:2,350,000
Note: Map depicts coverage across the defined service area. Statistical variability does not allow
for guarantee of coverage in specific locations, but does represent graphically area % coverage.

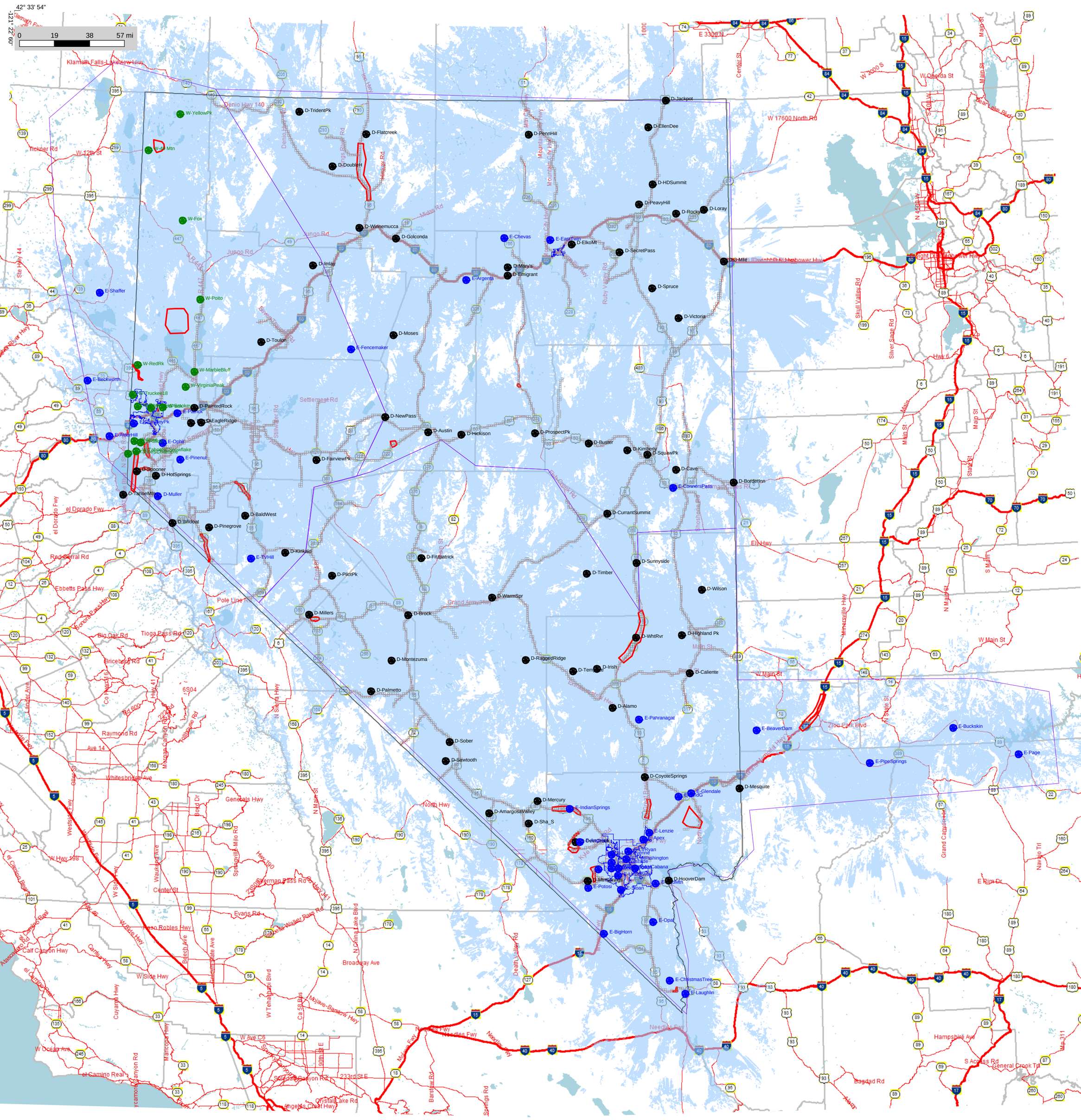
- NDOT Site
- NVE Site
- Washoe County Site



RF Integrity

RAPTR Version 29.2.440
Wednesday, August 08, 2018 17:37:19
Project: NSRS RAPTR_2016
MBP: 16024
Figure: Fig. 02 NSRS Composite 127 Sites Portable TalkBack (Uplink) DAQ 3.4
Engineer:
Map type - 1:2,350,000
Note: Map depicts coverage across the defined service area. Statistical variability does not allow for guarantee of coverage in specific locations, but does represent graphically area % coverage.

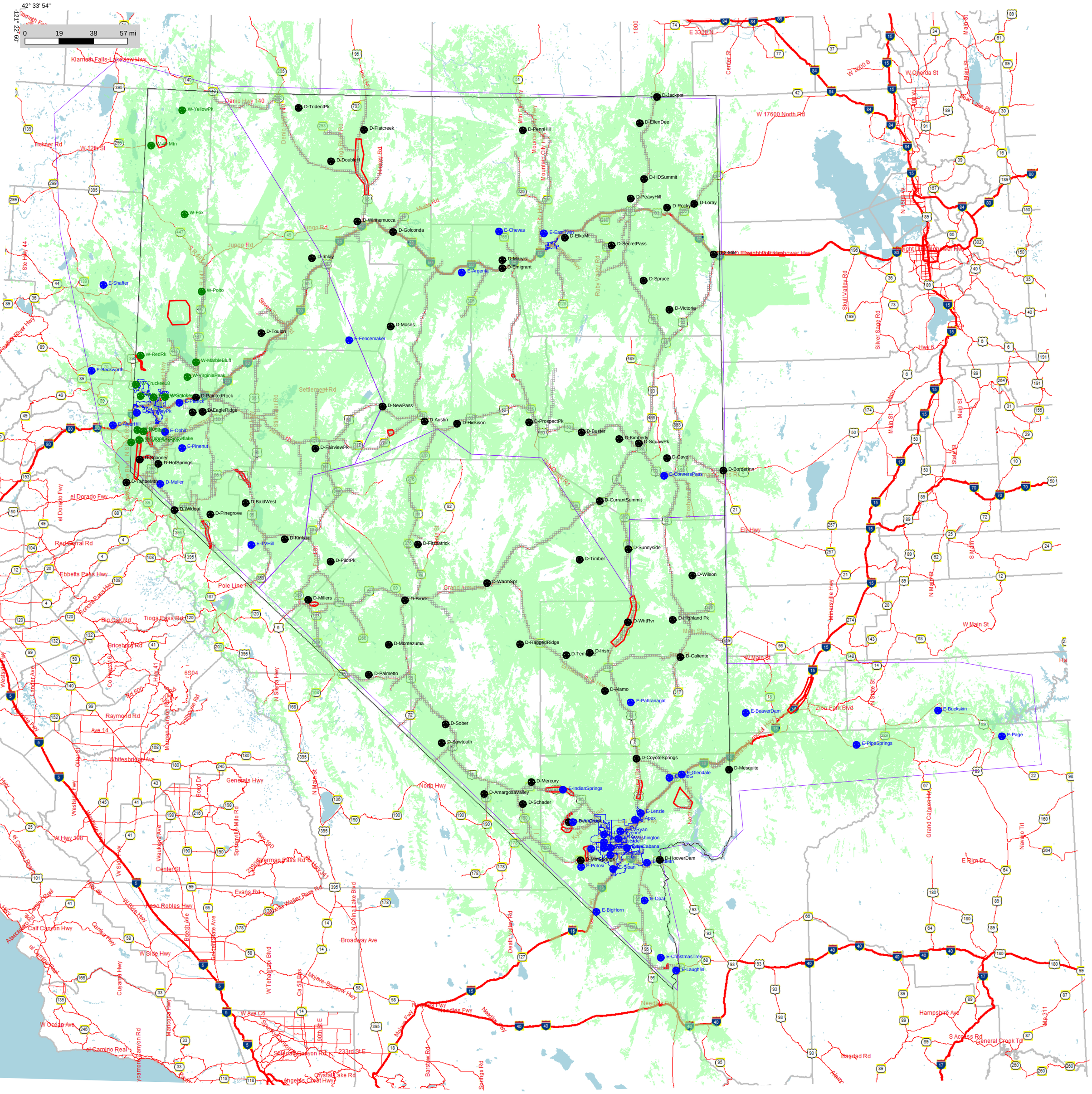
- NDOT Site
- NVE Site
- Washoe County Site



RF Integrity

RAPTR Version 29.2.440
Wednesday, August 08, 2018 16:01:58
Project: NSRS RAPTR_2016
MBP: 16024
Figure: Fig. 03 NSRS Composite 127 Sites Portable Talk Out (Downlink) DAQ 3.4 Indoors FOR INFORMATION ONLY
Engineer:
Map type - 1:2,350,000
Note: Map depicts coverage across the defined service area. Statistical variability does not allow for guarantee of coverage in specific locations, but does represent graphically area % coverage.

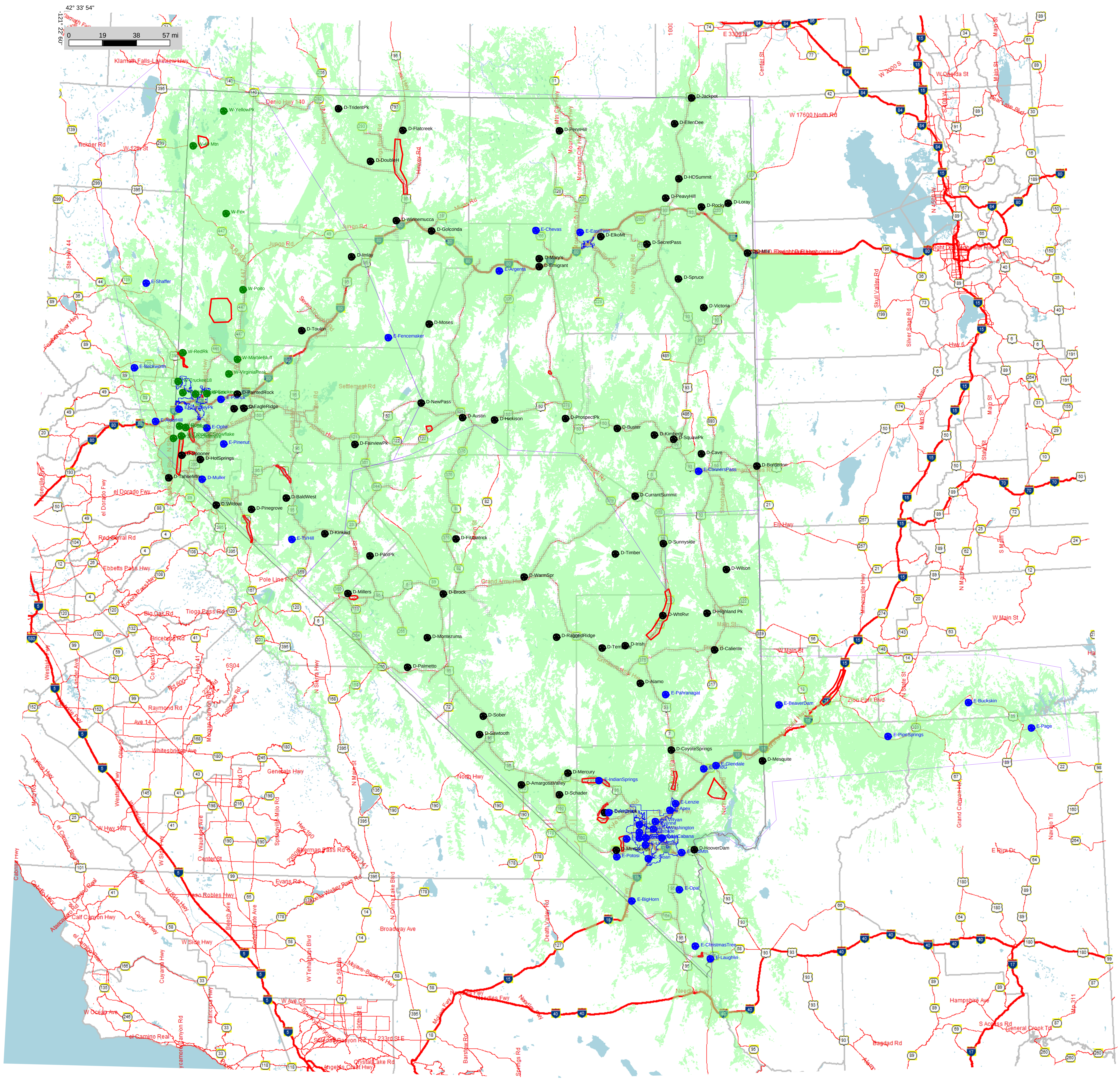
- NDOT Site
- NVE Site
- Washoe County Site



RF Integrity

RAPTR Version 29.2.440
Wednesday, August 08, 2018 16:24:56
Project: NSRS RAPTR_2016
MBP: 16024
Figure: Fig. 04 NSRS Composite 127 Sites Portable TalkBack (Uplink) DAQ 3.4 Indoors FOR INFORMATION ONLY
Engineer:
Map type - 1:2,350,000
Note: Map depicts coverage across the defined service area. Statistical variability does not allow
for guarantee of coverage in specific locations, but does represent graphically area % coverage.

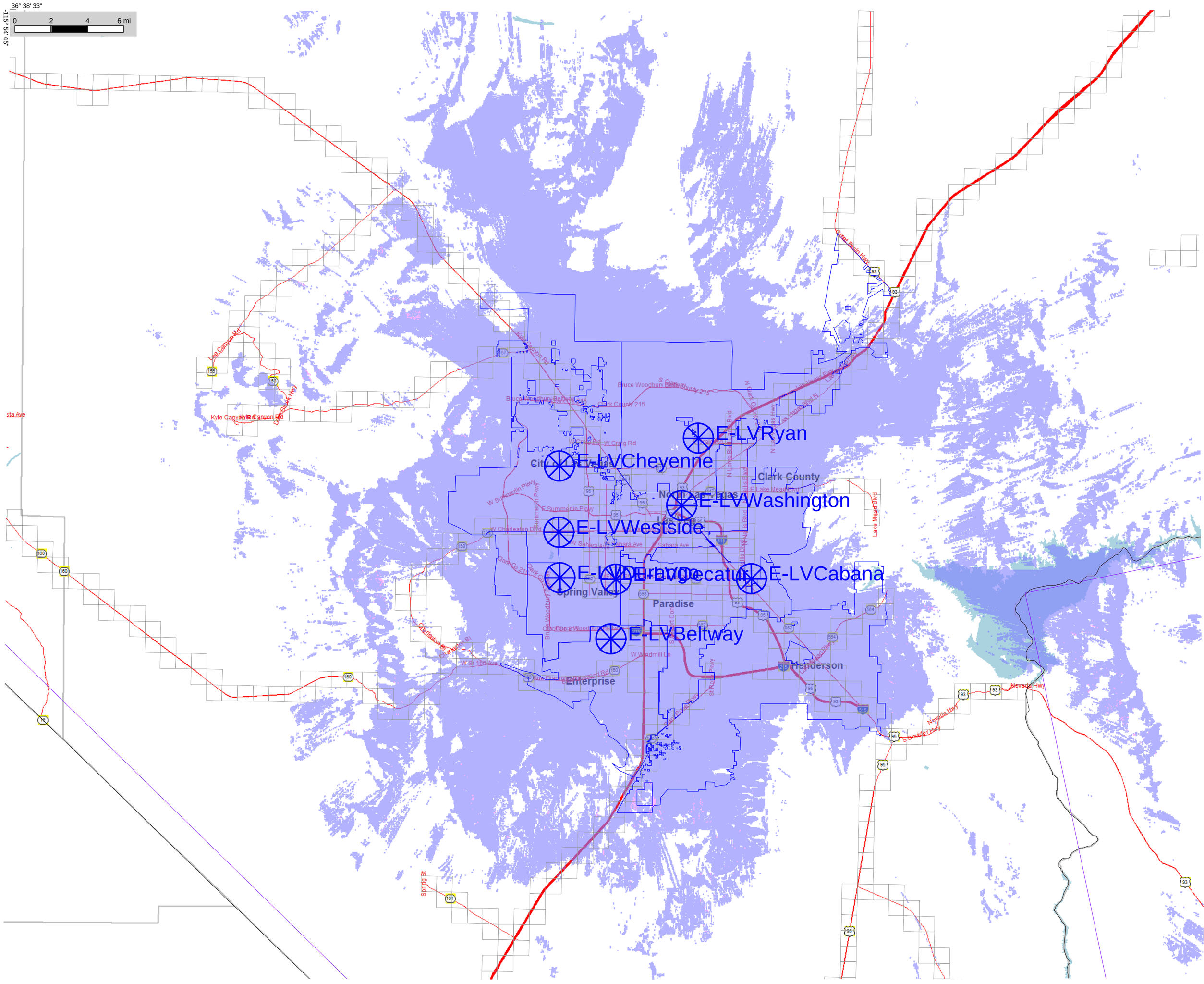
- NDOT Site
- NVE Site
- Washoe County Site



RF Integrity

RAPTR Version 29.2.440
Thursday, June 14, 2018 10:55:04
Project: NSRS RAPTR_2016
MBP: 16024
Figure: Fig. 05 NVE Las Vegas Simulcast Portable Talk Out (Downlink) DAQ 3.4 FOR INFORMATION ONLY
Engineer:
Map type - 1:295,765
Note: Map depicts coverage across the defined service area. Statistical variability does not allow for guarantee of coverage in specific locations, but does represent graphically area % coverage.

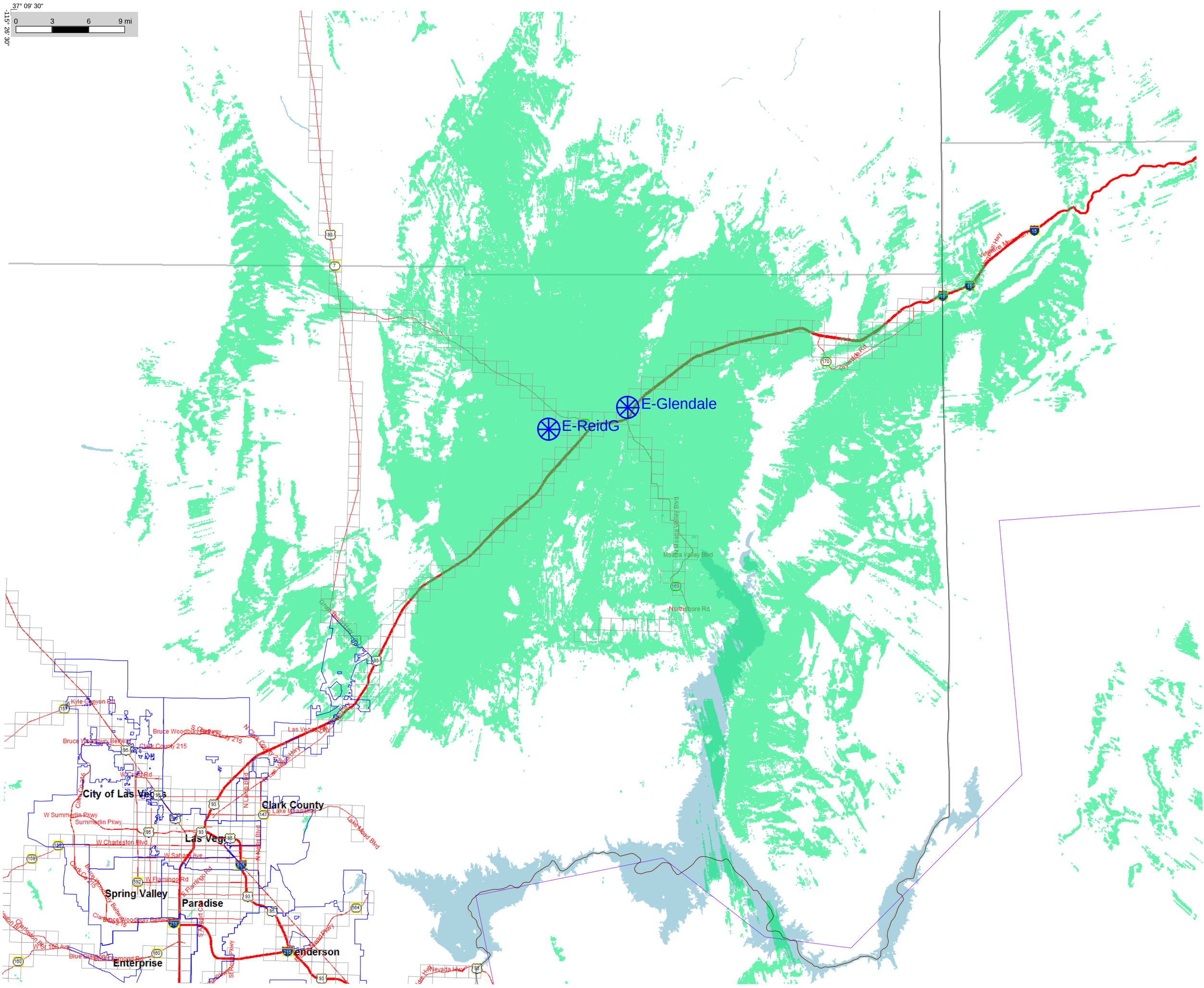
- NDOT Site
- NVE Site
- Washoe County Site



RF Integrity

RAPTR Version 29.2.440
Thursday, June 14, 2018 10:55:44
Project: NSRS RAPTR_2016
MBP: 16024
Figure: Fig. 06 NVE Glendale Reid Gardner Simulcast Portable Talk Out (Downlink) DAQ 3.4 FOR INFORMATION ONLY
Engineer:
Map type - 1:381,041
Note: Map depicts coverage across the defined service area. Statistical variability does not allow for guarantee of coverage in specific locations, but does represent graphically area % coverage.

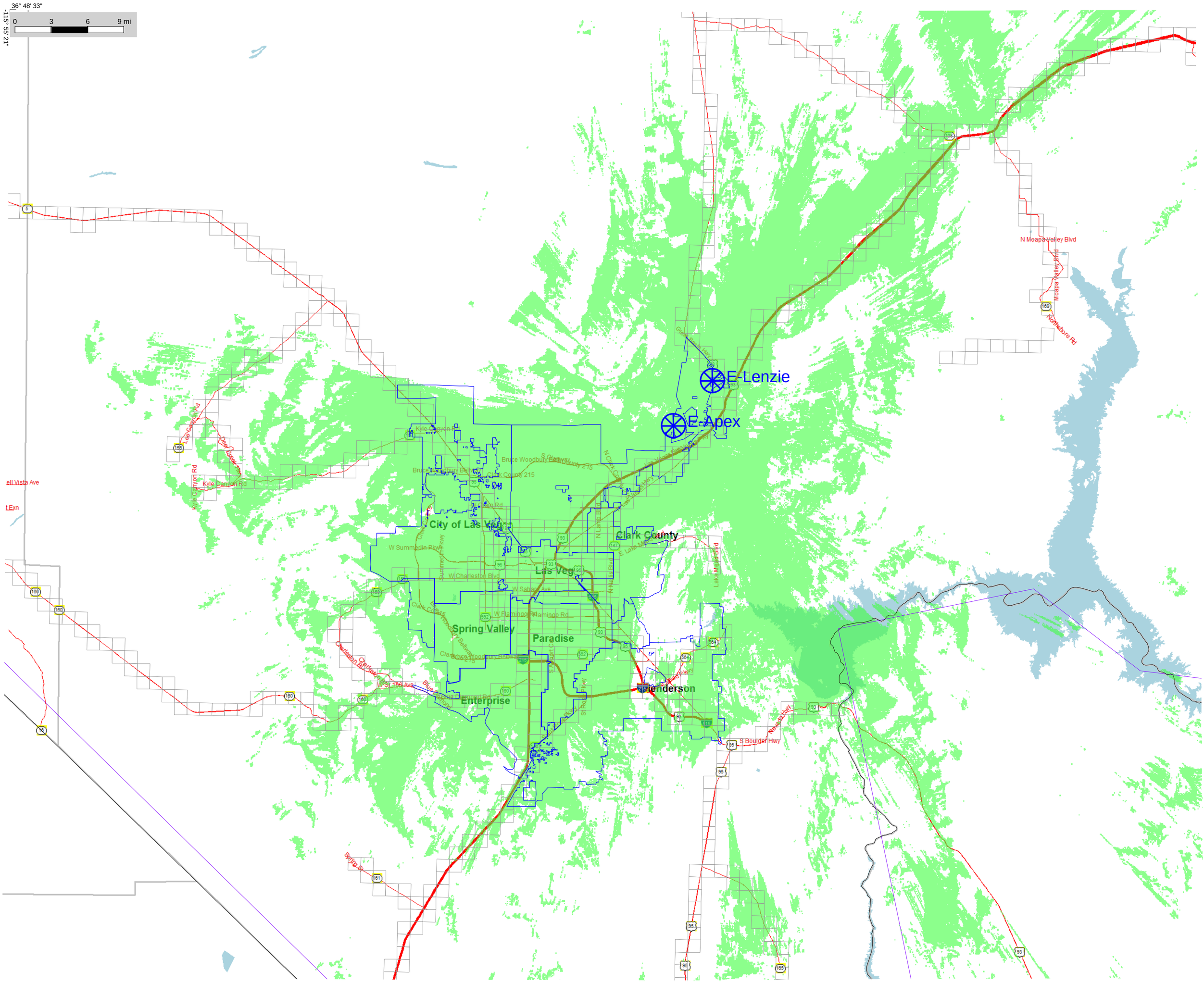
- NDOT Site
- NVE Site
- Washoe County Site



RF Integrity

RAPTR Version 29.2.440
Thursday, June 14, 2018 10:56:24
Project: NSRS RAPTR_2016
MBP: 16024
Figure: Fig. 07 NVE Lenzie Apex Simulcast Portable Talk Out (Downlink) DAQ 3.4 FOR INFORMATION ONLY
Engineer:
Map type - 1:365,189
Note: Map depicts coverage across the defined service area. Statistical variability does not allow for guarantee of coverage in specific locations, but does represent graphically area % coverage.

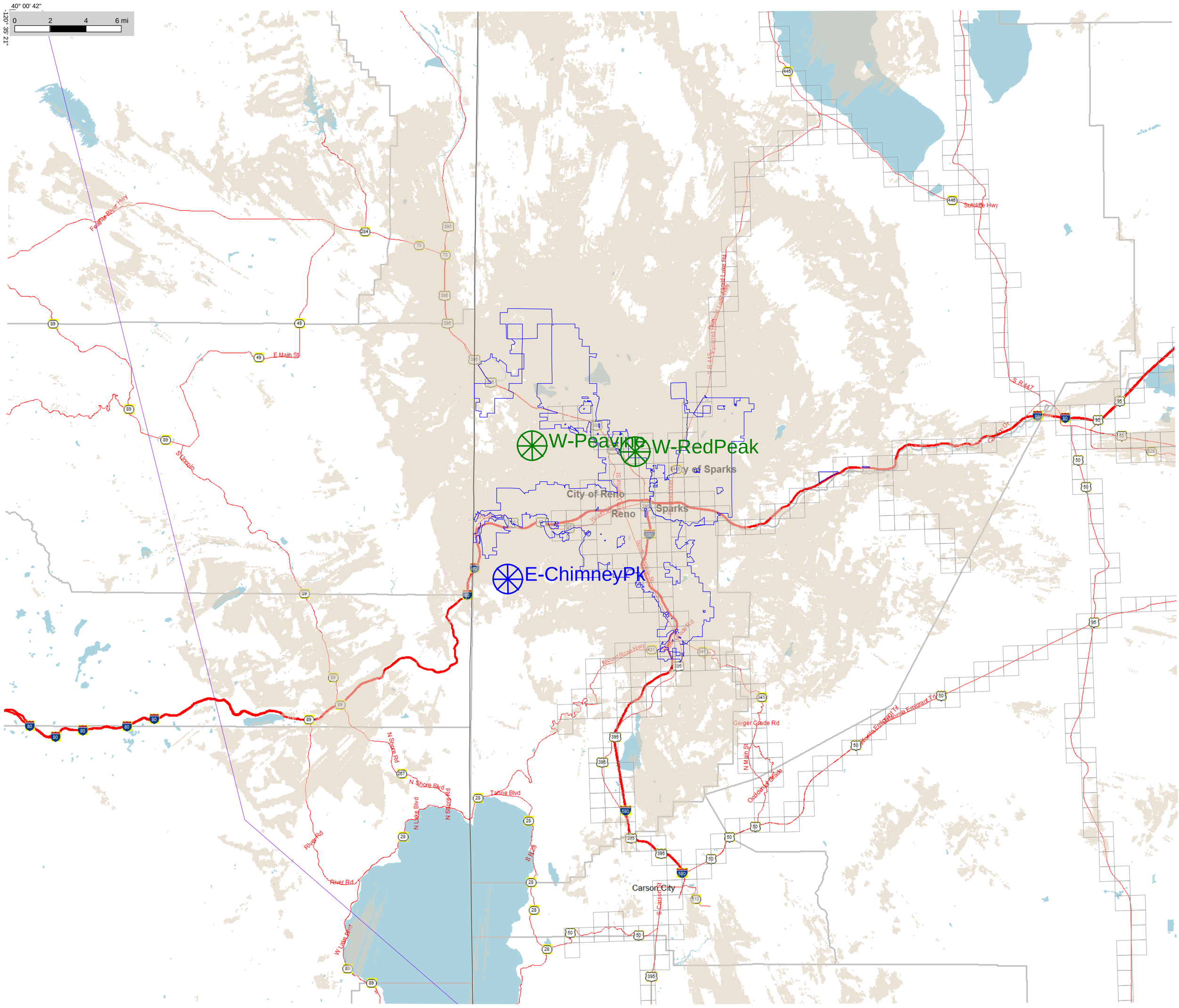
- NDOT Site
- NVE Site
- Washoe County Site



RF Integrity

RAPTR Version 29.2.440
Thursday, July 12, 2018 16:10:33
Project: NSRS RAPTR_2016
MBP: 16024
Figure: Fig. 08 Washoe Metro Chimney Pk Simulcast Portable Talk Out (Downlink) DAQ 3.4 FOR INFORMATION ONLY
Engineer:
Map type - 1:303,186
Note: Map depicts coverage across the defined service area. Statistical variability does not allow for guarantee of coverage in specific locations, but does represent graphically area % coverage.

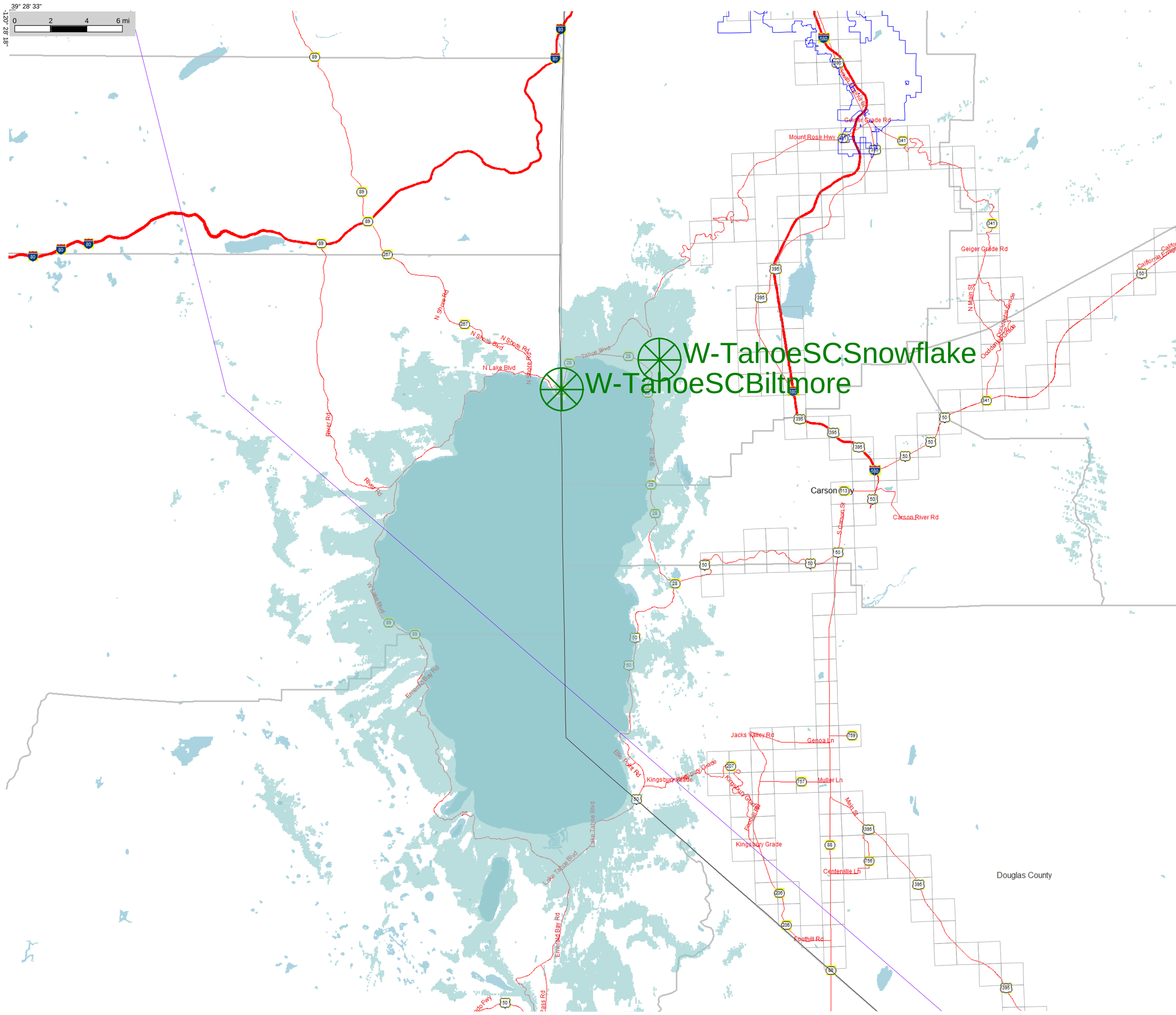
- NDOT Site
- NVE Site
- Washoe County Site



RF Integrity

RAPTR Version 29.2.440
Thursday, June 14, 2018 10:57:42
Project: NSRS RAPTR_2016
MBP: 16024
Figure: Fig. 09 WashoeTahoe Simulcast Portable Talk Out (Downlink) DAQ 3.4 FOR INFORMATION ONLY
Engineer:
Map type - 1:206,797
Note: Map depicts coverage across the defined service area. Statistical variability does not allow for guarantee of coverage in specific locations, but does represent graphically area % coverage.

- NDOT Site
- NVE Site
- Washoe County Site

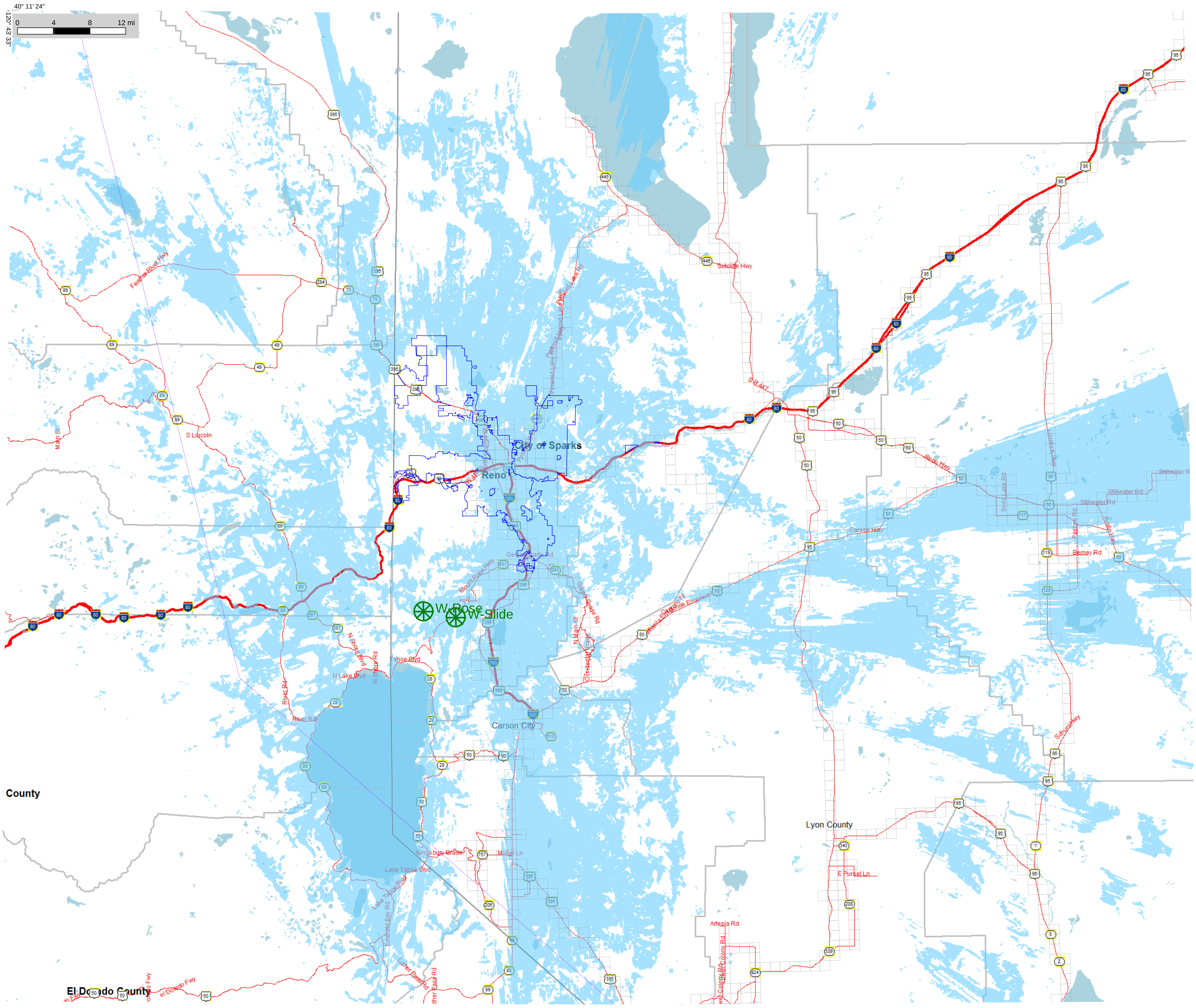


RF Integrity

RAPTR Version 29.2.440
Thursday, July 12, 2018 16:11:26
Project: NSRS RAPTR_2016
MBP: 16024
Figure: Fig. 10 Washoe Slide Rose Simulcast Portable Talk Out (Downlink) DAQ 3.4 FOR INFORMATION ONLY
Engineer:
Map type - 1:458,903
Note: Map depicts coverage across the defined service area. Statistical variability does not allow
for guarantee of coverage in specific locations, but does represent graphically area % coverage.

HARRIS®

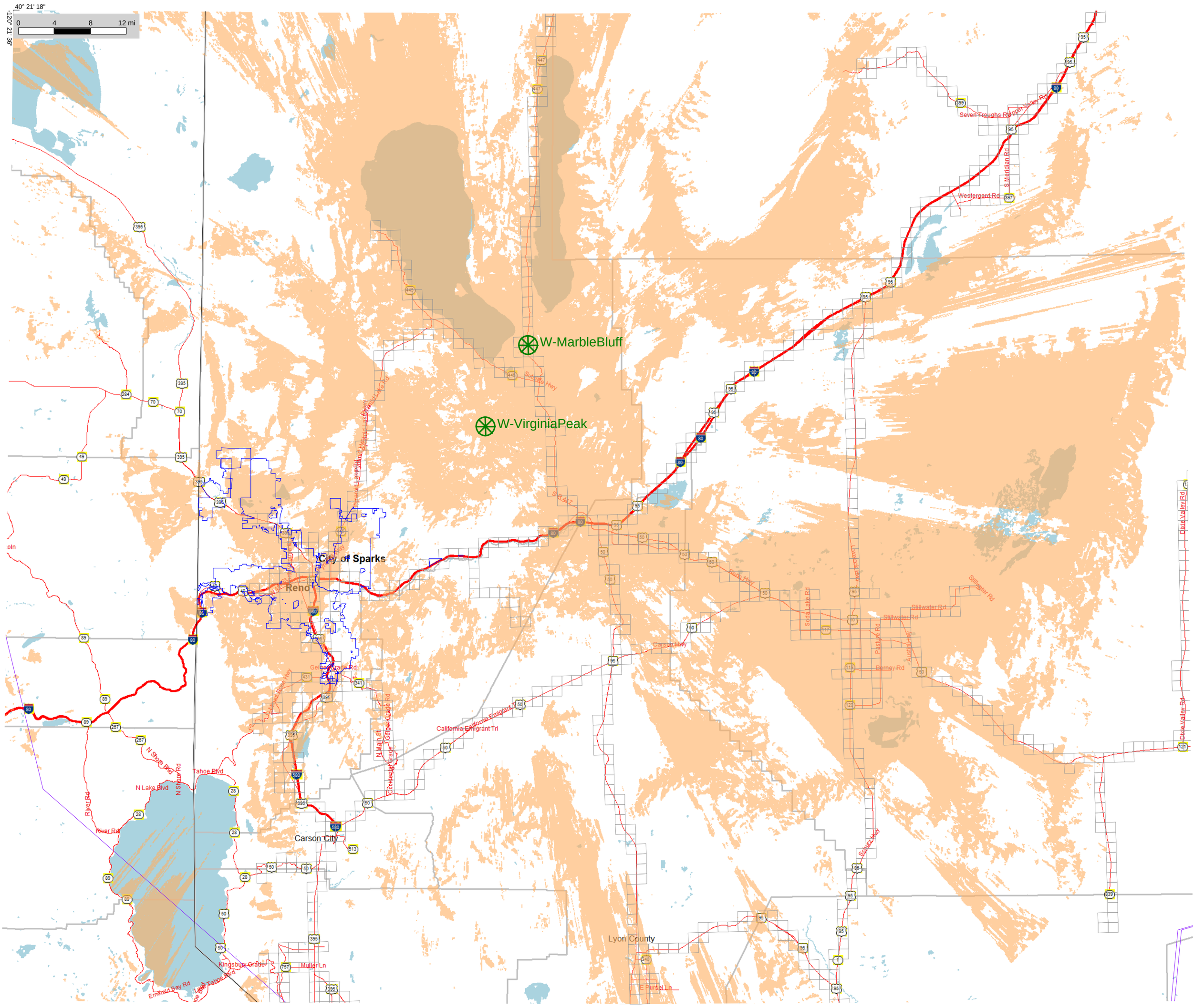
- NDOT Site
- NVE Site
- Washoe County Site



RF Integrity

RAPTR Version 29.2.440
Thursday, June 14, 2018 10:59:50
Project: NSRS RAPTR_2016
MBP: 16024
Figure: Fig. 11 Washoe Marble Virginia Simulcast Portable Talk Out (Downlink) DAQ 3.4 FOR INFORMATION ONLY
Engineer:
Map type - 1:457,845
Note: Map depicts coverage across the defined service area. Statistical variability does not allow for guarantee of coverage in specific locations, but does represent graphically area % coverage.

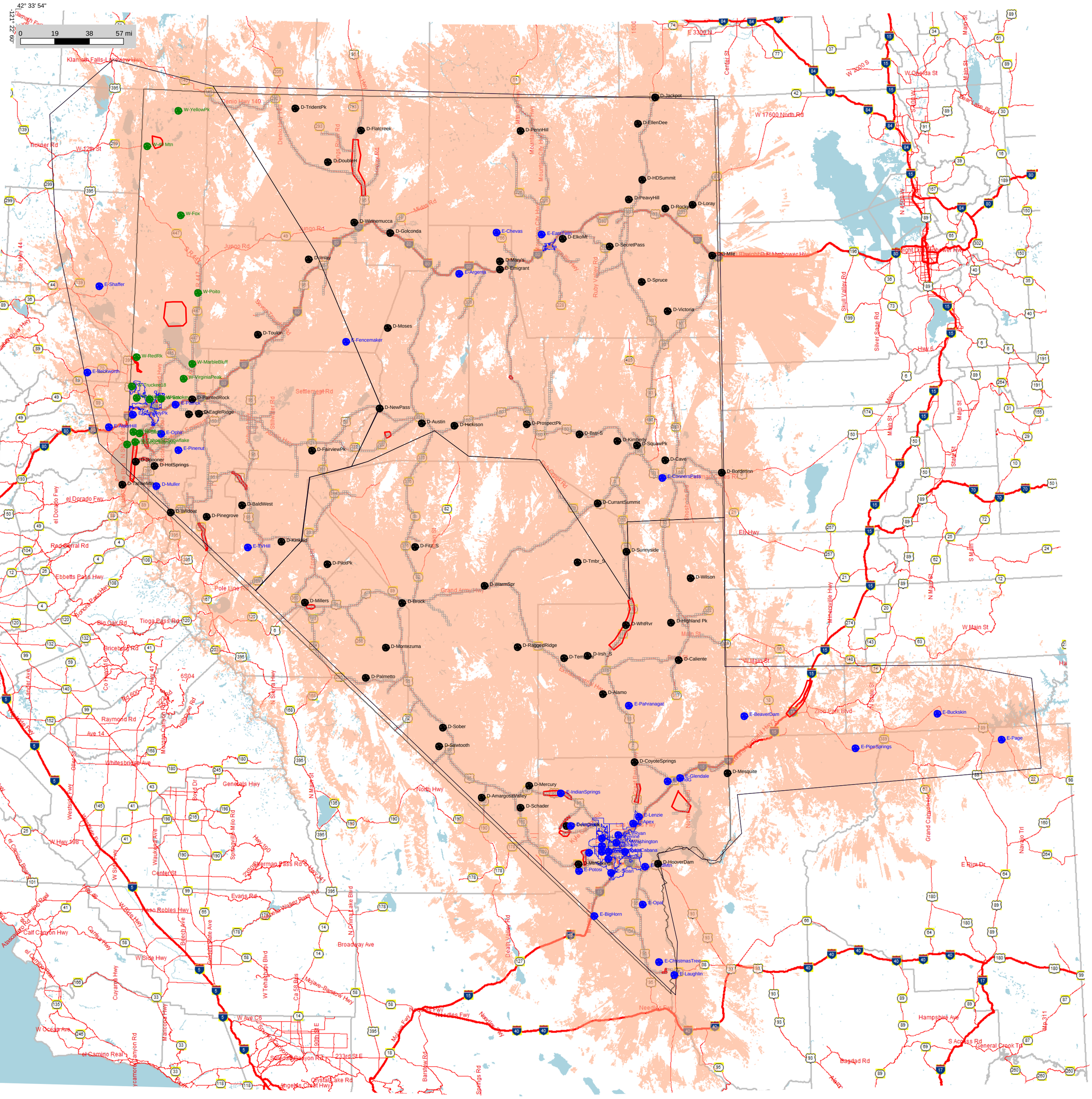
- NDOT Site
- NVE Site
- Washoe County Site



RF Integrity

RAPTR Version 29.2.440
Tuesday, August 07, 2018 17:07:44
Project: NSRS RAPTR_2016
MBP: 16024
Figure: Fig. 12 NSRS Composite 126 Sites Mobile Talk Out (Downlink) DAQ 3.4 FOR INFORMATION ONLY
Engineer:
Map type - 1:2,350,000
Note: Map depicts coverage across the defined service area. Statistical variability does not allow for guarantee of coverage in specific locations, but does represent graphically area % coverage.

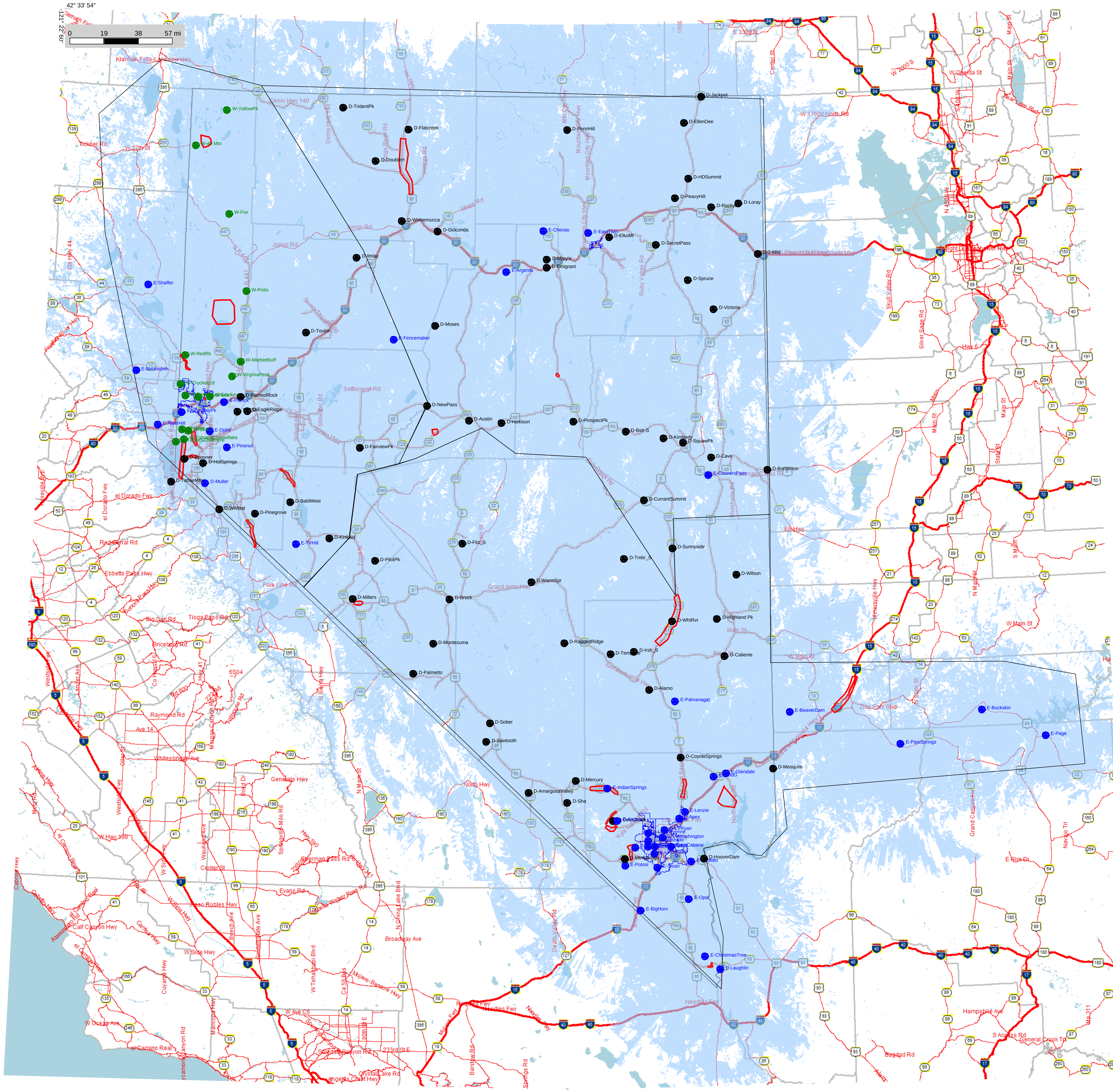
- NDOT Site
- NVE Site
- Washoe County Site



RF Integrity

RAPTR Version 29.2.440
Tuesday, August 07, 2018 17:32:01
Project: NSRS RAPTR_2016
MBP: 16024
Figure: Fig. 13 NSRS Composite 126 Sites Mobile Talk Back (Uplink) DAQ 3.4 FOR INFORMATION ONLY
Engineer:
Map type - 1:2,350,000
Note: Map depicts coverage across the defined service area. Statistical variability does not allow for guarantee of coverage in specific locations, but does represent graphically area % coverage.

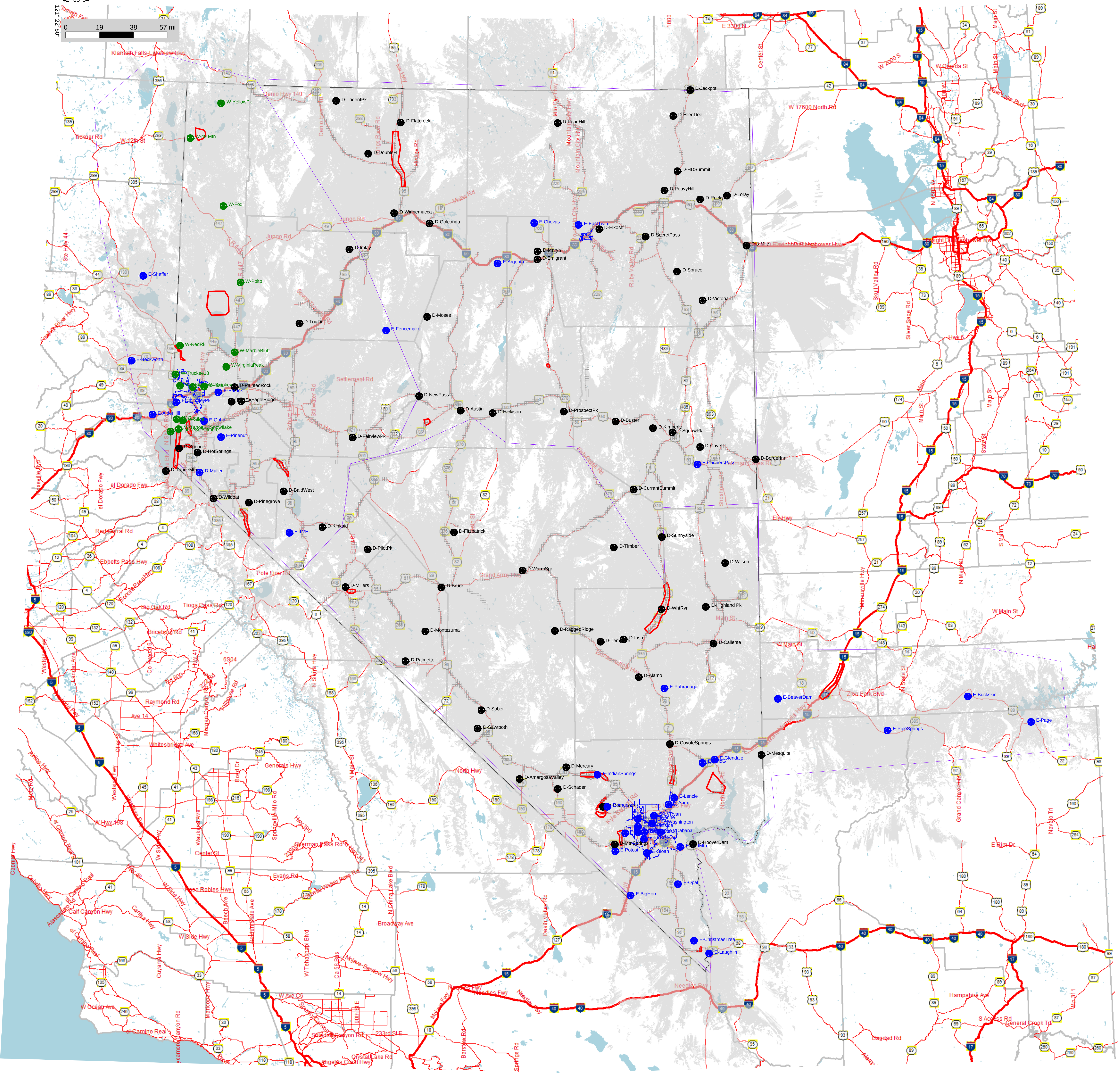
- NDOT Site
- NVE Site
- Washoe County Site



RF Integrity

RAPTR Version 29.2.440
Wednesday, August 08, 2018 16:47:51
Project: NSRS RAPTR_2016
MBP: 16024
Figure: Fig. 14 NSRS Composite 127 Sites Portable Talk Out (Downlink) DAQ 3.0 FOR INFORMATION ONLY
Engineer:
Map type - 1:2,350,000
Note: Map depicts coverage across the defined service area. Statistical variability does not allow for guarantee of coverage in specific locations, but does represent graphically area % coverage.

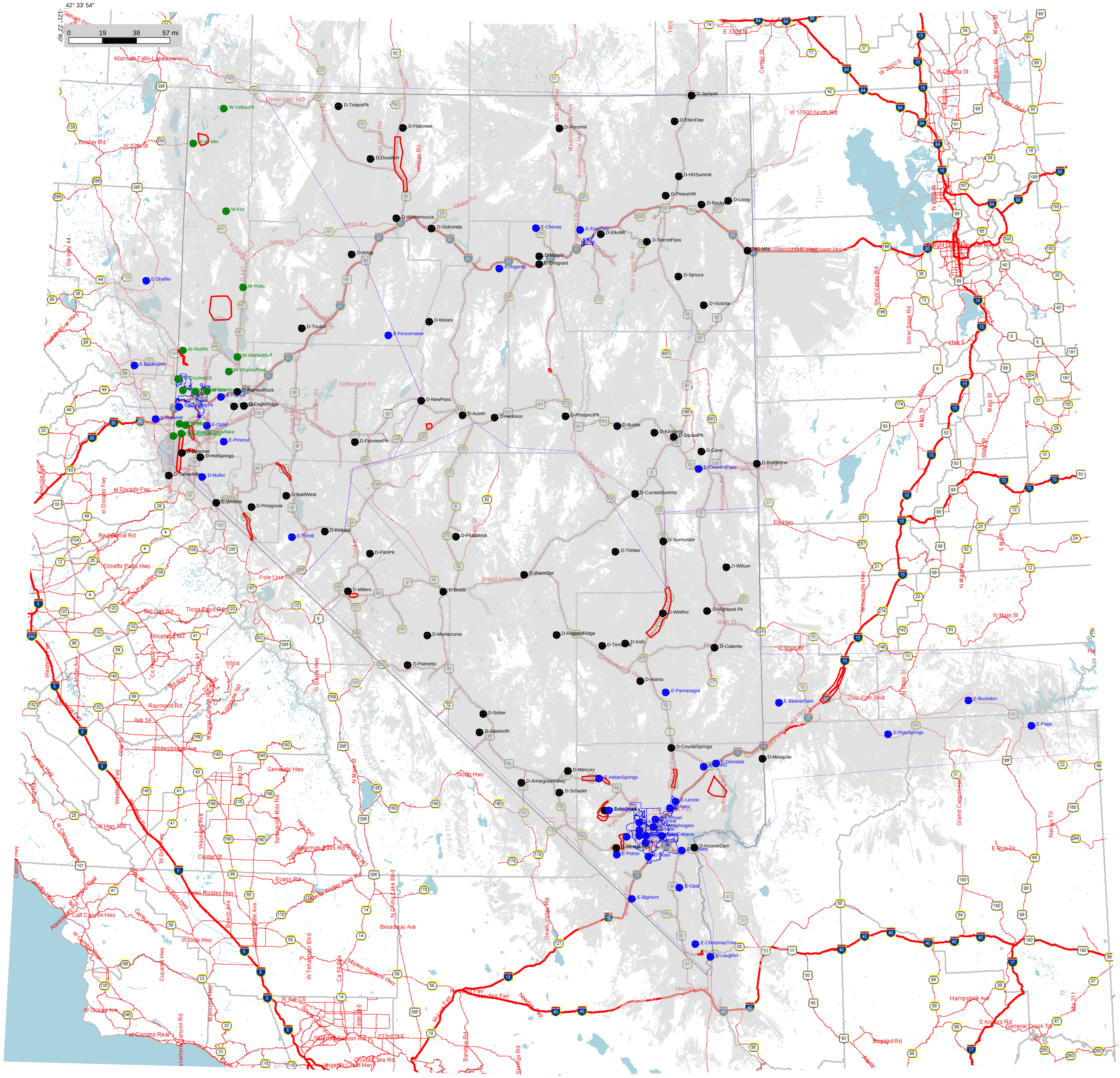
- NDOT Site
- NVE Site
- Washoe County Site

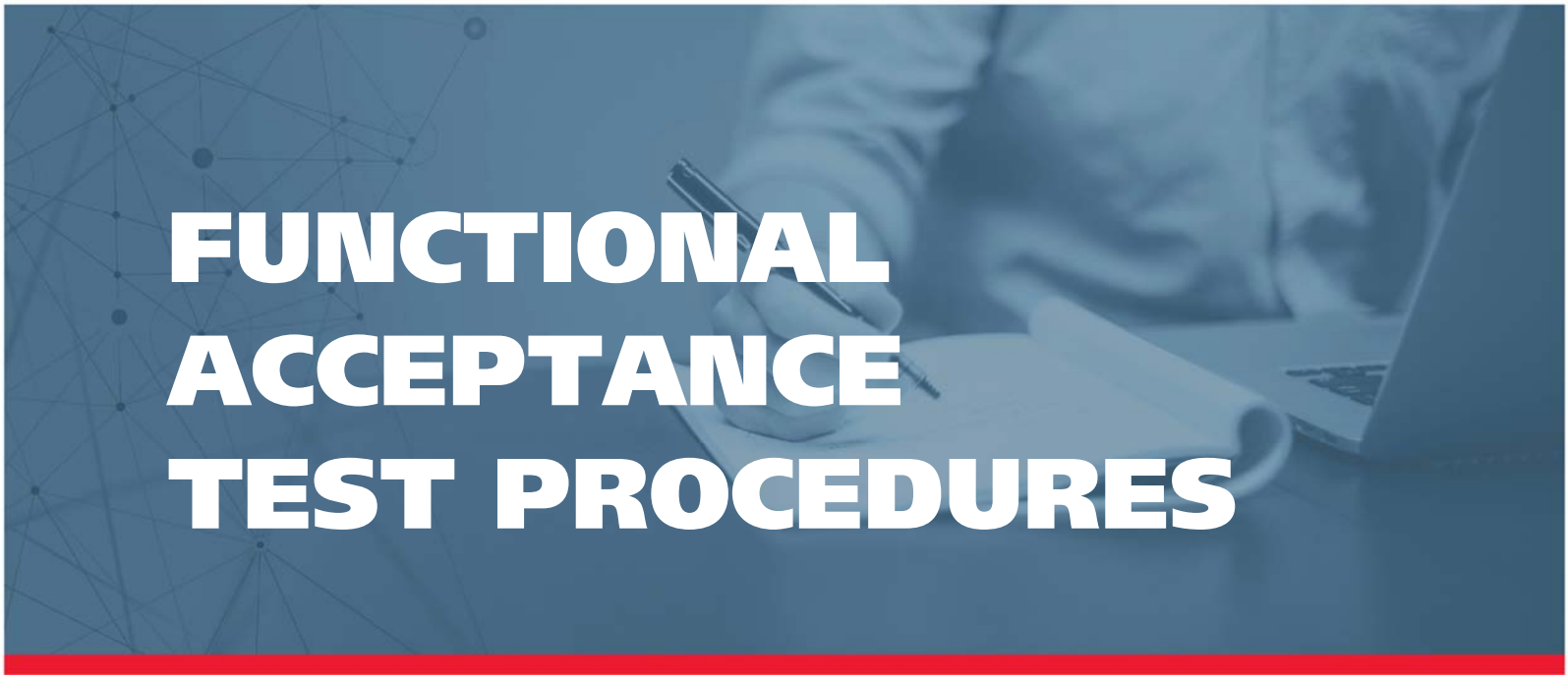


RF Integrity

RAPTR Version 29.2.440
Wednesday, August 08, 2018 17:10:44
Project: NSRS RAPTR_2016
MBP: 16024
Figure: Fig. 15 NSRS Composite 127 Sites Portable Talk Back (Uplink) DAQ 3.0 FOR INFORMATION ONLY
Engineer:
Map type - 1:2,350,000
Note: Map depicts coverage across the defined service area. Statistical variability does not allow for guarantee of coverage in specific locations, but does represent graphically area % coverage.

- NDOT Site
- NVE Site
- Washoe County Site





FUNCTIONAL ACCEPTANCE TEST PROCEDURES

ABOUT THIS DOCUMENT

This document was specifically prepared for the customer shown below for the SR10A.4 System. Each section of this document is individually maintained in the Harris document control system.

Customer: Washoe County, NV

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DOCUMENT USAGE

Many of the tests in this document will need to be run on multiple pieces of equipment. For tests that need to be run multiple times, log in the comment section of the result box the identifier of the equipment tested. Although specific tests are not included relating to electrical measurements or timing parameters of equipment, these tests and levels are conducted and recorded as part of Harris' standard production and/or installation practices. These parameters include but are not limited to:

- Transmit Frequency and Deviation
- Output and Reflected Power
- Receiver Sensitivity
- Receiver Multicoupler Gain (if applicable)
- Receiver Preamplifier Gain (if applicable)
- Combiner Loss (if applicable)
- Audio line out
- Audio line in

SUBSCRIBER UNIT USAGE

All tests for subscriber (terminal) units in this document will be performed with Harris subscriber units unless the test setup identifies another Vendor's subscriber unit to be used.

1. CUSTOMER APPROVAL

These Test Procedures have been read and approved for use as the Functional System Acceptance Test.

Customer Representative	**Harris Corporation Representative**
Signature and Date	Signature and Date
Printed name and title	Printed name and title

2. SYSTEM ACCEPTANCE

This Acceptance Test Procedure has been fully and successfully completed with all action items resolved.

Customer Representative	**Harris Corporation Representative**
Signature	Signature
Printed name and title	Printed name and title
Date	Date

FUNCTIONAL TESTING CLARIFICATION

Equipment inspection and testing in addition to staging acceptance testing is performed at the Harris staging facility. Staging tests as detailed in this matrix verify basic equipment functionality in addition to its functionality as part of an overall system. Equipment as received from Harris and third-party manufacturing suppliers is supplied with manufacturer test results, as applicable. Test results documentation will be that from the staging functional acceptance tests. Equipment tests will be performed in the field after installation both as part of equipment commissioning and overall final functional acceptance testing. Test results documentation will be from the final functional acceptance tests.

3. Facility Test [Field Tests]

3.1 Visual Inspection [Field Tests]

Purpose: **Verify the system has been installed following Harris installation standards.**

Expected Results: **The installation should look clean and the documentation should reflect the installation.**

Setup:

None

Execution:

- ☐ Verify the area is clean and that all cabinets and racks are both clear of debris and clean.
- ☐ Verify all equipment racks are spaced per the drawings, secured and grounded.
- ☐ Verify all nameplates and labels are in place.
- ☐ Verify all protective foam, tape, and packing material has been removed.
- ☐ Verify all punchblocks are labeled.

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

3.2 Power Backup / UPS Verification [Field Tests]

Purpose: **To verify that the site can run on the UPS without interruptions.**

Expected Results: **Radio communication should not be interrupted during the transition.**

Setup: **Prior to the execution of this test, ensure any computers or other devices with volatile memory are backed up or are on power circuits not affected by this test.**

Notes: **Harris will perform this test at all locations. Harris is not responsible for test failures due to inadequate backup power equipment that is under the county's responsibility to provide. Any such failures of county provided backup power equipment will not delay system acceptance. Record in the comments section the names of locations tested and who has provided the backup power equipment (Harris or the county).**

Execution:

1. From the facility circuit breaker panel, disconnect main power.
   - ☐ Verify communication is uninterrupted.
2. After predetermined extent of designed backup power, reapply power.
   - ☐ Verify communication is uninterrupted.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

4. VIDA UNIVERSAL ADMINISTRATION SERVER (UAS)

4.1 Create an Agency Level Administrator Account in the UAS

Purpose: **Demonstrate the capability to create Agency Admin Accounts in the UAS.**

Expected Results: **This test will create a new Agency Level Administrator account.**

Setup: **Need system level access to an UAS or UAS Client. Predefined Agency and Region in the UAS.**

Execution:

1. Browse to the UAS at the address of 'https://s0u1uas.vida.local:8443/nas'

2. Log in with UAS administrator level account.
   - Verify that default accounts are created (see list below) and verify a default Agency administrative class, by selecting System/Administration/Admin User.

3. Select "Add" to display the Administration User Detail screen.

4. Enter a name (e.g., TestAgency), description, and password. Select save to download and click 'OK'.

5. Log out of the default account.

6. Log in with the newTestAgencyAdmin. Verify access to account.
   - Verify access to account.

7. Log out of the Test AgencyAdmin.

8. Log in with the default account and delete the TestAgencyAdmin.

Admin User	Admin Class	Description
agency998	Agency998	Agency 998 Access
Vida	RSA	RSA
ProvTool	RSA	Provtool
vida2	RSA	vida2
Hp	RSA	Hao for Testing
Provtool2	RSA	Provtool
Provtool3	RSA	Provtool
Provtool4	RSA	Provtool
Kc	RSA	Kc

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

4.2 Provision Agency with Talk Groups and Subscriber Units in the UAS

Purpose: **Demonstrate the capability to add talk-groups and users to the Agency accounts in the UAS.**

Expected Results: **This test will show that a user can add a new talk group and users to the system.**

Setup: **System/Region/Agency level access to the UAS or a UAS client.**

Talk Groups				
Name	Description	SPNI	Property Id	Priority Id
64000ALL	TG64000 P25	Full Rate All Call	1	3
64100ALL	TG64100 P25	Full Rate All Call	1	3
64101TCL	TG64101 P25	Full Rate Conf Med Priority	1	4
64102TCM	TG64102 P25	Full Rate Conf Med Priority	1	4
64103TCM	TG64103 P25	Full Rate Conf Med Priority	1	4
64104TCM	TG64104 P25	Full Rate Conf Med Priority	1	4
64105TCM	TG64105 P25	Full Rate Conf Med Priority	1	4
64106TCH	TG64106 P25	P25 Full Rate Conf High Priority	1	4

Radios						
Description	RSI	Protocol Mask	Status	Sub Type	Assigned End User	Algorithm Support
Radio1	9980001	P25	Enabled Unit	Harris P5400	010:998:0001	AES
Radio2	9980002	P25	Enabled Unit	Harris P5400	010:998:0002	AES
Radio3	9980003	P25	Enabled Unit	Harris XG-75 Portable	010:998:0003	AES
Radio4	9980004	P25	Enabled Unit	Harris XG-75 Portable	010:998:0004	AES
Console9101	9989101	P25	Enabled Unit	Maestro Console	010:998:9101	AES
Radio5	9980005	P25	Enabled Unit	Harris XG-75 Portable	010:998:0005	AES
Radio6	9980006	P25	Enabled Unit	Harris XG-75 Portable	010:998:0006	AES

Radio7	9980007	P25	Enabled Unit	Harris XG-75 Portable	010:998:0007	AES
Radio8	9980008	P25	Enabled Unit	Harris XG-75 Portable	010:998:0008	AES
Radio9	9980009	P25	Enabled Unit	Harris XG-75 Portable	010:998:0009	AES
Radio10	9980010	P25	Enabled Unit	Harris XG-75 Portable	010:998:0010	AES

Execution:

1. Log into the UAS with one of the default accounts.

2. Under Agency 998, create a talk group by select ‘R/W Talk Group’, select Agency/ “agency name”/ R/W Talk Group.

3. Click ‘Add’ and then on the Talkgroup Detail screen input the TG ID in the table below. All setting not listed use auto setting for setting not listed. Click OK and download.
   - Verify the talk group has been added to the list of Talkgroups

4. Using Putty on an SMT, log into a traffic controller at each control point for simulcast and each site for multisite and issue the command ‘show gdb’
   - Verify that group 64454 exits in the traffic controller user data base.

5. Once the group has been verified, delete it from the UAS.

TG Id	Name	Description	SPNI	Property Id
64454	64454ANA	Half Rate Low Priority	1	3

Priority Id	Coverage	Valid Coverage
5	P25Sites_PSAPs	P25Sites_PSAPs

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

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_____

4.3 Dynamic Regroup from the UAS

Purpose: **Demonstrate the ability to dynamically regroup Subscriber units from the UAS.**

Expected Results: **This test will combine selected talk groups into a single interop group.**

Setup: **Radios must have "Allow P25T Unsolicited Dynamic Regroup" checked in the radio personality under General Options.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	9980001	TG64051 P25	64001
Radio 2	9980002	TG64052 P25	64002
Radio 3	9980003	TG64053 P25	64003

Execution:

1. At the UAS, select 'Regroup' tab and 'Regroup Profile'.

2. Click 'Add' to add profile detail; name Group 'Regroup1', and Description 'Regroup1 Test'.
   - Define regroup profile; select Agency 998 and 'Talk Group 3'.
   - Select 'OK' and save changes to the UAS.

3. Click 'End User Group' and click 'Add'. Name Group 'Regroup1' and Description 'Regroup1 test'.
   - Select Agency 998 from 'Select a Scope' drop down box.
   - Add 'Radio 1' and 'Radio 2' to the 'Selected' windows.
   - Select 'OK' to close 'End User Group Detail'.
   - Click 'Save' button to Download the new regroup.

4. Click 'Define Regroup' and click 'Add' to name the Regroup 'Regroup1' and Description 'Regroup1 test'.
   - Change 'Profile Name' to 'Regroup1' and change 'End User Group Id' to 'Regroup1'.
   - Click 'OK' and save to click 'Save' the changes to the UAS.

5. Click 'Manage Regroup' check the box for 'Regroup1' and select the button for 'Regroup'.
   - Click 'Save' to start Regroup.
   - Verify that Radio 1 and Radio 2 are forced to 'Talk Group 3'.

6. At 'Radio 1' and 'Radio 2', attempt to change talk groups away from 'Talk Group 3'
   - Verify that both radios are forced to remain on 'Talk Group 3'.

7. PTT 'Radio 1' on 'Talk Group 3'.
   - Verify that 'Radio 3' hears audio on 'Talk Group 3' and can respond.

8. Clear the dynamic regroup from the UAS client.
   - ☐ Verify ‘Radio 1’ and ‘Radio 2’ are no longer forced to ‘Talk Group 3’ (i.e., they can select other predefined Talk-Groups).

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

4.4 Unit Deregistration

Purpose: **Demonstrate that radio will automatically deregister when the radio is turned off.**

Expected Results: **This test will show that radio that is off will not create traffic load demand.**

Setup: **Radio 1 is only radio on 'Talk Group A' for this test.**
All other radios should be on different talk groups.

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	9980001	TG64001 P25	64001
Console	9989101	TG64001 P25	64001

Execution:

1. On a client computer, open the windows internet explorer and browse to https://s0u1rnm.vida.local/nmc. Choose System Map and select 'Launch Application' button. Open Realtime tab and Click Mobiles.
   - ☐ Verify 'Radio 1' LID is shown registered on the site.

2. PTT 'Console' on TG 64001 and verify it communicates on the system to 'Radio 1'.
   - ☐ Return call from 'Radio 1' to 'Console' on TG 64001.

3. Turn off 'Radio 1' and wait for expiration of the radio timeout period.

4. Refresh RNM Mobiles screen periodically and verify Radio 1 deregistered after VNIC Remove Demand Timer has passed.

5. PTT 'Console' on TG 64001, after the expiration of the timeout.
   - ☐ Verify no channel is assigned to site, since no demand exists at the sites.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

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4.5 UAS Site Adjacency Configuration

Purpose: **Demonstrate the capability to configure site adjacencies in the UAS.**

Expected Results: **Site adjacencies will be successfully configured and modified.**

Setup: **UAS installed and functioning on System network.**

Execution: Basic test is to follow the manual and SRN instructions to configure site adjacencies using the new graphical interface.

1. In the UAS go to System > System Properties > Site adjacency.
2. Select a site on the left side to configure for adjacency information.
3. Use the left-hand side to add adjacencies for the site.
   - ☐ Confirm the adjacent sites are removed from the non-adjacent site list and display correctly on the right side.
4. Use the right-hand side to remove a site adjacency.
   - ☐ Confirm the removed adjacency disappears on the right side and is displayed as a non-adjacent site on the left side.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

4.6 Unit Enable/Disable from the UAS

Purpose: **Demonstrate the ability to disable a lost/stolen radio from the UAS.**

Expected Results: **This test will disable & re-enable a designated radio.**

Setup: **Obtain 2 radios switched to the same group and note the IDs. Switch on the radios and ensure that they communicate. Verify all sites are connected to the NSC, and that all sites are online.**

[Note: If a radio is encrypted, Unit Disable will automatically delete the encryption key from the radio, as it is disabled. To restore unit functionality for an encrypted radio, the radio must have the encryption key re-installed**.]**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64001 P25	64001
Radio 4	998005	TG64001 P25	64001

Execution:

1. In the UAS Select TG 64001 on Radios 1, 2, and 4.
   - ☐ Verify that the radios can communicate.

2. From the UAS:
   - ☐ Click Radio 4 ENABLE/DISABLE.
   - ☐ Under the UNIT Enable/Disable tab, enter the ID of radio 4 to be modified.
   - ☐ Select the DISABLE button and check the status.
   - ☐ Attempt to PTT Radio 4 and verify that it will not communicate with the other encrypted radios
   - ☐ PTT Radio 1 and verify that Radio 4 cannot receive the call.

3. Enable the ID of Radio 4.
   - ☐ Verify that the Enable/Disable screen indicates that the Current State of the radio is Enabled.
   - ☐ Confirm that the radios can communicate in unencrypted mode.

4. Switch off Radio 4 and disable it from the Enable/Disable screen.
   - ☐ Switch on the radio and verify that, on logging into the site, it becomes disabled.
   - ☐ Verify that the State settings change to Disabled and that the radios cannot communicate.

5. Enable Radio 4.
   - ☐ Verify that radios can communicate in unencrypted mode.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

5. OVER THE AIR REKEYING (OTAR)

5.1 Generating a system UKEK

Purpose: **This test is setup to verify the KMFs ability to create a UKEK.**

Expected Results: **The KMF will create a UKEK.**

Setup: **This test requires a computer that is on the IP network and has 'Harris Key Manager' installed and running.**

1. Log into the KMF with the administrator level Active Directory Account
2. Open the 'Network KMF Management'
3. Select the UKEK tab
4. Change the 'Save As' text field to '\\fileshare\fileshare\kmf_files\ProvisionFile.ukek'
5. Generate the UKEK file by selecting the 'Export UKEK' button
6. Select the 'SLN Bindings' tab
7. Change the 'Save As' text field to '\\fileshare\fileshare\kmf_files\SlnBindingsReport/xml'
8. Generate the bindings by selecting 'Generate SLN Bindings Report'. This file will be used in a later test.

(Pass/Fail) _____ Tester: _____

Date: _____ Comments: _____

5.2 UKEK a Radio

Purpose: **This test is setup to verify the KMFs ability to load UKEKs into a radio.**

Expected Results: **The radio should accept the UKEK file developed by the KMF.**

Setup: **This test requires a computer that is on the IP network and has 'Harris Key Manager' installed and running. This test also requires three radios programmed with a talk group utilizing an AES encryption key. All radios should be feature encrypted and enabled for OTAR operation. Two radios should have keys and one radio should not have keys. In test "Unit Enable/Disable from the UAS" they keys were removed from radio 9980005.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64001 P25	64001
Radio 5	998005	TG64001 P25	64001

Execution:

1. On a computer with 'Harris Key Manager' installed, save the file at '\\fileshare\fileshare\kmf_files\ProvisionFile.ukek' to the local computer.
2. Start 'Harris Key Manager' and connect the radio to the local computer.
3. Select 'Tools' -> 'Key Load Wizard' to open key load wizard
4. Select 'Next' -> Load a UKEK file into one or more devices" and open the UKEK file in step 1 and select 'Next'
5. Once the UKEKs are loaded select 'Next'
6. Choose the com port
7. Power on the radio and put the radio into Key Load Mode
8. Select 'Load' to load UKEK into the radio

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

5.3 Warm starting a radio from the UAS Key Management Application

Purpose: **This will test the system's ability to push encryption keys to a radio and the radio to hear other radios on the encrypted talk group.**

Expected Results: **The radio will accept the keys from the system and be able to communicate with other encrypted radios on an encrypted talk group.**

Setup: **This test requires three radios programmed with a talkgroup utilizing an AES encryption key. The radios and talkgroup need to be in a test crypto net in the UAS Key Management Application. The radios should be both feature encrypted and enabled for OTAR operation. Two radios should have working encryption, and Radio 4 should have the ukek load but no keys.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64001 P25	64001
Radio 5	998005	TG64001 P25	64001

Execution

1. PTT all three radios
   - Radios 1 and 2 should communicate normally
   - Radio 1 and 2 should hear calls from radio 5 but radio 5 should not be able to hear calls from the encrypted radios

2. From the UAS, warm start radios 5.
   - The UAS will report "Warm Starting".

3. After the operation is complete, refresh the UAS screen.
   - Verify the UAS reports "Warm Started Success" for radios 5

4. Again, PTT radio 1 on the encrypted talk group and talk.
   - Radio 1's transmit (TX) indicator should turn on and be amber.
   - Verify that radio 1 and 2 now decrypt the call's audio.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

5.4 Rekeying and Changing Over a Crypto Net from the UAS

Purpose: **This test will show that the system can change the encryption keys to a new set of keys.**

Expected Results: **After this test is complete the radio will be able to communicate with the new set of keys sent by the system**

Setup: **This test requires three radios programmed with a talk group utilizing an AES encryption key. The radios and talk group need to be in a test crypto net in the UAS Key Management Application. All radios should be feature encrypted and enabled for OTAR operation. The radios should have been warm started previously. If a console and/or GWB are present in the system, then these devices should be included in this test also. They need to be in the same test crypto net as the radios and be programmed with the test talk group. They should have been warm started previously.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64001 P25	64001
Radio 5	998005	TG64001 P25	64001

Execution:

1. Put radios 1, 2 and 5 on the encrypted talk group.
   - Verify that all 3 radios can transmit and receive on the encrypted talk group.
2. Leave radios 1 and 2 powered on and power off Radio 5.
3. From the UAS, rekey the crypto net. The UAS will report “Rekeying” for the crypto net.
4. Select the report icon for the crypto net.
   - Radios 1 and 2 should be shown as “Rekeyed.”
   - Any consoles and/or GWB’s should also be shown as “Rekeyed.”
   - Radio 5 should be shown as “Rekey Failed.”
5. From the UAS, change over the crypto net. It should report “Changing Over” for the crypto net.

6. After the operation is complete, refresh the UAS screen. It should report “Changing Over Complete” for the crypto net

7. Turn on Radio 3. PTT radio 1 on the encrypted talk group and talk. The transmit (TX) indicator should turn on and be amber at radio 1.

   - ☐ Verify that radio 2 but not 3 decrypt the call’s audio.
   - ☐ Verify that any consoles and/or GWB’s decrypt the call’s audio also.

8. PTT Radio 3 on the encrypted talk group and talk.

   - ☐ The transmit (TX) indicator should turn on and be amber at Radio 3.
   - ☐ Verify that radios 1 and 2 decrypt the call’s audio.
   - ☐ Verify that any consoles and/or GWB’s decrypt the call’s audio.

9. From the UAS, do an end user level rekey on Radio 3 for that crypto net.

   - ☐ The UAS will report “Rekeying” for Radio 3.

10. After the operation is complete, refresh the UAS screen. It should now show “Rekeyed” for Radio 3.

    - ☐ Select the report icon for the crypto net. Radios 1, 2, and 3 will be shown as “Rekeyed.”
    - ☐ From the UAS, do an end user change over on Radio 3 for the test crypto net. The UAS will report “Changing Over” for Radio 3.

11. Again, PTT radio 1 on the encrypted talk group and talk.

    - ☐ Verify that Radio 1’s transmit (TX) indicator turns amber.
    - ☐ Verify that radio 2 and 3 decrypt the call’s audio.
    - ☐ Verify that any consoles and/or GWB’s decrypt the call’s audio also.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

5.5 Zeroizing a Radio from the UAS Key Management Application

Purpose: **This test will verify the system's ability to delete the keys out of a radio that was encrypted.**

Expected Results: **The test will take a radio that has keys and can communicate with other encrypted radios and remove the keys, so the radio cannot communicate with other encrypted radios.**

Setup: **This test requires three radios programmed with a talk group utilizing an AES encryption key. The radios and talk group need to be in a test crypto net in the UAS Key Management Application. All radios should be feature encrypted and enabled for OTAR operation. The radios should have been warm started previously.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64001 P25	64001
Radio 5	998005	TG64001 P25	64001

Execution:

1. Put radios 1, 2 and 3 on the encrypted talk group.
   - ☐ Verify that all 3 radios can transmit and receive on the encrypted talk group.
2. From the UAS, zeroize Radio 3.
   - ☐ The UAS will report "Zeroizing" for Radio 3 with the date and time updating to reflect the date and time the operation was initiated.
   - ☐ After the operation is complete, refresh the UAS screen. Verify the UAS reports "Zeroized" for Radio 3.
3. PTT radio 1 on the encrypted talk group and talk.
   - ☐ The transmit (TX) indicator should turn on and be amber at radio 1.
   - ☐ Verify that radio 2 decrypts the call's audio.
   - ☐ Radio 3 should hear garbled audio or muted audio.
   - ☐ Verify the receive indicator is amber on both radios and the ID of radio 1 should be seen at both radios 2 and 3.
   - ☐ Verify Radio 3 shows "No Key 0" when it is PTT'ed on the encrypted talk group.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

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5.6 Rekey A Radio From the Radio

Purpose: **This test will test the system's ability to send keys to a radio when the radio requests the keys.**

Expected Results: **The test will take a radio that has keys and can't communicate with other encrypted radios and add keys to the radio, so it can communicate with the system.**

Setup: **This test requires three radios programmed with a talk group utilizing an AES encryption key. The radios and talk group need to be in a test crypto net in the UAS Key Management Application. All radios should be feature encrypted and enabled for OTAR operation. One of the radios should be the radio that was zeroized in the previous test.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64001 P25	64001
Radio 5	998005	TG64001 P25	64001

Execution:

1. Key Radio 1 on an encrypted talk group.

   - Radio 1 should display 'No key' Radio 2, and 3 should not hear the call.

2. From the menu on Radio 1 select 'Rekey' to request new key for Radio 1.

   - Once the radio receives the encryption keys, key Radio 1 and verify Radio 2, and 3 hear the call.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

5.7 UKEK and Symphony

Purpose: **This test is setup to test the KMFs ability to make UKEK files the Symphony can use.**

Expected Results: **The Symphony should accept the UKEK file developed by the KMF.**

Setup: **This test requires three radios programmed with a talk group utilizing an AES encryption key. All radios should be feature encrypted and enabled for OTAR operation.**

Execution:

1. Start the Symphony Application
2. With an encrypted radio make a call on an encrypted talkgroup,
   - the radio with encryption should play the call,
   - the console will not because it does not have keys.
3. Start the ‘Manual Key Loader’ application.
4. Select ‘Load UKEK’
5. Select the ‘Browse’ button
6. Browse to ‘//fileshare/fileshare/KMF_Files/ProvisionFile.ukek’
7. Select the ‘Load’ button
8. Close the application by hitting the ‘Done’ button.
9. Select ‘Maestro Conductor Application’ from the lower right-hand side to the console desktop.
10. Select ‘Load Encryption’ this will bring up a window were the binding and UKEK can be loaded into the console
11. Select the button next to the ‘UKEK’ text field and select the UKEK saved in step 9.
12. Select the button next to the ‘binding’ text field and select the binding saved in step 9.
13. Close the ‘Load Encryption’ pop up.
14. With an encrypted radio make a call on an encrypted talkgroup

- the radio with encryption should play the call,
- the console will now play the call.

15. Choose the talkgroup that the radios are on and select the ‘Private’ button, this will make the console switch the talkgroup to encrypted mode, the console will display ‘PVT’ on the talkgroup button.

16. PTT the console the call should be heard on the encrypted radios.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

5.8 Warm Starting a Symphony from the UAS Key Management Application

Purpose: **This will test the system's ability to push encryption keys to a console.**

Expected Results: **The UAS will push keys to the console to allow for communicate on an encrypted talk group.**

Setup: **This test requires three radios programmed with a talkgroup utilizing an AES encryption key. The radios and talkgroup need to be in a test crypto net in the UAS Key Management Application. All radios should be feature encrypted and enabled for OTAR operation. The radios should have their UKEK's loaded but not have any traffic encryption keys. (Delete Keys if required)**

Execution:

1. Attempt to switch a talk group to encrypted mode by selecting the talk group and selecting the private button.

   - ☐ Verify that console will not allow you to encrypt the talkgroup because the console does not have the encryption keys.

2. From the UAS, warm start the console. After the operation is complete, refresh the UAS screen.

   - ☐ The UAS will report warm started success the console.

3. Attempt to switch a talk group to encrypted mode by selecting the talk group and selecting the private button.
   - ☐ The console will now allow you to encrypt the talkgroup because the console has the encryption keys.

4. PTT the console and the encrypted radios should hear the call.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

5.9 Single Site Group Test Call

Purpose: **The Group Test Call will show that the site will allow a radio to communicate using a group call**

Expected Results: **The test will demonstrate that all radios assigned to a common group will hear a call and all radios assigned to an uncommon group will not hear the call**

Setup: **Set Radios 1, 2, and 3 to (Group A) per test group structure. Make sure Scan is turned OFF. All radios should not be in encrypted mode but have encryption keys.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64001 P25	64001
Radio 3	998003	TG64001 P25	64001

Execution:

1. PTT Radio 1 and talk.
   - The transmit (TX) indicators should turn on at Radio 1.
   - Audio should be heard in Radios 2 and 3.
   - The ID of Radio 1 should be seen on Radios 2 and 3.

2. Set Radio 3 to (TG64002 P25). PTT on Radio 1 and talk.

3. The transmit (TX) indicators should turn on at Radio 1.
   - Audio should be heard in Radio 2 only.
   - The ID of Radio 1 should be seen at Radio 2 only.

4. Repeat sets 1-3 for encrypted mode

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

5.10 Single Site Individual (Private) Call

Purpose: **The Individual Call test will verify that the site will allow two radios to communicate on a private call**

Expected Results: **This test will demonstrate that two radios can communicate on an individual call and other radios will not hear the private conversation.**

Setup: **Set Radios 1, 2, and 3 to (TG64001) per test group structure. All radios should not be in encrypted mode but have encryption keys.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64001 P25	64001
Radio 3	998003	TG64001 P25	64001

Execution:

1. Using the Radio 1, select the pre-stored ID of Radio 2 or enter the Radio 2 ID directly from the keypad, and PTT Radio 1.
    - Verify that Radio 2 receives the call and displays the ID of Radio 1. Verify that Radio 3 remains idle.
2. Release the PTT on Radio 1 and immediately PTT on Radio 2.
    - Verify that Radio 1 receives the call and displays the ID of Radio 2.
    - Verify Radio 3 remains idle.
3. Using the Radio 1, select the pre-stored ID of Radio 3 or enter the Radio 3 ID directly from the keypad, and PTT Radio 1.
    - Verify that Radio 3 receives the call and displays the ID of Radio 1.
    - Verify that Radio 2 remains idle.
4. Release the PTT on Radio 1 but do not immediately PTT Radio 3.
    - Verify that Radio 3 gives a Call Back Alert (WHC- “Who Has Called”) Indication.

5. Make a return call from Radio 3 back to Radio 1.

    - ☐ Verify that Radio 1 receives the call and displays the ID of Radio 3.
    - ☐ Verify Radio 2 remains idle.

6. Repeat steps 1-5 for encrypted mode.

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

5.11 Multi-Site Encrypted Group Test Call

Purpose: **The Group Test Call will show that the site will allow a radio to communicate using a group call**

Expected Results: **The test will demonstrate that all radios assigned to a common group will hear a call and all radios assigned to an uncommon group will not hear the call**

Setup: **Set Radios 1, 2, and 3 to (Group A) per test group structure. Make sure Scan is turned OFF. All radios should not be in encrypted mode but have encryption keys.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64001 P25	64001
Radio 3	998003	TG64001 P25	64001

Execution:

1. PTT Radio 1 and talk.
   - The transmit (TX) indicators should turn on at Radio 1.
   - Audio should be heard in Radios 2 and 3.
   - The ID of Radio 1 should be seen on Radios 2 and 3.

2. Set Radio 3 to (TG64002 P25), PTT on Radio 1 and talk.
   - The transmit (TX) indicators should turn on at Radio 1.
   - Audio should be heard in Radio 2 only.
   - The ID of Radio 1 should be seen at Radio 2 only.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

5.12 Multi-site Encrypted Individual (Private) Call

Purpose: **The Individual Call test will verify that the site will allow two radios to communicate on a private call**

Expected Results: **This test will demonstrate that two radios can communicate on an individual call and other radios will not hear the private conversation.**

Setup: **Set Radios 1, 2, and 3 to (TG64001) per test group structure. All radios should not be in encrypted mode but have encryption keys.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64001 P25	64001
Radio 3	998003	TG64001 P25	64001

Execution:

1. Using the Radio 1, select the pre-stored ID of Radio 2 or enter the Radio 2 ID directly from the keypad, and PTT Radio 1.
   - ☐ Verify that Radio 2 receives the call and displays the ID of Radio 1.
   - ☐ Verify that Radio 3 remains idle.

2. Release the PTT on Radio 1 and immediately PTT on Radio 2.
   - ☐ Verify that Radio 1 receives the call and displays the ID of Radio 2.
   - ☐ Verify Radio 3 remains idle.

3. Using the Radio 1, select the pre-stored ID of Radio 3 or enter the Radio 3 ID directly from the keypad, and PTT Radio 1.
   - ☐ Verify that Radio 3 receives the call and displays the ID of Radio 1.
   - ☐ Verify that Radio 6 remains idle.

4. Release the PTT on Radio 1 but do not immediately PTT Radio 3.
   - ☐ Verify that Radio 3 gives a Call Back Alert (WHC- “Who Has Called”) Indication.
   - ☐ Then make the return call from Radio 3 back to Radio 1.
   - ☐ Verify that Radio 1 receives the call and displays the ID of Radio 3.
   - ☐ Verify Radio 2 remains idle.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

5.13 Encrypted Group Test

Purpose: **The Group Test Call will show that the site will allow a radio to communicate using a group call**

Expected Results: **The test will demonstrate that all radios assigned to a common group will hear a call and all radios assigned to an uncommon group will not hear the call**

Setup: **Set Radios 1, 2, and 3 to (Group A) per test group structure. Make sure Scan is turned OFF. All radios should not be in encrypted mode but have encryption keys.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64001 P25	64001
Radio 3	998003	TG64001 P25	64001

Execution:

1. PTT Radio 1 and talk.
   - ☐ The transmit (TX) indicators should turn on at Radio 1.
   - ☐ Audio should be heard in Radios 2 and 3.
   - ☐ The ID of Radio 1 should be seen on Radios 2 and 3.

2. Set Radio 3 to (TG64002 P25). PTT on Radio 1 and talk.
   - ☐ The transmit (TX) indicators should turn on at Radio 1.
   - ☐ Audio should be heard in Radio 2 only.
   - ☐ The ID of Radio 1 should be seen at Radio 2 only.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

5.14 Encrypted Individual (Private)

Purpose: **The Individual Call test will verify that the site will allow two radios to communicate on a private call**

Expected Results: **This test will demonstrate that two radios can communicate on an individual call and other radios will not hear the private conversation.**

Setup: **Set Radios 1, 2, and 3 to (TG64001) per test group structure. All radios should not be in encrypted mode but have encryption keys.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64001 P25	64001
Radio 3	998003	TG64001 P25	64001

Execution:

1. Using the Radio 1, select the pre-stored ID of Radio 2 or enter the Radio 2 ID directly from the keypad, and PTT Radio 1.

2. Verify that Radio 2 receives the call and displays the ID of Radio 1. Verify that Radio 3 remains idle.

3. Release the PTT on Radio 1 and immediately PTT on Radio 2.

4. Verify that Radio 1 receives the call and displays the ID of Radio 2. Verify Radio 3 remains idle.

5. Using the Radio 1, select the pre-stored ID of Radio 3 or enter the Radio 3 ID directly from the keypad, and PTT Radio 1.

6. Verify that Radio 3 receives the call and displays the ID of Radio 1. Verify that Radio 6 remains idle.

7. Release the PTT on Radio 1 but do not immediately PTT Radio 3. Verify that Radio 3 gives a Call Back Alert (WHC- “Who Has Called”) Indication. Then make the return call from Radio 3 back to Radio 1.

8. Verify that Radio 1 receives the call and displays the ID of Radio 3. Verify Radio 2 remains idle.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

5.15 Phase 2 DES

Purpose: **Confirms the operation of DES encryption for phase 2 voice calls.**

Expected Results: **The encrypted talk groups can communicate.**

Setup **Console 1 programmed with a DES encrypted phase 2 talk group and two radios programmed with the same DES Talk group and key, one radio with the group but no key and one radio with the DES group with a different key.**

Execution:

1. Place a call from one of the radios with the correct key on the DES group
   - ☐ Confirm that the call is heard on the other radio and the console
   - ☐ Confirm the call is not heard on the two radios that do not have the correct key.
2. Place a call on the DES group from the console
   - ☐ Confirm that the call is heard on the two radios with the correct key
   - ☐ Confirm the call is not heard on the two radios that do not have the correct key.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

6. ENCRYPTED DATA

6.1 Encrypted data on an unencrypted radio

Purpose: **Confirm that when the system is setup for encrypted data, the data communication leaves the system encrypted and cannot be read by a radio that does not have the encryption key.**

Expected Results: **The radio can't be pinged, and the radio personality can't be read/programmed.**

Setup: **This test requires: section 'Unit Enable/Disable from the UAS' has been performed, radio 9880005 is enabled but not encrypted, needs to run from edata terminal, edata setup not set to best effort.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	9980001	TG64001 P25	64001
Radio 2	9980002	TG64001 P25	64001
Radio 5	9980005	TG64001 P25	64001

Execution:

1. From the edata terminal.
   - ☐ Verify that a host can't ping the radio.
   - ☐ Verify the radio personality can't be read.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

6.2 Unencrypted data With Encrypted Radio

Purpose: **Confirm when a radio does have the encryption key it can communicate with the Encrypted Data Terminal.**

Expected Results: **The radio can be pinged, and the radio personality can be read/programmed.**

Setup: **This test requires: Radio 9880004 is enabled and encrypted, needs to run from edata terminal, edata setup not set to best effort.**

Radio 4 needs to be part of the "eData CryptoNet", and also have "keys" loaded.

Description	Radio LID	TG Description	TG ID
Radio 4	9980004	TG 64001 P25	64001

Execution:

1. From the edata terminal.
   - ☐ Verify that a host can ping the Radio 4.
   - ☐ Verify the radio personality can be read.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

7. IN-CALL STATUS REPORTING

7.1 In-Call Location Reporting Radio

Purpose: **This test will demonstrate system ability to send location status from a radio.**

Expected Results: **The system will display the radio location, and the location will change when the radio moves.**

Setup: **The system needs to be setup using the 'In-Call Status Reporting Manual' and the CLTsim need to be set up using Appendix A. This test will not work unless the radio has GPS lock, so this test may not work indoors.**

Execution:

1. Log into CLTsim and open two terminal windows
   a. In terminal windows 1 type '. /cltsim –ccltsim.cfg' do not close the window
   b. In terminal windows 2 type
   'cltcmd -1 10.128.1.209 –u 21225 –s –j ipv4.10.128.79.1@vida.local –n location –n userStatus

2. PTT radio 1 for at least 3 seconds

3. Terminal widow 1 will show the output of the GPS data.

   ☐ Check to make sure GPS data is displayed.

4. Move radio 1 about 50 feet and PTT again for 3 seconds

   ☐ Verify GPS Data changes.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

7.2 In-Call Status Reporting Radio

Purpose: **This test will demonstrate system ability to send status from a radio.**

Expected Results: **The system will display the status from a radio.**

Setup: **The system needs to be setup using the 'In-Call Status Reporting Manual' and the CLTsim need to be set up using Appendix A.**

Execution:

1. Use terminal windows from pervious test
   a. In terminal windows 2 type
      'cltcmd -1 10.128.1.209 –u 21225 –s –j vuid.99999.10.998.6401@harris.com –n groupAlert –n userStatus
2. PTT radio 1 for at least 3 seconds
3. Terminal widow 1 will show the status of radio 1.
   - ☐ Check to make sure radio 1 status is 'Open'.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

7.3 In-Call Emergency Reporting Radio

Purpose: **This test will demonstrate system ability to send location status from a radio.**

Expected Results: **The system will display the radio emergencies.**

Setup: **The system needs to be setup using the 'In-Call Status Reporting Manual' and the CLTsim need to be set up using Appendix A.**

Execution:

1. Use terminal windows from pervious test
    a. In terminal windows 2 type
    'cltcmd -1 10.128.1.209 –u 21225 –s –j vuid.99999.10.998.6401@harris.com –n groupAlert –n userStatus

2. Create emergency on Radio1.

    - ☐ Check to make sure Emergency is displayed as '1'.

3. Clear emergency on Radio 1
    - ☐ Check to make sure Emergency is changed to '0'

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

7.4 In-Call Location Reporting Be-On

Purpose: **This test will demonstrate system ability to send location status from a BeOn terminal.**

Expected Results: **The system will display the radio location, and the location will change when the radio moves.**

Setup: **The system needs to be setup using the 'In-Call Status Reporting Manual' and the CLTsim need to be set up using Appendix A. This test will not work unless the radio has GPS lock, so this test may not work indoors.**

Execution:

1. Log into CLTsim and open two terminal windows
   a. In terminal windows 1 type '. /cltsim –ccltsim.cfg' do not close the window
   b. In terminal windows 2 type
   'cltcmd -1 10.128.1.209 –u 21225 –s –j ipv4.10.128.79.1@vida.local –n location –n userStatus
2. PTT radio 1 for at least 3 seconds
3. Terminal widow 1 will show the output of the GPS data.
   - ☐ Check to make sure GPS data is displayed.
4. Move radio 1 about 50 feet and PTT again for 3 seconds
   - ☐ Verify GPS Data changes.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

7.5 In-Call Status Reporting Be-On

Purpose: **This test will demonstrate system ability to send status from a radio.**

Expected Results: **The system will display the status from a radio.**

Setup: **The system needs to be setup using the 'In-Call Status Reporting Manual' and the CLTsim need to be set up using Appendix A.**

Execution:

1. Use terminal windows from pervious test
    a. In terminal windows 2 type
    'cltcmd -1 10.128.1.209 –u 21225 –s –j vuid.99999.10.998.6401@harris.com –n groupAlert –n userStatus
2. PTT radio 1 for at least 3 seconds
3. Terminal widow 1 will show the status of radio 1.
    - ☐ Check to make sure radio 1 status is 'Open'.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

7.6 In-Call Emergency Reporting Be-On

Purpose: **This test will demonstrate system ability to send location status from a radio.**

Expected Results: **The system will display the radio emergencies.**

Setup: **The system needs to be setup using the 'In-Call Status Reporting Manual' and the CLTsim need to be set up using Appendix A.**

Execution:

1. Use terminal windows from pervious test
    a. In terminal windows 2 type
    'cltcmd -1 10.128.1.209 –u 21225 –s –j vuid.99999.10.998.6401@harris.com –n groupAlert –n userStatus

2. Create emergency on Radio1.

    - ☐ Check to make sure Emergency is displayed as '1'.

3. Clear emergency on Radio 1

    - ☐ Check to make sure Emergency is changed to '0'

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

8. HIGH AVAIBILITY WIDE AREA ROUTER FAILURE

Purpose: **Demonstrate the capabilities of the system to work after a WAR failure**

Expected Results: **System components that are set-up with High Availability will continue to work after a WAR failure.**

Setup: **These tests are setup to be run twice, once on each router. So, after completing step 4 restart the WAR router if not already running wait 20 minutes and rerun the tests for the second router. These tests will simulate a WAR failure by disconnecting it from the Wide Area Network, so the WAR to WAN connection will need to be known.**

1. Use Radio 1 to initiate a call

   - ☐ Verify that the call is heard on the Radio 2. Keep the call active during fail-over.

2. Use Radio 3 to initiate a call

   - ☐ Verify that the call is heard on Radio 4. Keep the call active during fail-over.

3. Log in to s0u1nss and s0u2nss and change your user to the root user by typing ‘su –‘ and entering the password.

4. Type ‘HArunning’ into both NSSs, one will report that it is the ‘Stand By’ and one will report that it is the ‘Primary’ log the information in the chart below.

	Name Of Primary NSS	Name of Primary WAR	Name of Primary RNM	Name of Primary RSM	Shutdown Time
Test 1					
Test 2					

5. Log into the ‘Primary’ WAR that is associated with the ‘Primary’ NSS. Shut off the connection to the WAN by performing a shut on the necessary ports.

- The call from Radio 3 to Radio 4 will be dropped.
- The call from radio 1 to 2 will continue and the console will lose connectivity to the VNIC.
- Verify that after a short delay, the Backup server NSS2 automatically takes over as the primary server.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

8.1 UAS Site Access Control for Invalid User ID

Purpose: **This test will demonstrate access control for Subscriber units with invalid radio IDs and High Availability of the RSM.**

Expected Results: **This test will deny a radio with an invalid Subscriber ID access to the system. Once the radio is added to the system the primary RSM will download it to the sites and allow the radio access. When the primary RSM is turned off and the radio is deleted from the UAS the secondary RSM will delete the radio from the system. Once the radio is deleted from the system the radio will again be denied access.**

Setup: **Use the table below to set up the new radio in the UAS**

Voice End User								
User Id	**Name**	**Description**	**Personality**	**User Privilege**	**Enable P25 AES OTAR**	**Manually-Keyed**	**P25 Voice Auth**	**Preferred Vocoder**
010:998:9150	Rad9150	Radio9150	Pers1	998_10_supervisor	FALSE	FALSE	FALSE	P25 Full Rate
OS Voice Auth	**Transc Allowed Flag**							
FALSE	TRUE							

Subscriber Unit							
Description	**RSI**	**Electronic Serial Number**	**Protocol Mask**	**Status**	**Sub Type**	**Assigned End User**	**Algorithm Support**
Radio9150	99899150	109989150	P25	Enabled Unit	Harris P5400	010:998:9105	AES

Execution:

1. Going into a site traffic controller and type ‘show udb 109989150’
   - Verify the radio is not present in the traffic controller database
2. Program Radio 9801 with an ID 9989150.

3. Attempt to PTT Radio 9150.

   - ☐ Verify access to the site is denied and audio is not heard on Radio 2.

   - ☐ Verify the system is still functional by PTT Radio 2 and verify the audio is heard on Radio 3.

4. Use the supplied table to enter radio 109989150 in to the UAS database.
   a. Select Agency/" agency name"/Voice End User. Click Add Entry and then on the End User Detail screen input the User ID, password ("p25user"), Name, Description, etc. of the user. Click OK and download.

      - ☐ Verify the user ID has been added to the list of users\

   b. Select Agency/"agency name"/Subscriber Unit and enter the appropriate User ID, IP Address, and ESN for the user created in step 7. Click OK and download.

5. Loin into a site traffic controller issue a "show udb 109989150

   - ☐ Verify the radio is now present in the traffic controller database

6. Key radio 9150

   - ☐ Verify access to the site is permitted and audio is heard on radio.

7. Restart radio 9150 and PTT the radio

   - ☐ Verify access to the site is permitted and audio is heard on radio 9012.

8. Delete 10998999150 from the UAS database

9. Key radio 9150 from UAS

   - ☐ Verify access to the site is not permitted and audio is not heard.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

8.2 Site Activity using the Activity Warehouse

Purpose: **Demonstrate the capability to create various Agency level system usage reports.**

Expected Results: **This test will create an Agency level user reports.**

Setup: **Ensure radio traffic has occurred across the network recently. If necessary or desired, place some calls with a known radio ID on multisite talk groups prior to running the test for reference during the test.**

Execution:

1. Log into the SMT PC as a System level administrator.

2. Open Internet Explorer and browse to 'https://*s0u1pro.vida.local/*reports' and log in with active directory credentials.

3. Select Activity Reports → Call Activity
   a. enter the time period for the report (example: 2-hour window before this test).

4. Enter additional report information required.

5. Click on "View Report"
   - Check to make sure that there is call activity. These reports can be up to 2 hours behind.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

8.3 VIDA REGIONAL NETWORK MANAGER (RNM)

Purpose: **Demonstrate the capability to monitor real-time call activity from the RNM.**

Expected Results: **This test will show active call traffic on specific talk groups and SIDs.**

Setup: **Administrator access to the RNM.**

Execution:

1. On a client computer, open the windows Internet Explorer and browse to https://s0u1rnm.vida.local/nmc and log in with an Active Directory account.
2. Choose the system map and select the 'Launch Application' button.
3. Open the Realtime tab and Click Site Calls.
4. Select the site and expand.
5. Check the box next to the channels and select to add the channels to the target list. Select the 'ok' button to launch the application.
6. Place a group call from Radio 1 to Radio 2 on the site.
   - ☐ Verify that the event viewer displays the talkgroup ID and calling party ID.
   - ☐ Verify the state changes from Free to Talk.
   - ☐ Verify the TG Alias displays the Group Number.
7. Use Internet Explorer to browse to https://s0u2rnm.vida.local/nmc and repeat test steps 1-6 for the second RNM.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

8.4 Regional Network Manger Test

Purpose: **Demonstrate the capability to monitor system alerts from the RNM.**

Expected Results: **This test will show system level equipment icons.**

Setup: **Administrator access to the RNM.**

Execution:

1. On a client computer, open the windows Internet Explorer and browse to https://s0u1rnm.vida.local/nmc and log in with the active directory account.

2. Choose the system map and select the 'Launch Application' button. Select the 'Network' tab and expand the tree in the left-hand panel until you can see a site in the right-hand panel.

   - Verify the Infrastructure is presented.

   - Select an object and right click to select properties to view information related to the object.

3. Substitute https://s0u2rnm.vida.local/nmc and repeat test steps 1-3 for the second RNM.

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

8.5 RF System Alarms Indications are reported to the RNM

Purpose: **Demonstrate the capability to monitor system faults & alarms at the RNM.**

Expected Results: **System level equipment will indicate faults & alarms at the RNM.**

Setup: **Access to the site under test and the regional RNM. The alarm will need to be generated by equipment being physically powered-down. Note the time of the alarm condition for later tests. Call up the RNM Domain screen and verify that all map icons are either green or blue. On the Fault Browser screen delete any prior alarms.**

Execution:

1. On a client computer, open the windows Internet Explorer and browse to https://s0u1rnm.vida.local/nmc and log in with an Active Directory account.

2. Choose the system map and select the 'Launch Application' button.

3. Select the 'Network' tab and expand the tree in the left-hand panel until you can see a site in the right-hand panel.

4. Generate an alarm on a device (see chart) by powering down or otherwise disabling the device.

   - Verify that the RNM indicates a site alarm for the affected device.

5. Turn the device back ON.

   - Verify that the device alarm clears and displays green.

6. Review alarm details by performing a Right Mouse Click on an Object. Select the desired menu option.

7. Repeat steps 1-4 for all equipment listed in the below chart.

8. Substitute https://s0u2rnm.vida.local/nmc and repeat test steps 1-5 for the second RNM.

Record the results below for each site. (Note: This form can be modified to reflect actual as-built alarms

Tester:		Results:	Date:	
Alarm #	Name	Pass/Fail	Remarks	
1	Traffic Controller			
2	Router			
3	Switch			
4	Network Sentry			
5	MME			

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

8.6 Network Sentry Site Alarm Indications are reported to the RNM

Purpose: **Demonstrate the capability to monitor site faults & alarms at the RNM.**

Expected Results: **Site level equipment will indicate faults & alarms at the RNM.**

Setup: **This test verifies that the Site & Shelter Alarms are connected to the new system and alarm names are programmed to show the alarm types and locations. Site specific digital alarm inputs connected to the alarm management system (NetGuardian or Network Sentry) alarm unit.**

Execution:

1. On a client computer, open the windows Internet Explorer and browse to https://s0u1rnm.vida.local/nmc and log in with the Active Directory account.

2. Choose the system map and select the 'Launch Application' button.

3. Select the 'Network' tab and expand the tree in the left-hand panel until you can see a site in the right-hand panel.

4. Select a physical site to test alarm inputs.

5. Create a condition that will either simulate an alarm (jumper alarm contacts) or the actual event to trigger each alarm

   - Verify that the alarm is detected and displayed in the RNM Network Viewer and is listed in the Fault Browser

6. Clear the alarm condition

   - Observe that the alarm indication has cleared in both the Network Viewer and the Fault Browser

7. Repeat for each alarm and for each site in the system

8. Record the results below for each site. (Note; This form can be modified to reflect actual as-built alarms).

Site #:			Site Name	
Tester:		Results:	Date:	
Alarm #	Name	Pass/Fail	Remarks	
1	Door			
2	Smoke Detector			
3	Heat Detector			
4	Building Low Temp			
5	Building High Temp			
6	Main Power Fail			
7	ATS Normal			
8	ATS Emergency			
9	Generator Low Oil			
10	Generator Over Temp			
11	Generator Over Crank			
12	ACH1 L.O.			
13	ACH2 L.O.			
14	Surge Arrestor 1			
15	Surge Arrestor 2			
16	Multicoupler Top			
17	Multicoupler Bottom			

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

9. CONTROL POINT MOVEMENT

9.1 DCP Forced Control Point Movement

Purpose: **This test will demonstrate the DCP system can move the control point in response to user command.**

Expected Results: **This test will verify that the Control Point can be moved from the active site to an alternate Control Point Site. After the control point is switched to the alternate Control Point the system should operate normally.**

Setup: **The DCP system is operating with an active control point and at least two sites are enabled to be the control point.**

Execution:

1. Log into the RNM
2. In Network view identify the site which is the active control point.
3. Right click on the control point site icon and select 'Change Control Point to Best Site Available".
4. Verify system is still functioning (i.e. voice calls can be made – between radios and a radio and console and optionally data calls can be made (e.g. radios can be 'pinged').
5. Verify that the RNM indicates a different site as control point and the previous control point is now a TX site. (note – a CP only site displays "zzzz" when it is not the active control point.)
6. On the RNM right click on the previous control point site and select "Change to be the Control Point".
7. Verify system is still functioning (i.e. calls can be made – between radios and a radio and console and optionally data calls can be made (e.g. radios can be 'pinged').
8. Verify that the RNM indicates the control point has moved to the site selected in step 6 and the previous control point is now a TX site. (note – a CP only site displays "zzzz" when it is not the active control point.)

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

9.2 DCPControl Point Movement in response to Faults at the Active Control Point

Purpose: **This test will demonstrate that the Control Point will move in response to failures at the active Control Point.**

Expected Results: **This test will verify that the DCP system will move the active Control Point to an alternate control point site when the active control point experiences failures. After the Control Point moves the old control point should drop into bypass and the rest of the system should operate normally as a Simulcast cluster.**

Setup: **The DCP system is operating with an active control point and is properly configured with at least two sites enabled to be the control point.**

Execution:

1. Verify system is functioning (i.e. calls can be made – between radios and a radio and console and optionally data calls can be made (e.g. radios can be 'pinged').

2. At the control point site disconnect the 1pps cable from GPS B.

3. Verify the system is still functioning (i.e. calls can be made – between radios and a radio and console and optionally data calls can be made (e.g. radios can be 'pinged') and control point has not moved. The traffic controllers at the control point display 'CC xx' and 'TC xx' when idle; at a satellite site the traffic controllers display "TR xx' where xx is the channel number.(>

4. At the control point site disconnect the 1pps cable from GPS A.

5. Verify that the control point moved to next ranked site and the old control point is now in bypass. The traffic controllers at the control point display 'CC xx' and 'TC xx' when idle: Any channels that are configured to be active at the old control point site when it is in bypass will have all their status LED red. In bypass all the traffic controllers display 'CC xx' and 'TC xx' when idle and the status LED will be red.

6. Verify the RNM indicates the new control point and shows the old control point site is now in bypass.

7. Verify the simulcast system is still functioning (i.e. calls can be made – between radios and a radio and console and optionally data calls can be made (e.g. radios can be 'pinged').

8. If the old control point has channels active in bypass, verify radios switched to this bypass site acquire the control channel and can communicate. (note – this step could be skipped; the bypass tests in sections 20.x will do this) >

9. Restore the connections to the GPS receivers at the site in bypass (the old control point site).

10. Verify that the site exits bypass and joins the simulcast cluster.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

10. P25 TRUNKED CALLS AND SITE FEATURES

Purpose: **These tests will verify that the site can provide radio communications at the site level.**

Expected Results: **These tests will demonstrate that the site can provide communications for radios.**

Setup: **All tests in this section assume that the UAS setup matches the configuration in this test. All testing in this section is to be done with phase 1 radios.**

10.1 Transmit Grant Tone

Purpose: **Demonstrate the system channel grant tone is heard on the radio.**

Expected Results: **This test will show that the radio will play a grant tone when the radio is assigned a working channel.**

Setup: **One radio with valid ID and a valid group on selected system. Grant tone (Ready to Talk tone) enabled in radio personality as applicable for specific radio type being tested.**

Execution:

1. Press PTT button on radio with valid group selected.
2. Verify grant tone is heard at radio when working channel access is granted.

Note: If the call is queued, the grant tone will be delayed until the call is assigned a working channel.

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

10.2 Transmission Trunking

Purpose: **This test will demonstrate that the System is working as a Transmission Trunking system.**

Expected Results: **The tests verify that the Control Channel will assign a working channel to the radio and that the radio and site will work as a trunking set.**

Setup: **Radios 1, 2, and 3 should be the only radios on the system.**

Monitor System channel assignment in RSM Site Activity Real-Time Viewer.

All Radios are registered on Site 1.

Description	Radio LID	TG Description	TG ID
Radio 1	9980001	TG 64001 P25	64001
Radio 2	9980002	TG 64001 P25	64001
Radio 3	9980003	TG 64001 P25	64001

Execution:

1. Log into RNM and start RSM Site Activity application in the real-time viewer. Observe all channels on Site 1.

2. PTT Radio 1 and talk.
   - ☐ The transmit (TX) indicators should turn on at Radio 1.
   - ☐ Verify the number of the channel assigned.

3. PTT Radio 2 and talk.
   - ☐ The transmit (TX) indicators should turn on at Radio 2.
   - ☐ Verify the next channel is assigned.

4. PTT Radio 3 and talk.
   - ☐ The transmit (TX) indicators should turn on at Radio 3.
   - ☐ Verify the next channel is assigned.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

10.3 Message Trunking on Phase 1

Purpose: **This test will demonstrate that the system, for FMDA Phase 1 group calls, operates as Enhanced Message Trunking for Group Calls.**

Expected Results: **Verify that the system will assign the same working channel to a Message Trunking call if the next call happens within the Message Trunking hang time. During the hang time, the transmitting radio will return to the Control Channel for Phase 1 Group Calls.**

Setup: **Radios 1, 2, and 3 should be the only radios on the system. Each call needs to happen within 3 seconds of each other for this test to work.**
TG 64301 is a FDMA (Phase 1) MT Group.

Monitor System channel assignment in RSM Site Activity Real-time viewer.

Description	Radio LID	TG Description	TG ID	Site
Radio 1	9980001	TG 64301 P25	64301	1
Radio 2	9980002	TG 64301 P25	64301	1
Radio 3	9980003	TG 64301 P25	64301	1

Execution:

1. Log into RNM and start RSM Site Activity application in the real-time viewer. Observe all channels on Site 1 for each of the steps below.

2. PTT Radio 1 and talk.
   - ☐ The transmit (TX) indicators (red light) should turn on at Radio 1.
   - ☐ On the RNM, observe the number of the channel assigned.
   - ☐ Verify audio from Radio 1 is heard at Radio 2 and Radio 3.

3. Un-PTT Radio 1.
   - ☐ Verify Radio 1's LED light turns off, no color, to indicate Radio 1 is on the Control Channel (CC), during the Hang Time. (This is Enhanced Message Trunking for FDMA).

4. PTT Radio 2, within the 3 second hang time, and talk.
   - ☐ The transmit (TX) indicators (red light) should turn on at Radio 2.
   - ☐ Verify the same channel is assigned, as in step 2.
   - ☐ Verify audio from Radio 2 is heard at Radio 1 and Radio 3.

5. Un-PTT Radio 2.
   - ☐ Verify Radio 2's LED light turns off, no color, to indicate Radio 2 is on the Control Channel (CC), during the Hang Time.

6. PTT Radio 3, within the 3 second hang time, and talk.
   - ☐ The transmit (TX) indicators (red light) should turn on at Radio 3.
   - ☐ Verify the same channel is assigned as in steps 2, & 4.
   - ☐ Verify audio from Radio 3 is heard at Radio 1 and Radio 2.

7. Un-PTT Radio 3
   - ☐ Verify Radio 3's LED light turns off, no color, to indicate Radio 3 is on the Control Channel (CC), during the Hang Time.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

10.4 Message Trunking on Phase 2

Purpose: **Demonstrate the system, for TDMA Phase 2 group calls, operates as Standard Message Trunking for Group Calls.**

Expected Results: **System will assign the same working channel to a Message Trunked call if the next call happens within the Message Trunked hang time. During the hang time, the transmitting radio will remain on the Traffic (Working) Channel for Phase 2 Group Calls.**

Setup: **TDMA Enabled Radios 1, 2, and 3 should be the only radios on the system. Each call needs to happen within 3 seconds of each other for this test to work. TG 64353 is a TDMA (Phase 2) MT Group**

Monitor System channel assignment in RSM Site Activity Real-time Viewer.

Description	Radio LID	TG Description	TG ID	Site
Radio 1	9980001	TG 64353 P25	64353	1
Radio 2	9980002	TG 64353 P25	64353	1
Radio 3	9980003	TG 64353 P25	64353	1

Execution:

1. Log into RNM and start RSM Site Activity application in the real-time viewer. Observe all channels on Site 1 for each of the steps below.

2. PTT Radio 1 and talk.
   - ☐ The transmit (TX) indicators (red light) should turn on at Radio 1.
   - ☐ On the RNM, observe the number of the channel assigned and the channel slot assigned.
   - ☐ Verify audio from Radio 1 is heard at Radios 2 and 3.

3. Un-PTT Radio 1
   - ☐ Verify Radio 1's LED Receive (RX) indicator turns green, to indicate Radio 1 remains on the Traffic (Working) channel, during the Hang Time.

4. PTT Radio 2, within the 3 second hang time, and talk.
   - ☐ The transmit (TX) indicators (red light) should turn on at Radio 2.
   - ☐ Verify the same channel / slot is assigned, as in step 2.
   - ☐ Verify audio from Radio 2 is heard at Radios 1 and 3.

5. Un-PTT Radio 2
   - ☐ Verify Radio 2's LED light turns green, to indicate Receive (Rx). Indicates Radio 2 remains on the Traffic (Working) channel, during the Hang Time.

6. PTT Radio 3, within the 3 second hang time, and talk.
   - ☐ The transmit (TX) indicators (red light) should turn on at Radio 3.
   - ☐ Verify the same channel / slot is assigned in steps 2 & 4.
   - ☐ Verify audio from Radio 3 is heard at Radios 1 and 2.

7. Un-PTT Radio 3
   - ☐ Verify Radio 3's LED light turns green, to indicate Receive (Rx). Indicates Radio 3 remains on the Traffic (Working) channel, during the Hang Time.
   - ☐ After the hang time expires, verify Radio 3's LED light turns off.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

10.5 Group Test Call

Purpose: **The Group Test Call will show that the site will allow a radio to communicate using a group call.**

Expected Results: **The test will demonstrate that all radios assigned to a common group will hear a call and all radios assigned to an uncommon group will not hear the call.**

Setup: **Set Radios 1, 2, and 3 to (Group A) per test group structure. Make sure Scan is turned OFF.**

Description	Radio LID	TG Description	TG ID
Radio 1	9980001	TG 64001 P25	64001
Radio 2	9980002	TG 64001 P25	64001
Radio 3	9980003	TG 64001 P25	64001

Execution:

1. PTT Radio 1 and talk.
   - ☐ The transmit (TX) indicators should turn on at Radio 1.
   - ☐ Audio should be heard in Radios 2 and 3.
   - ☐ The ID of Radio 1 should be seen on Radios 2 and 3.

2. Set Radio 3 to (TG64002 P25). PTT on Radio 1 and talk.
   - ☐ The transmit (TX) indicators should turn on at Radio 1.
   - ☐ Audio should be heard in Radio 2 only.
   - ☐ The ID of Radio 1 should be seen at Radio 2 only.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

10.6 Individual (Private) Call

Purpose: **The Individual Call test will verify that the site will allow two radios to communicate on a private call**

Expected Results: **This test will demonstrate that two radios can communicate on an individual call and other radios will not hear the private conversation.**

Setup: **Set Radios 1, 2, and 3 to (TG64001) per test group structure.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64001 P25	64001
Radio 3	998003	TG64001 P25	64001

Execution:

1. Using the Radio 1, select the pre-stored ID of Radio 2 or enter the Radio 2 ID directly from the keypad, and PTT Radio 1.
   - ☐ Verify that Radio 2 receives the call and displays the ID of Radio 1.
   - ☐ Verify that Radio 3 remains idle.

2. Release the PTT on Radio 1 and immediately PTT on Radio 2.
   - ☐ Verify that Radio 1 receives the call and displays the ID of Radio 2.
   - ☐ Verify Radio 3 remains idle.

3. Using the Radio 1, select the pre-stored ID of Radio 3 or enter the Radio 3 ID directly from the keypad, and PTT Radio 1.
   - ☐ Verify that Radio 3 receives the call and displays the ID of Radio 1.
   - ☐ Verify that Radio 2 remains idle.

4. Release the PTT on Radio 1 but do not immediately PTT Radio 3.
   - ☐ Verify that Radio 3 gives a Call Back Alert (WHC- “Who Has Called”) Indication.

5. Make the return call from Radio 3 back to Radio 1.
   - ☐ Verify that Radio 1 receives the call and displays the ID of Radio 3.
   - ☐ Verify Radio 2 remains idle.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

10.7 Unit to Unit Call Alert Paging

Purpose: **To demonstrate that a radio can send a page to a different radio on the system.**

Expected Results: **This test will verify that radio 1 can send a page to radio 2**

Setup: **Radio 1 with Call Alert programmed into a button ("PAGE") and Radio 2's ID programmed into its Individual Call list. Radio 1 and Radio 2 on the same site.**

Execution:

1. Select the PAGE function from the MENU on Radio 1. Select Radio 2 from the preprogrammed list of radios and PTT Radio 1.

   - ☐ Verify Radio 1 displays "*TX PAGE" on the second line.
   - ☐ Verify Radio 2 displays the ID of Radio 1 on its first line and "*RX PAGE" on the second line.
   - ☐ Verify Radio 2 beeps multiple times to indicate a received page.
   - ☐ Verify Radio 1 beeps multiple times to indicate the page was successfully sent.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

10.8 Multi-site Announcement Group Call

Purpose: **This test will demonstrate that the system will allow a group call to function in a multi-site environment**

Expected Results: **The test will demonstrate that all radios assigned to a common group will hear a call, even though some of the radios are at distant sites and all radios assigned to an uncommon group will not hear the call**

Setup: **Groups 64101 and 64102 are in Announcement Group 64107 per test group structure. Ensure Scan is turned OFF.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64002 P25	64002
Radio 3	998002	TG64003 P25	64003

Execution:

1. PTT Radio 1 and talk.
2. The transmit (TX) indicators should turn on at Radio 1.
   - Audio should be heard on Radios 2 and 3.
   - ANNOUNCE should be displayed on Radios 2 and 3.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

10.9 Multisite Emergency Group Call

Purpose: **Demonstrate the capability of the system to process an emergency group call.**

Expected Results: **This test will verify that when a radio indicates an emergency group call. All other radios in the group indicate an emergency and the emergency can be cleared by an administrator radio.**

Setup: **Program 3 Radios with the same emergency home group. Set the supervisor (Radio 1) & Radio 2 to the home group. Set Radio 3 to a different group (not home group). A console will be used to clear the emergency.**

Description	Radio LID	TG Description	TG ID	Site
Radio 1	9980001	TG 64001 P25	64001	1
Radio 2	9980002	TG 64001 P25	64001	2
Radio 3	9980003	TG 64003 P25	64003	1

Execution:

1. Press the Emergency call button on Radio 1 and talk within the pre-defined Emergency Auto-key time, and/or PTT Radio 1 during or just after that time.

   - ☐ Verify that Radio 1 indicates the “TX EMER” declaration and that it reverts to the home group.
   - ☐ Verify that Radio 1 (on Site 1) and Radio 2 (on Site 2) indicate a “RX EMER” and hear audio on the emergency home group.
   - ☐ Verify Radio 3 does not display the emergency.

2. Clear the emergency with the Console.

   - ☐ Verify the emergency clears in the radios.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

10.10 System All Call

Purpose: **Demonstrate the capability of the system to route a call to all radios on the system.**

Expected Results: **This test will demonstrate the system's ability to route a single call to all available radios on the system.**

Setup: **Note: If want to create demand for a Full Rate All Call, then one radio must be on the Full Rate All Call.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	9980001	TG64000 P25	64000
Radio 2	9980002	TG64001 P25	64001
Radio 3	9980003	TG64002 P25	64002

Execution:

1. With Radio 1 place an Individual call to talk group 64000 (All Call Talk Group)

   - Audio should be heard at Radios 2 and 3.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

10.11 Transmit Denied (for Invalid radio ID)

Purpose:	**This test is set up to demonstrate that a radio can be denied transmission on a site**
Expected Results:	**This test will verify the system's ability to deny a radio to transmit on one site and allow the radio to work on a different site.**
Setup:	**Program system so that radio ID is not valid on the site under test. Download database to site.**

Execution:

1. Program Radio 1 with an invalid ID
2. PTT Radio 1
   - Verify the radio is prohibited access to system.
3. Reprogram the radio to the original personality.

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

10.12 Single Site Call Queue Declaration Alert

Purpose: **This test will demonstrate the system queuing.**

Expected Results: **This test will verify that the system will assign users in a queue when the system has no available channels and assign users a working channel when the system has an available channel.**

Setup: **This test requires four radios and two working channels. Disable channels (if necessary) until there are two working channels at the site. This test is to be run with no other users on the system.**

Description	Radio LID	TG Description	TG ID
Radio 1	9980001	TG 64001 P25	64001
Radio 2	9980002	TG 64002 P25	64002
Radio 3	9980003	TG 64003 P25	64003
Radio 4	9980004	TG 64003 P25	64003

Execution:

1. Busy up all talk paths on the system with radio 1, and 2 by pressing and holding the PTT button.
2. With all talk paths busied, momentarily press and release the PTT button on test Radio 3
   - Verify that a Call Queued tone is heard at the radio.
3. Unkey (release PTT button) radio 2.
   - Verify that Radio 3 is assigned to the free talk path.
4. The grant tone is heard at the radio, without having to rekey the radio (repressing the PTT button).
5. Press the PTT button on Radio 3 within the auto key time applicable to the radio type (approx. 2 seconds) to keep the assigned channel.
   - Verify that audio from Radio 3 is heard at Radio 4.
6. Unkey all radios.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

10.13 Recent User Priority

Purpose: **Demonstrate system's ability to prioritize recent users in queueing situations.**

Expected Results: **When radios of the same priority level enter the queue, one that has been recently active will exit the queue first.**

Setup: **This test requires four radios and two working channels.**

Disable channels (if necessary) until there are two working channels at the site. Set the radio according to the table below. This test is to be run with no other users on the system and at intervals as set in the Recent Caller Interval (a time of greater than 10 seconds is recommended for the test which is configurable in the Traffic Controller module). This will only work if preformed quickly.

Description	Radio LID	TG Description	TG ID
Radio 1	9980001	TG 64001 P25	64001
Radio 2	9980002	TG 64002 P25	64002
Radio 3	9980003	TG 64003 P25	64003
Radio 4	9980004	TG 64004 P25	64004

Execution:

1. PTT and release Radio 1 (establish a recent user entry).
2. PTT Radios 3 and 4 and hold on transmit to busy both working channels.
3. PTT and release Radio 2 (queue a call less recent than Radio 1).
4. PTT and release Radio 1 (queue the recent user).
5. Unkey Radio 4
   - Verify that Radio 1 un-queues and transmits.
6. Unkey all radios.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

10.14 Call Priority for Group IDs

Purpose: **This test is set up to demonstrate the system's ability to allow a user with a higher priority to get assigned a channel before a user with a lower priority despite who enter the queue first.**

Expected Results: **This test will verify that a user that has a higher priority will get assigned a channel before users with a lower priority regardless of who entered the queue first. In this test radio 4 should get the first available channel, because it has a higher priority, and radio 3 will get assigned a channel next because it has a lower priority.**

Setup: **This test requires two working channels on the site. Disable channels (if necessary) until there are two working channels on the site. Setup the radio according to the table below. This test is to be run with no other users on the system.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	9980001	TG64001 P25	64001
Radio 2	9980002	TG64002 P25	64002
Radio 3	9980003	TG64004 P25	64003
Radio 4	9980004	TG64003 P25	64004

Execution:

1. PTT Radios 2 and 4 and hold on transmit to busy both working channels.
2. PTT and release Radio 1 (medium priority entry into the queue).
3. PTT and release Radio 3 (high priority entry into the queue).
4. Un-key Radio 4
   - Verify that Radio 3 un-queues and keys.
5. Un-key Radio 2
   - Verify that Radio 1 un-queues and keys.
6. Un-key all radios.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

10.15 Emergency Call Priority for Group IDs In Phase 1

Purpose: **Demonstrate the system's ability to allow a user with a higher priority to get assigned a channel before a user with a lower priority, despite who enters the queue first.**

Expected Results: **This test will verify that a user who has a higher priority will get assigned a channel before users with a lower priority regardless of who entered the queue first. In this test radio 4 should get the first available channel, because it has a higher priority, and radio 3 will get assigned a channel next because it has a lower priority.**

Setup: **This test requires two working channels on the site. Disable channels (if necessary) until there are two working channels on the site. Setup the radio according to the table below. This test is to be run with no other users on the system.**

Description	Radio LID	TG Description	TG ID
Radio 1	9980001	TG 64001 P25	64001
Radio 2	9980002	TG 64002 P25	64002
Radio 3	9980003	TG 64003 P25	64003
Radio 4	9980004	TG 64004 P25	64004

Execution:

1. PTT Radios 4 and 3 and hold on transmit to busy both working channels.
2. PTT and release Radio 2 (high priority entry into the queue).
3. Declare an emergency on Radio 1 (medium priority entry into the queue but now at Emergency Priority).
4. Un-key Radio 4
   - Verify that Radio 1 un-queues and is assigned a channel without having to PTT. (Key the radio within the specified auto key time in order to keep the channel.)
5. Un-key all radios and clear the emergency with the Radio 1.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

10.16 Group Scan

Purpose: **Verify when scan is enabled, calls from groups in the radio's scan list are received.**

Expected Results: **In this test the radio will play calls from multiple talk groups while scan is enabled**

Setup: **All radios for this test need to have scan ability.**

Radio 1 set up with TG64001 P25 and TG64002 P25 in the scan list, TG64001 P25 selected, and Group scan initially disabled.

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64002 P25	64001

Execution:

1. Place a call from Radio 2 on talk TG64001 P25.
   - ☐ Verify the call is received and audio is heard on Radio 1.
2. Place a call from Radio 2 on talk TG64002 P25.
   - ☐ Verify the call is not received by Radio 1.
3. Enable group scan on Radio 1.
4. Place another call from Radio 2 on talk TG64002 P25.
   - ☐ Verify that the call is now received, and audio is heard on Radio 1.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

10.17 Priority Scan

Purpose: **Demonstrate groups assigned a higher priority in the scan list override groups of a lower priority.**

Expected Results: **Radio will play calls with a higher level of priority.**

Setup: Set Radio 1 to priority scan TG64001 P25, and scan (at lower priority – 3 bars) TG64002 P25. Set Radio 1 to TG64003. Have scan enabled on Radio 1.

Description	Radio LID	TG Description	TG ID
Radio 1 (SCAN)	9980001	TG 64003 P25	64003
Radio 2	9980002	TG 64002 P25	64002
Radio 3	9980003	TG 64001 P25	64001

Execution:

1. Have Radio 1 selected to TG64003 P25. Place a call from Radio 2 on TG64002 P25.
   - ☐ Verify Radio 1 scans to TG64002 P25 and hears audio from Radio 2. Continue transmitting from Radio 2.

2. Place a call from Radio 3 on TG64001 P25. [Radio 2 is still transmitting on TG64002 P25.]
   - ☐ Verify Radio 1 priority scans to TG64001 P25 and hears audio from Radio 3.

3. Unkey all radios and turn off scan.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

10.18 Transmit Busy Lockout

Purpose: **Demonstrate a radio cannot key on a group, on which a group call is already active.**

Expected Results: **A radio will not be allowed to transmit on a talk group while a different radio is transmitting on the same talk group.**

Setup: **Talk group used for test must be set up as Transmission Trunked. This feature does not apply to Message Trunked calls.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64001 P25	64001

.

Execution:

1. Place a call from Radio 1 on selected talk group by pressing and holding the PTT button.

   - Verify the call is received and audio is heard on Radio 2.

2. While the call is in progress, press the PTT button on Radio 2.

   - Verify that Radio 2 does not transmit over (step on) the call-in progress. (A double bump busy sound will be heard).

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

10.19 Continuous Control Channel Update

Purpose: **This test will demonstrate that a radio will join a call that is already in progress**

Expected Results: **This test will verify that a radio will join a call that is already in progress.**

Setup:

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64001 P25	64001

Execution:

1. Set both radios to the test group.
2. Turn radio 2 OFF.
3. Key radio 1 and hold. Turn ON the radio 2 (and set it to the test group if necessary).
   - ☐ Verify that the second radio joins the call-in progress and hears audio from the call-in progress.
4. Unkey radio 1.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

10.20 Convert Too Callee

Purpose: **Demonstrate when radios are simultaneously keyed, only one radio is given talk privilege.**

Expected Results: **When two radios on the same talkgroup are keyed simultaneously, only one radio will receive access to the working channel. The other radio will play the audio from the first.**

Setup: **Test of single site simultaneous call arbitration.**
Radio 1 and Radio 2 are registered on the same site and TG.

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64001 P25	64001

Execution:

1. Set two radios to the same site and group.
2. Key both radios at the same time.
   - ☐ Verify that one radio ends up transmitting and the other ends up receiving.
   - ☐ Verify that the call audio is routed and received by one of the units even though the PTT is pressed.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

10.21 Multi-site Routing (for Multi-Site Logout)

Purpose: **Demonstrate the system will not route a call to a site if all the radios logged into the site have moved to a different site.**

Expected Results: **When the radio moves away from a site, the system will not route calls to the site that it has roamed away from.**

Setup: **Site 1 and 2 should be selected such that Radio 2 can log into Site 1 and then Site 2. If coverage prevents this, then program a third radio with the ID of Radio 2. Use the third radio to key on Site 1 with the ID of Radio 2 whenever the test procedure calls for this. The primary objective of this test is to demonstrate that the system routes calls to Site 2 whenever a unit (i.e. radio 2) is logged onto Site 2 and does not route calls to Site 2 when no units are logged into Site 2. Radio 1 logged in to Site 1 and Radio 2 logged into Site 2.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG641001 P25	64001
Radio 2	998002	TG641001 P25	64001

Execution:

1. Key Radio 1 on Site 1.
   - ☐ Verify channel assignments occur on Site 2. Un-key radio.
2. Switch Radio 2 to site 1.
3. Key Radio 1 on site 1.
   - ☐ Verify no channel assignment on site 2

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

10.22 Site Trunking (Failsoft) Indication

Purpose: **Demonstrate that radio displays a Failsoft Icon, when the site is unable to communicate with the system/network.**

Expected Results: **This test will verify that the radio will display an 'F' when the site it is logged into is not connected to the system.**

Setup: **Radios must be programmed to display Failsoft.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID	Site #
Radio 1	998001	TG641001 P25	64001	1
Radio 2	998002	TG641001 P25	64001	1
Radio 3	998003	TG641001 P25	64001	2

Execution:

1. PTT Radio 1

   ☐ Verify that the Radio 1, Radio 2, and Radio 3 can communicate on the system.

2. Disconnect the network connection from the Network Switching Center to the Site Router, causing loss of communication from the site back to the Network Switching Center.

   ☐ Verify that Radio 1 and Radio 2 indicate a Failsoft alarm ("F") on their displays this may take several minutes.

3. PTT Radio 1 on Talkgroup A. Verify audio is heard at Radio 2. Verify audio is not heard on Radio 3.

4. Re-connect the network from the Network Switching Center to the Site Router.

   ☐ Verify the Failsoft alarm disappears on the radios and that communications with Radio 3 is reestablished.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

10.23 Unconfirmed Call (Multisite Late-Enter)

Purpose: **Verify a radio will late enter an ongoing group call made from another site.**

Expected Results: **A radio creates demand for talkgroups even when no channels are available at a site. Ongoing calls on a talkgroup will be joined as channel resources become available.**

Setup: **Site 1 should only have one working channel, disable all other working channels at site 1.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID	Site #
Radio 1	998001	TG64001 P25	64001	1
Radio 2	998002	TG64002 P25	64002	1
Radio 3	998003	TG64001 P25	64001	2
Radio 4	998004	TG64001 P25	64001	2

Execution:

1. Key up radio 2 on site 1 and hold the call up.

2. Key up Radio 3 on TG64001 on Site 2 and hold the call up.
   - ☐ Verify that Radio 3 should get the grant tone and the call should go through to Radio 4 on Site 2.
   - ☐ Since Site 1 has no channels available, the call should not go through to Radio 1 on Site 1.

3. While Radio 2 is still keyed up, free up a channel on Site 1 by unkeying radio 2.
   - ☐ Verify that the call gets routed to Site 1 and that Radio 1 late-enters into the call on that site.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

10.24 Confirmed Call [Non- Single Cell Simulcast/Multisite Only]

Purpose: **This test will demonstrate that the system will allow confirmed calls.**

Expected Results: **When a radio attempts PTT it will get a wait tone until there are available channels at all site that have demand for the call, or the confirmed call timer expires.**

Setup: **Additional radios maybe required for this test, this test requires two more radios than the number of channels available at the site to be tested.**

Site 1 should only have one working channel, disable all other working channels at site 1.

Radio Description	Radio Lid	Talk Group Description	Talk Group ID	Site #
Radio 1	998001	TG64001 P25	64101	1
Radio 2	998002	TG64002 P25	64002	1
Radio 3	998003	TG64001 P25	64101	2
Radio 4	998004	TG64001 P25	64101	2

Execution:

1. Key up Radio 2 on site 1 and hold the call up.

2. Key up Radio 3 on TG64001 on Site 2 and hold the call up.
   - The call will not be granted because there are no available channels on site 1.

3. Hold the call up until the confirmed call timer expires.
   - Once the timer expires the call will go through but only to site 2 only

4. While Radio 2 is still keyed up, free up a channel on Site 1 by unkeying radio 2.
   - Verify that the call gets routed to Site 1 and that Radio 1 late-enters into the call.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

10.25 Roaming (ProRoam) [This needs work before Final] [Field Only Test] [Non- Single Cell Simulcast/Multisite Only]

Purpose: **This test will demonstrate the system ability to direct the radios to adjacent sites Control Channels.**

Expected Results: **As the signal quality degrades the radio will scan the adjacent Control Channels and log on to adjacent available Control Channel.**

Setup: **The two radios used for this test must be capable (feature encrypted) and programmed for ProRoam. The radios must be valid on the two sites (Site 1 and Site 2) being used to conduct the tests. Site 1 and Site 2 should have overlapping coverage to verify Priority System Scan (if tested). Verify that the Tone Suppress Option is not selected in the personality so that an audible tone can be heard once the radios switch systems. Program both radios for Dynamic Scan mode. To test Priority System Scan (a.k.a., Preferred Site), ensure only Radio 1 has one of the sites (Site 1) used for the test as its Priority System. Have Radio 2's Priority System Scan site set to a site not near the sites used in this test (i.e., not Site 1 or Site 2). Note that the display and indications of each model of radio differ. This test describes the general procedure for ProRoam Roaming. Refer to the specific radio operator's manual or the ProRoam Release Notes for details. Log Radio 1 and Radio 2 onto the Site 1 used for this test. Ensure the radios are communicating on this system.**

Execution:

1. Start with both radios at site 1.

2. Begin traveling toward an area where the coverage from Site 2 is stronger than the coverage from Site 1.

3. As you travel away from site 1 and towards site 2, the signal quality will deteriorate. Once the signal level of Site 2 exceeds the programmed ProRoam parameters in the personality
   - Radio 1 and Radio 2 will switch to the Site 2.
   - The radios will generate audible tones and will visually indicate that they have switched to Site 2 Cell.
   - After the radios have both switched to the Site 2 Cell, verify communications continue.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

10.26 Priority System Scan (Preferred Site) [Field Only Test] [Non- Single Cell Simulcast/Multisite Only]

Purpose: **This test will demonstrate the radios ability to prefer one site over another site.**

Expected Results: **As the signal degrades the radio will switch to the preferred site even though the signal strength of the preferred site is lower than the non-preferred site.**

Setup: **The two radios used for this test must be capable (feature encrypted) and programmed for ProRoam. The radios must be valid on the two sites (Site 1 and Site 2) being used to conduct the tests. Site 1 and Site 2 should have overlapping coverage to verify Priority System Scan (if tested). Verify that the Tone Suppress Option is not selected in the personality so that an audible tone can be heard once the radios switch systems. Program both radios for Dynamic Scan mode. Static works. To test Priority System Scan (a.k.a., Preferred Site), ensure only Radio 1 has one of the sites (Site 1) used for the test as its Priority System. Have Radio 2's Priority System Scan site set to a site not near the sites used in this test (i.e., not Site 1 or Site 2). Note that the display and indications of each model of radio differ. This test describes the general procedure for ProRoam Roaming. Refer to the specific radio operator's manual or the ProRoam Release Notes for details. Log Radio 1 and Radio 2 onto the Site 1 used for this test. Ensure the radios are communicating on this system.**

Execution:

1. Continued from Roaming test.
2. Begin slowly travelling from Site 2 back to the coverage of Site 1.
3. As you travel from Site 2 back to Site 1, Radio 1 will log back onto Site 1 (its Priority System) as soon as an acceptable signal is available, even if Site 2 has a stronger signal.
4. Radio 2 will roam onto Site 1 only when its signal is stronger than the signal of Site 2.
   - ☐ Verify that Radio 1 scans back to Site 1 sooner than does Radio 2.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

11. EMERGENCY IN 10A.2

11.1 Local Emergency Multisite on 10A.2 System FDMA [Non- Single Cell Simulcast/Multisite Only]

Purpose: **This test is set up to demonstrate the multisite FDMA emergency.**

Expected Results: **This test will verify that the system will not drop a channel to assign a channel an emergency in FMDA mode.**

Setup: **This test requires six radios and two working talk paths on the site. Disable channels (if necessary) until there is only two working talk paths on the site.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID	Site #
Radio 1	9980001	TG64101 P25	64101	1
Radio 2	9980002	TG64102 P25	64102	1
Radio 3	9980003	TG64103 P25	64103	1
Radio 4	9980004	TG64101 P25	64101	2
Radio 5	9980005	TG64102 P25	64102	2
Radio 6	9980006	TG64103 P25	64103	2

Execution:

1. Disable channels at site 1 and 2 so that only the site only has two working FDMA talk paths.
2. PTT Radio 1 & 2 to busy up the sites.
3. Declare an emergency on Radio 3.
   - Radio 3 Should enter the Queue.
4. Un-key Radio 4
   - Verify Radio is assigned the call
5. Un-key all radios and clear the emergency with the Radio 1.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

11.2 Local Emergency Multisite on 10A.2 System TDMA

Purpose: **This test is set up to demonstrate the multisite TDMA local emergency.**

Expected Results: **This test will verify that the system will drop a local channel to assign a channel an emergency in TDMA mode.**

Setup: **This test requires six radios and two working talk paths on the site. Disable channels (if necessary) until there is only two working talk paths on the site.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID	Site #
Radio 1	9980001	TG64151 P25	64151	1
Radio 2	9980002	TG64152 P25	64152	1
Radio 3	9980003	TG64153 P25	64153	1
Radio 4	9980004	TG64151 P25	64151	2
Radio 5	9980005	TG64152 P25	64152	2
Radio 6	9980006	TG64153 P25	64153	2

Execution:

1. Disable channels at site 1 and 2 so that only the site only has two working TDMA talk paths.
2. PTT Radio 1 & 2 to busy up the sites.
3. Declare an emergency on Radio 3.
   - ☐ Verify call is dropped to Radio 1 and tone is heard
   - ☐ Verify Radio 3 is assigned a channel / one TDMA slot.
   - ☐ Verify a console hears calls from Radio 2 and 3
4. Un-key all radios and clear the emergency with the Radio 1.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

11.3 Remote Emergency Multisite on 10A.2 System TDMA

Purpose: **This test is set up to demonstrate the multisite TDMA local emergency.**

Expected Results: **This test will verify that the system will not drop a remote channel to assign a channel an emergency in TDMA mode.**

Setup: **This test requires six radios and two working talk paths on the site. Disable channels (if necessary) until there is only two working talk paths on the site.**

Description	Radio LID	TG Description	TG ID	Site
Radio 1	9980001	TG 64151 P25	64151	1
Radio 2	9980002	TG 64152 P25	64152	1
Radio 3	9980003	TG 64153 P25	64153	1
Radio 4	9980004	TG 64151 P25	64151	2
Radio 5	9980005	TG 64152 P25	64152	2
Radio 6	9980006	TG 64153 P25	64153	2

Execution:

1. Disable channels at site 1 and 2 so that only the site only has two working TDMA talk paths.
2. PTT Radio 4 & 5 to busy up the sites.
3. Declare an emergency on Radio 3.
   - ☐ Verify audio is dropped to Radio 1
   - ☐ Verify calls from radio 4 and 5 continue
   - ☐ Verify Radio 3 is assigned a channel
   - ☐ Verify a console hears calls from Radio 3, 4 and 5
4. Un-key all radios and clear the emergency with the Radio 1.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

12. TRANSCODER TEST

Purpose: **This test will demonstrate the transcoder ability to transcode calls made with different vocoders**

Expected Results: **This test will verify that the transcoder is needed to transcode a call, and each transcoder will transcode calls.**

Setup:

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	9980001	TG 64400OS	64400
Console 9110	9989110	TG 64400OS	64400

Execution:

1. Shutdown s0u1xcda.vida.local, s0u2xcda.vida.local and s0u1xcdb.vida.local.

Transcoder	State
s0u1xcda.vida.local	Off
s0u2xcda.vida.local	Off
s0u1xcdb.vida.local	Off

2. From the console place a call on talk group 64400OS
   - Verify that the call is not heard on a P25 radio on talk group 6400OS, this called failed because there is no working transcoder.

3. Restart s0u1xcda.vida.local.

Transcoder	State
s0u1xcda.vida.local	On
s0u2xcda.vida.local	Off
s0u1xcdb.vida.local	Off

4. From the console place a call on talk group 64400OS
   - Verify that the call is heard on a P25 radio

5. Restart s0u2xcda.vida.local wait for 15 minutes for services to start

6. Shutdown s0u1xcda.vida.local.

Transcoder	State
s0u1xcda.vida.local	Off
s0u2xcda.vida.local	On
s0u1xcdb.vida.local	Off

7. From the console place a call on talk group 64400OS
   - Verify that the call is heard on a P25 radio on talk group 6400OS this call is using s0u2xcda.vida.local.

8. Restart s0u1xcdb.vida.local

9. Shutdown s0u1xcda.vida.local

Transcoder	State
s0u1xcda.vida.local	Off
s0u2xcda.vida.local	Off
s0u1xcdb.vida.local	On

10. From the console place a call on talk group 64400OS
    - Verify that the call is heard on a P25 radio on talk group 6400OS this call is using s0u3xcda.vida.local.

11. Restart s0u2xcda.vida.local and s0u1xcda.vida.local

12. From the console place a call on talk group 64400OS verify that the call is heard on a P25 radio on talk group 6400OS

Transcoder	State
s0u1xcda.vida.local	On
s0u2xcda.vida.local	On
s0u1xcdb.vida.local	On

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

13. P25 PHASE 2 FUNCTIONALITY (Single Site/Simulcast Single Site)

Purpose: **The tests below verify that the P25 Phase 2 implementation provides the additional traffic channel capacity and features of P25 Phase 2 while allowing backwards compatibility with Phase 1 radios and talkgroups.**

Expected Results: **This will verify that a P25 Phase 1 call will work on a Phase 2 system**

Setup: **In the following tests, portables 1 and 2 will be set up as Phase 1 only. Portables 3 and 4 will be set up as Phase 2 and Phase 1 capable, depending upon talk-group. FDMA refers to Phase 1 and TDMA refers to Phase 2. Start a session on the RNM and setup to watch channel assignments using the real-time viewer function.**

On a client computer, open the windows internet explorer and browse to https://s0u1rnm.vida.local/nmc and log in with an Active Directory account. Choose the system map and select the 'Launch Application' button. Open the Realtime tab and Click Site Calls. Select the site and expand. Check the box next to the channels and select the to add the channels to the target list. Select the 'ok' button to launch the application. Place a group call from Radio 1 to Radio 2 on the site and verify that the event viewer displays the talkgroup ID and calling party ID. Verify the state changes from Free to Talk. Verify the TG Alias displays the Group #.

Radio Description	Radio Lid	Talk Group Description	Talk Group ID	System
Radio 1	998001	TG64051 P25	64051	MAC PH 1
Radio 2	998002	TG64051 P25	64051	MAC PH 1
Radio 3	998003	TG64051 P25	64051	MAC PH 2
Radio 4	998004	TG64051 P25	64051	MAC PH 2

13.1 Mixed Mode site to Mixed Mode Site Call Phase 1- Phase 1

Purpose: **Demonstrates that a Phase 1 call will work on a Phase 2 system**

Expected Results: **This will verify that a P25 Phase 1 call will work on a Phase 2 system**

Setup: **Turn off radios 3 and 4.**

Execution:

1. PTT Radio 1 and talk. The transmit (TX) indicators should turn on at Radio 1

   - ☐ Verify that the call is assigned as an FDMA by viewing the Real Time Viewer Site Activity on the RNM.

   - ☐ Verify Radios 2 can hear Radio 1.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

13.2 Mixed Mode site to Mixed Mode Site Call - Phase 1 and Phase 2

Purpose: **Demonstrates that a mixed mode call can function on a Phase 2 system**

Expected Results: **This test will verify that a Phase 2 radio will hear a call from a Phase 1 radio.**

Setup: **Turn on Radios 1, 2, 3, 4**

Execution:

1. PTT Radio 1 and talk. The transmit (TX) indicators should turn on at Radio 1

   - ☐ Verify that the call is assigned as an FDMA by viewing the Real Time Viewer Site Activity on the RNM.

   - ☐ Verify Radios 2, 3 and 4 can hear Radio 1.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

13.3 Mixed Mode site to Mixed Mode Site Call - Phase 1

Purpose: **Demonstrates that a mixed mode call can function on a Phase 2 system**

Expected Results: **This test will verify that a Phase 1 radio will hear a call from a Phase 2 radio.**

Setup: **Turn on Radios 1, 2, 3, 4**

Execution:

1. PTT Radio 3 and talk. The transmit (TX) indicators should turn on at Radio 3

   - ☐ Verify that the call is assigned as an FDMA by viewing the Real Time Viewer Site Activity on the RNM.

   - ☐ Verify Radios 1, 2 and 4 can hear Radio 3.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

13.4 Phase 2 site Call

Purpose: **Demonstrates that a Phase 2 call work on a Phase 2 system**

Expected Results: **This will verify that a P25 Phase 2 call will work on a Phase 2 system**

Setup: **Turn off Radios 1, and 2**

Execution:

1. PTT Radio 3 and talk. The transmit (TX) indicators should turn on at Radio 3

   - ☐ Verify that the call is assigned as an TDMA by viewing the Real Time Viewer Site Activity on the RNM.

   - ☐ Verify Radios 4 can hear Radio 1.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

14. P25 PHASE 2 FUNCTIONALITY [Non- Single Cell Simulcast/Multisite Only]

Purpose: **The tests will show that the system will allow radios that are on different sites to communicate while the radios are on different phases on P25.**

Expected Results: **This test will verify that the system will allow Phase 1 and Phase 2 radio to inter communicate.**

Setup: **In the following tests, portables 1 and 2 will be set up as Phase 1 only. Portables 3 and 4 will be set up as Phase 2 and Phase 1 capable, depending upon talk-group. FDMA refers to Phase 1 and TDMA refers to Phase 2. Start a session on the RNM and setup to watch channel assignments using the real-time viewer function.**

On a client computer, open the windows internet explorer and browse to https://s0u1rnm.vida.local/nmc and log in with an Active Directory account. Choose the system map and select the 'Launch Application' button. Open the Realtime tab and Click Site Calls. Select the site and expand. Check the box next to the channels and select the to add the channels to the target list. Select the 'ok' button to launch the application.

Place a group call from Radio 1 to Radio 2 on the site and verify that the event viewer displays the talk-group ID and calling party ID. Verify the state changes from Free to Talk. Verify the TG Alias displays the Group #.

Radio Description	Radio Lid	Talk Group Description	Talk Group ID	System	Site	On/Off
Radio 1	998001	TG64051 P25	64051	MAC PH 1	1	On
Radio 2	998002	TG64051 P25	64051	MAC PH 1	1	On
Radio 3	998003	TG64051 P25	64051	MAC PH 2	2	On
Radio 4	998004	TG64051 P25	64051	MAC PH 2	2	On

14.1 Mixed Mode site to Mixed Mode Site Call Phase 1- Phase 1 [Non- Single Cell Simulcast/Multisite Only]

Purpose: **Demonstrates that a Phase 1 call work on a Phase 2 system**

Expected Results: **This will verify that a P25 Phase 1 call will work on a Phase 2 system**

Setup: **Turn off radios 2 and 4.**

Description	Radio LID	TG Description	TG ID	System	Site	On/Off
Radio 1	9980001	TG 64051 P25	64051	MAC PH 1	1	On
Radio 2	9980002	TG 64051 P25	64052	MAC PH 2	1	Off
Radio 3	9980003	TG 64051 P25	64051	MAC PH 1	2	On
Radio 4	9980004	TG 64051 P25	64052	MAC PH 2	2	Off

Execution:

1. PTT Radio 1 and talk.

   - ☐ The transmit (TX) indicators should turn on at Radio 1
   - ☐ Verify that the call is assigned as FDMA at Site 2 by viewing the Real Time Viewer Site Activity on the RNM.
   - ☐ Verify Radio 3 can hear Radio 1.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

14.2 Mixed Mode site to Mixed Mode Site Call - Phase 1 and Phase 2 [Non- Single Cell Simulcast/Multisite Only]

Purpose: **Demonstrates that a mixed mode call can function on a Phase 2 system**

Expected Results: **This test will verify that Phase 2 radios will hear a call from a Phase 1 radio.**

Setup: **Turn on Radios 1, 2, 3, 4**

Description	Radio LID	TG Description	TG ID	System	Site	On/Off
Radio 1	9980001	TG 64051 P25	64051	MAC PH 1	1	On
Radio 2	9980002	TG 64051 P25	64051	MAC PH 1	1	On
Radio 3	9980003	TG 64051 P25	64051	MAC PH 2	2	On
Radio 4	9980004	TG 64051 P25	64051	MAC PH 2	2	On

Execution:

1. PTT Radio 1 and talk.

   - ☐ The transmit (TX) indicators should turn on at Radio 1
   - ☐ Verify that the call is assigned as an FDMA at site 2 by viewing the Real Time Viewer Site Activity on the RNM.
   - ☐ Verify Radios 2, 3 and 4 can hear Radio 1.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

14.3 Mixed Mode site to Mixed Mode Site Call - Phase 1 [Non- Single Cell Simulcast/Multisite Only]

Purpose: **Demonstrates that a mixed mode call can function on a Phase 2 system.**

Expected Results: **This test will verify that a Phase 1 radio will hear a call from a Phase 2 radio.**

Setup: **Turn on Radios 1, 2, 3, 4**

Description	Radio LID	TG Description	TG ID	System	Site	On/Off
Radio 1	9980001	TG 64051 P25	64051	MAC PH 1	1	On
Radio 2	9980002	TG 64051 P25	64051	MAC PH 1	1	On
Radio 3	9980003	TG 64051 P25	64051	MAC PH 2	2	On
Radio 4	9980004	TG 64051 P25	64051	MAC PH 2	2	On

Execution:

1. PTT Radio 3 and talk.

   - ☐ The transmit (TX) indicators should turn on at Radio 3
   - ☐ Verify that the call is assigned as an FDMA at site 2 by viewing the Real Time Viewer Site Activity on the RNM.
   - ☐ Verify Radios 1, 2 and 4 can hear Radio 3.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

14.4 Phase 2 site Call [Non- Single Cell Simulcast/Multisite Only]

Purpose: **Demonstrate that a Phase 2 call works on a Phase 2 system.**

Expected Results: **Verify that a P25 Phase 2 call will work on a Phase 2 system.**

Setup: **Turn off Radios 1 and 2**

Description	Radio LID	TG Description	TG ID	System	Site	On/Off
Radio 1	9980001	TG 64051 P25	64051	MAC PH 1	1	Off
Radio 2	9980002	TG 64051 P25	64051	MAC PH 1	1	Off
Radio 3	9980003	TG 64051 P25	64051	MAC PH 2	2	On
Radio 4	9980004	TG 64051 P25	64051	MAC PH 2	1	On

Execution:

1. PTT Radio 3 and talk.

   - ☐ The transmit (TX) indicators should turn on at Radio 3
   - ☐ Verify that the call is assigned as a TDMA at Site 1 by viewing the Real Time Viewer Site Activity on the RNM.
   - ☐ Verify Radios 1, 2, & 4 can hear Radio 3.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

15. SYMPHONY DISPATCH FEATURE SET

All Testing done in this section should be done with a user that is in the 'Console' User Group.

15.1 Transmitting With a Microphone (Group Calls, I Calls)

Purpose: **Confirms the console operator can initiate communication with a terminal radio using the console select functions and foot pedal, for both Group and I Calls.**

Expected Results: **Confirms communication with the terminal radio**

Setup: **Radio set to TG64001 P25 and console programmed with talk groupTG64001 P25**

Execution:

1. Press the INSTANT TX function (for example right mouse button) on the module with the test group. Verify
   - ☐ that a channel access tone is heard, a
   - ☐ ripple effect on the 'TX' indicator is displayed
   - ☐ that the call is heard on the radio.
2. Release the Instant TX key
3. Right click on the gear symbol for TG64002 and select 'Select' to make TG64002 the selected talk group. Verify
   - ☐ that the module for TG64002 is highlighted indicating that it is the selected talk group
   - ☐ the module at the top center of the screen changes to 'TG64002'
4. Make call on 64002TG by:
   a. Press the PTT foot pedal.
      - ☐ verify that a channel access tone is heard,
      - ☐ the halo around the 'TX' indicator is displayed
      - ☐ that the call is heard on the radio
      - ☐ verify audio is head at a radio on talk group 64002TG

      i. Release the foot pedal to end the call

b. Press the headset button.

- ☐ verify that a channel access tone is heard
- ☐ the halo around the 'TX' indicator is displayed
- ☐ that the call is heard on the radio
- ☐ verify audio is head at a radio on talk group 64002TG

i. Release the headset button to end the call.

c. Select the 64002TG button with the mouse.

- ☐ verify that a channel access tone is heard
- ☐ the halo around the 'TX' indicator is displayed
- ☐ that the call is heard on the radio
- ☐ verify audio is head at a radio on talk group 64002TG

i. Release the mouse button to end the call.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

15.2 Receiving Calls (Unit ID Display, Talk group ID Display, Aliasing)

Purpose:	**Confirm the console operator can receive communications from a terminal radio, using both talkgroup and individual calling.**
Expected Results:	**Communications are initiated and received on the appropriate speaker (select or unselect) and the radio's ID is displayed.**
Setup:	**Console should have talk groups 64001TU and 64002TU programmed with 64002TU selected and Radio set to TG64001 P25**

15.2.1 Talk Group Call

Execution:

1. Key the radio and verify
   - ☐ That the call is heard at the unselect speaker
   - ☐ That the calling radio ID is displayed on the module for TG64001
   - ☐ A green light id displayed indicating an incoming call on module TG64001
2. Switch the radios talk group to 64002TU and key the radio.
   - ☐ That the call is heard at the select speaker
   - ☐ That the calling radio ID is displayed on the module for TG64002
   - ☐ A green light id displayed indicating an incoming call on module TG64002

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

15.2.2 Individual Call (Unit – Unit)

Execution:

1. Right click on the 'Harris' box on the top left-hand side of the screen.
2. Select 'Open Directory' this will open a pop-up window for the 'Directory'
3. Select the 'Users' tab
4. Select 'Radio 1' under the "ALIAS' column
5. Press the 'Radio 1' button the right side to the screen to place an individual call to radio 1.
   - ☐ Verify the ripple effect on the 'TX' indicator is displayed
   - ☐ Verify a ringing tone will be heard at the console and the radio
   - ☐ Verify radio displays 'INDV' and consoles 'ID"
6. Respond to the console by PTTing the radio
   - ☐ Verify that the call is heard on the console and that the calling radio's ID and the Call Indicator are displayed.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

15.3 Emergency Call and Emergency Alarm

Purpose: **Confirms the console indicates an emergency declared by a terminal radio and can reset and clear the emergency.**

Expected Results: **The console indicates and can clear the emergency.**

Setup: **This test requires a test radio capable of generating and clearing an emergency (i.e. Supervisor Radio).**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001

Execution:

1. Select the 64002TG in the console. Using the test radio, declare an emergency on 64001TG.
   - Verify the module for '64001TG' turns red,
   - Verify the ID/Name of the test radio is displayed
   - Verify emergency alert tone is heard on the console.
2. Select the triangle with a '!' to access the emergency menu.
   - the acknowledge 'Ack' button is red
   - the check box is red
3. Using the radio, transmit on the talk group
   - Verify that the call is received by the console.
4. With the console, transmit on the group with the emergency.
   - Verify the test radio receives the call and is still in emergency mode.
5. Acknowledge the emergency by selecting the 'Ack' button
   - Verify the button changes from 'Ack' to clear
   - verify the radio and the console are still in emergency mode
6. Clear the emergency by selecting the 'Clear X' button

- ☐ Verify the console clears the emergency
- ☐ Verify the radio clears the emergency

7. Transmit on the radio
8. Verify the emergency is cleared and normal group calls have resumed.
9. Select 64001TG group selected on the console, declare an emergency on the test group by pressing the 'Emer Declare'.
   - ☐ Verify the console and radio have the same indications as steps 2 to 4.
10. Acknowledge by hitting 'Ack' in step 4
11. Clear the emergency with the console.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

15.4 System Wide Call (All Call & Announcements)

Purpose: **Confirm the console can initiate system wide calls.**

Expected Results: **The console can initiate both All Calls and Announcement Calls.**

Setup: **Program console modules with the 'TG64000 P25' talk group**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64051 P25	64051
Radio 2	998002	TG64052 P25	64052
Radio 3	998003	TG64001 P25	64001
Radio 4	998004	TG64001 P25	64002

Execution:

1. Press INSTANT TX on the module with 'TG64000 P25'.
   - Verify that a channel access tone is heard,
   - Verify the ripple effect on the 'TX' indicator is displayed
   - Verify that the call is heard at all radios
2. Release the Instant TX key.
3. Press INSTANT TX on the module with 'TG64051 P25'.
   - Verify that a channel access tone is heard,
   - Verify the ripple effect is displayed
   - Verify the call is heard at Radios 1. Verify Radios 2, 3
   - Verify radio 4 did not hear the audio.
4. Release the Instant TX key.

5. Press INSTANT TX on the module with ‘TG64001 P25’.

   - Verify that a channel access tone is heard,
   - The ripple effect is displayed,
   - The call is heard at Radios 3.
   - Verify that Radios 1 2
   - Radio 4 did not hear the audio.

6. Release the Instant TX key.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

15.5 Alert Tones

Purpose: **Confirm the console can initiate alert tones which can be heard at the terminal radio.**

Expected Results: **The tones can be initiated and heard.**

Setup: **Console 1 programmed with TG64002 and TG64001 selected.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64002 P25	64002

Execution:

1. Make TG64001 P25 the selected talk group.
2. Select the tones tab on the talk group module.
3. Select one of the three ALERT TONE keys by selecting the drop-down list next to the orange button the console with a method other than the mouse.
4. Radio 1 will receive the call.
5. Test that all three alert tones can be heard on the radio.
   - ☐ Verify the ALERT TONE is received by Radio 1 and also heard on the console (to hear the tones on the console, press and hold the foot pedal and listen for the tone on the SELECT speaker).
6. When the ALERT TONE key is released
   - ☐ Verify the call on Radio 1 drops

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

15.6 Console Pre-Empt

Purpose: **Confirm the console can pre-empt an ongoing call between terminal radios.**

Expected Results: **The call started by the radio will be interrupted by the console.**

Setup: **Console 1 programmed with talk-group TG64001 P25**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	9981001	TG64001 P25	64001
Radio 2	9981002	TG64001 P25	64001

Execution:

1. Key Radio 1 on the TG64001 and hold the call up. Verify that audio is heard at Radio 2 and the console.

2. Key the console on TG64001and hold the while continuing to hold the call up on Radio 1

   - ☐ Verify the console pre-empts
   - ☐ Verify that the transmit indicator is displayed along with the pre-empted caller LID and CALL indicator
   - ☐ Verify that the second radio begins to hear the console audio and not the first radio call.
   - ☐ Verify that the pre-empted radio audio is still heard on the pre-empting console.

3. Un-key the first Radio.

   - ☐ Verify that the pre-empted caller LID and CALL indicators are removed, and the pre-empted radio audio is no longer heard on the pre-empting console.

4. Un-key the console.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

15.7 Simulselect

Purpose: **Confirms operation of the console Simulselect feature, which allows multiple talk groups to be selected for communication simultaneously.**

Expected Results: **The console can select multiple talk groups and communication is allowed.**

Setup **Console 1 programmed with talk groups TG64051 P25, TG64052 P25, TG64053 P25, and TG64054 P25.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64051 P25	64051
Radio 2	998002	TG64052 P25	64052
Radio 3	998003	TG64001 P25	64001
Radio 4	998004	TG64001 P25	64002

Execution:

1. Create simulselect group on the 4 test group modules
2. Place a call from the console on the simulselect group
   - ☐ Verify that the call is heard all four radios
3. Place a call from each radio
   - ☐ Verify that only the console hears the calls
   - ☐ Verify only the radios on similar talk groups here the call
4. Deactivate the simulselect group.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

15.8 Patch

Purpose: **Confirms the console patch feature creates shared communication between multiple selected talk groups.**

Expected Results: **The patched talk groups can communicate.**

Setup **Console 1 programmed with talk groups TG64051 P25, TG64052 P25, TG64053 P25, and TG64054 P25.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64051 P25	64051
Radio 2	998002	TG64052 P25	64052
Radio 3	998003	TG64001 P25	64001
Radio 4	998004	TG64001 P25	64002

Execution:

1. Create patch on PATCH 1 with all four groups above.
2. Place a call from the newly created patch
   - Verify that the call is heard on all the radios
3. Place a call from each radio
   - Verify that the call is heard on the console and each radio.
4. Deactivate the patch.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

15.9 Console to Console Cross-mute

Purpose: **Confirm creation of a cross-mute of another console to quiet the muted consoles audio on the local console.**

Expected Results: **The cross-muted console's audio cannot be heard on the local console.**

Setup: **Establish two consoles (A and B) to test the Crossmute function. The Consoles must be on the same NSC. Program and select a test group on both consoles.**

Execution:

1. Place a call on console A on the test group.
   - ☐ Verify that console B can hear console A.
2. Open the Symphony Configuration Utility for console B in the 'General' section add the ID for console A to the 'Cross Mute' list.
3. Select 'Apply' to save the changes.
4. Place a call on console A on the test group
   - ☐ Verify the call can't be heard at console B.
5. Restore the desired cross mute setup.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

15.10 Call History

Purpose: **Confirms a history of calls processed at the console.**

Expected Results: **The history is accessible and valid.**

Setup: **This test compares programmed module call activity to the history scroll lists. Utility page, dispatch menu will be selected. Select either the "Select History" or "Unselect History".**

Execution:

1. Press the 'Scroll Up' and 'Scroll Down' buttons to scroll through the Unselect call history list.
   - Compare these calls with known activity.
2. Press the 'Scroll Up' and 'Scroll Down' buttons to scroll through the selected call history list.
   - Compare these calls with known activity.
3. Press the 'Esc' button to exit the history scroll mode.
4. To monitor call history on a single group, use the 'module history' button on the 'module modify' menu.
5. Use the 'scroll up' and 'scroll down' buttons to scroll through the calls for the picked module.
   - Compare these calls with known activity.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

16. BEON FEATURES

Purpose: **These will test the BeOn features.**

Expected Results: **This test will demonstrate that BeOn works as designed.**

Setup: **This test will show that the BeOn system allows a smartphone to communicate with the radio system.**

16.1 Transmit Grant Tone

Purpose: **This test will demonstrate the grant tone on BeOn.**

Expected Results: **When the smartphone PTTs on the BeOn app it will play a grant tone.**

Setup: **Grant tone (Ready to Talk tone) enabled in smartphone radio personality.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
BeOn_202	998202	TG64151 P25	64151
BeOn_203	998203	TG64151 P25	64151
BeOn_204	998204	TG64151 P25	64151

Execution:

1. Press PTT button on smartphone with valid group selected.

   - Verify grant tone is heard at smartphone when working channel access is granted.

Note: If the call is queued, the grant tone will be delayed until the call is assigned a working channel.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

16.2 Group Call

Purpose: **Confirms the scan function which allows a smartphone to hear audio on selected talk-groups other than the current talk-group.**

Expected Results: **Selected talk-group call audio is heard.**

Setup: **Set smart-phones 1, 2, & 3 to (Group A) per test group structure. Make sure Scan is turned OFF.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
BeOn_202	998202	TG64151 P25	64151
BeOn_203	998203	TG64151 P25	64151
BeOn_204	998204	TG64151 P25	64151

Execution:

1. PTT on BeOn_202 and talk.
   - ☐ The transmit (TX) indicators should turn on at BeOn_202.
   - ☐ Audio should be heard in BeOn_203, and BeOn_204.
   - ☐ The ID of BeOn_202 should be seen at BeOn_203, and BeOn_204.
2. Set BeOn_204 to TG64152 P25. PTT on BeOn_202 and talk.
   - ☐ The transmit (TX) indicators should turn on at BeOn_202.
   - ☐ Audio should be heard in BeOn_203 only.
   - ☐ The ID of BeOn_202 should be seen at BeOn_203 only.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

16.3 Individual (Private) Call

Purpose: **Confirms individual calls can be initiated using BeOn enabled smartphones.**

Expected Results: **Individual calls are confirmed.**

Setup:

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
BeOn_202	998202	TG64151 P25	64151
BeOn_203	998203	TG64151 P25	64151
BeOn_204	998204	TG64151 P25	64151

Execution:

1. Using the BeOn_202, select the pre-stored ID of BeOn_203 or enter the BeOn_203 ID directly from the keypad, and PTT smartphone 1.

   - ☐ Verify that BeOn_203 receives the call and displays the ID of smartphone 1.
   - ☐ Verify that BeOn_204 remains idle.

2. Release the PTT on BeOn_202 and immediately PTT on BeOn_203.

   - ☐ Verify that BeOn_202 receives the call and displays the ID of BeOn_203.
   - ☐ Verify BeOn_204 remains idle.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

16.4 Group Scan

Purpose: **Confirms the scan function which allows a smartphone to hear audio on selected talk-groups other than the current talk-group.**

Expected Results: **Selected talk-group call audio is heard.**

Setup: **BeOn_202 set up with TG64151 P25 and TG64152 P25 in the scan list, TG64151 P25 selected, and group scan initially disabled.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
BeOn_202	998202	TG64151 P25	64151
BeOn_203	998203	TG64151 P25	64151
BeOn_204	998204	TG64151 P25	64151

Execution:

1. Place a call from BeOn_203 on TG64151 P25.
   - ☐ Verify the call is received and audio is heard on BeOn_202.
2. Place a call from BeOn_203 on TG64152 P25.
   - ☐ Verify the call is not received by BeOn_202.
3. Enable group scan on BeOn_202.
4. Place another call from BeOn_203 on TG64152 P25.
   - ☐ Verify that the call is now received, and audio is heard on BeOn_202.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

16.5 Emergency Group Call

Purpose: **Confirms an emergency can be declared, recognized and cleared by a smartphone.**

Expected Results: **The emergency is declared, recognized and cleared.**

Setup:

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
BeOn_202	998202	TG64151 P25	64151
BeOn_203	998203	TG64152 P25	64152
BeOn_204	998204	TG64153 P25	64153

Execution:

1. Press the Emergency call button on BeOn_204 and then PTT BeOn_204.

   - ☐ Verify that BeOn_204 indicates the “TX EMER” declaration and that it reverts to the home group.

   - ☐ Verify that BeOn_202 and BeOn_203 indicate a “RX EMER” and hear audio on the emergency home group.

2. Clear the emergency with the Supervisor smartphone (BeOn_202).

   - ☐ Verify the emergency clears in the smartphones.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

17. TRUNKED LOGGING RECORDER

17.1 Group Call

Purpose: **Confirms group call audio is captured, recorded and accessible on the logging recorder**

Expected Results: **Calls are captured, recorded and accessible.**

Setup:

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64051 P25	64051
Radio 2	998002	TG64051 P25	64051
Radio 3	998003	TG64051 P25	64051

1. PTT radio 1 and talk.

   - ☐ Audio should be heard on radio 2. Note the Start time of the call and the approximate duration.

2. Retrieve the call from the Logging Recorder.

   - ☐ Verify the Caller, Callee, Start Time, and duration.
   - ☐ The Caller should be the LID for Radio 1 and the Callee should be the GID for 64051. Verification should include the LID/GID and its Alias as defined by the UAS.
   - ☐ Verify that the call is identified as a Group Call.

3. Playback the audio

   - ☐ Confirm that the playback audio is all recorded and intelligible.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

17.2 Emergency Group Call

Purpose: **Confirms emergency group call audio is captured, recorded and accessible on the logging recorder**

Expected Results: **Calls are captured, recorded and accessible.**

Setup:

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64051 P25	64051
Radio 2	998002	TG64051 P25	64051
Radio 3	998003	TG64051 P25	64051

Execution:

1. Press the Emergency call button on radio 2. Talk during the Hot Mic transmit time.
2. Clear the emergency with the radio 1.
3. Retrieve the call from the Logging Recorder.

- ☐ Verify the Caller
- ☐ Verify the Callee
- ☐ Verify the start time
- ☐ Verify the duration
- ☐ The Caller should be the LID for Radio 2 and the Callee should be the GID for the Home Group.
- ☐ Verification should include the LID/GID and its Alias as defined by the UAS.
- ☐ Verify that the call is identified as an Emergency.
- ☐ Playback the audio and confirm that it is all recorded and intelligible.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

18. P25 SIMULCAST BYPASS OPERATION

Program the MASTR V modules (both Control Points and Transmit Sites) to the Final Configuration. Refer to the installation manual for the guide to setting TX Traffic Controllers / CP Traffic Controllers personality parameters.

Verify the BYPASS plan has been reviewed and approved by customer representative. This procedure makes assumptions on bypass sites before implementation and test of the System. After WMS/Panther signal strength data collection, final decision will be made on the actual bypass "ON" and "OFF" sites.

Prepare a minimum of two terminal radios programmed to operate on the active BYPASS site and the main simulcast system.

18.1 Site OFF - Final Configuration

Purpose: **Confirm sites configured to be in the "OFF" condition during BYPASS are in the expected BYPASS mode.**

Expected Results: **The "OFF" site traffic controllers have no control channel.**

Setup: **Sites intended to be "OFF" in event of BYPASS must have all channels set to disabled (unchecked in Device Manager, TC personality).**

Execution:

1. At one of the sites designated as an "off" site, create a condition to force BYPASS by disconnecting the router to MPLS connection. All other sites will have the HPAs disabled locally.
   - ☐ Verify transmit site is in BYPASS mode.
   - ☐ The Traffic Controller module display indicates "TC" instead of "TR". Note: TC= Working Traffic Channel, standalone mode, TR=Working Channel, simulcast mode, and Control Channel, simulcast mode is indicated by the transmit LED indicator.
2. Observe the repeater (station) Traffic Controller modules.
   - ☐ Verify there is no active control channel.
   - ☐ Verify no stations are keyed or producing RF power.
3. Restore the site to normal by returning the site to simulcast mode by reconnecting the router to MPLS connection.
   - ☐ Verify transmit site is in normal simulcast mode. The Traffic Controller modules will indicate "TR(n)", where n is the channel number.
4. Repeat steps 1-3 for the remaining "OFF" bypass sites in the simulcast system under test.

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

18.2 Site ON (trunking) - Final Configuration

Purpose: **Confirm sites configured to be in the "ON" condition during BYPASS are in the expected BYPASS mode.**

Expected Results: **The "ON" site traffic controllers have a control channel and calls to terminal radios can be initiated.**

Setup:

Execution:

1. Create a condition to force BYPASS by disconnecting the router to MPLS connection.
   - ☐ Verify transmit site is in BYPASS mode. BYPS LED on Baseband module and the Traffic Controller module display indicates either "TC" or "CC" instead of "TR.
   - ☐ Observe the stations/repeater Traffic Controller modules. Verify there is an active control channel on one of the Traffic Controller modules. The remaining repeater/stations Traffic Controller modules will indicate "TC".
   - ☐ Verify the station appearing as control channel is keyed, producing RF power and modulated with control channel data.
   - ☐ Verify a terminal radio set to the system programmed for the site in BYPASS with the correct site ID recognizes the site's control channel data.

2. Key the terminal radio on a group call.
   - ☐ Verify a working channel assignment is made within the channel group allowed in the personality.
   - ☐ Verify the call is heard on a second terminal radio set to the active BYPASS system.

3. Restore the site to simulcast mode by reconnecting the router to MPLS connection.
   - ☐ Verify transmit site is in normal simulcast mode. Traffic Controller modules indicate "TR(n).

4. Repeat steps 1-3 for the remaining "ON" bypass sites in the simulcast system under test.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

18.3 Control Point Trunking Reset Control

Purpose: **A properly set up Simulcast BYPASS system will disable CP Traffic Controller modules associated with active channels at a TX site operating in BYPASS. This keeps the remaining sites operating in Simulcast mode from being assigned to channels expected to be active at the site in BYPASS. Sites programmed to be OFF in BYPASS will not require any Traffic Controller modules to be held OFF.**

Expected Results: **This test will verify that the Control Point Traffic Controller modules will be held OFF corresponding to the active channels at a site as a result of the TX site being in BYPASS.**

Setup:

Execution:

1. Force a TX site that will become active into BYPASS by disconnecting the router to MPLS connection.

   - ☐ Verify TX site is in BYPASS mode.
   - ☐ Verify transmit site is in BYPASS mode. Traffic Controller module display indicates either “TC” or “CC” instead of “TR”.
   - ☐ Verify the CP Traffic Controller modules on the channels intended to be OFF are held OFF.

2. Observe the RNM screen for the simulcast system.

   - ☐ Verify the channels intended to be OFF at the Control Point are reported as OFF (RED).

3. Restore the site to simulcast mode by reconnecting the router to MPLS connection.

   - ☐ Verify the TX site Traffic Controller modules revert to normal Simulcast.

   - ☐ Verify the CP Traffic Controller modules associated with the site in BYPASS are returned to normal.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

18.4 Bypass – Site Minimum Channels

Purpose: **Confirm a site enters bypass when active channels fall below site minimum channels setting.**

Expected Results: **The site enters bypass mode.**

Setup: **Sites are configured with cluster minimum channels set to 6 and site minimum channels to 7.**

Bypass Plan: TR Site 1 Ch 3,4,5; TR Site 2 Ch 6,7,8; TR site 3 Ch 9,10,11 TR Sites 4 and 5 dark

Note **Settings and bypass plan can be customer final settings; execution will have to adjust to accommodate those settings.**

Execution:

1. At TR site 1 disable channels 8 - 11 using the TX disable switch on the PA (only channels 1-7 are still functioning).
   - ☐ Verify system and site still functioning in simulcast; the disabled channels 8-11 are in alarm state at the control point site.
   - ☐ At TR site 1 the Traffic Controller modules displays still indicates “TR” not “TC” or “CC”. Note: TC= Working Traffic Channel, standalone mode, TR=Working Channel, simulcast mode, and Control Channel, simulcast mode is indicated by the transmit LED indicator.

2. At the same site disable channel 7 using the TX disable switch on the PA.
   - ☐ Verify system is still functioning in simulcast. Control Point ch 3,4 and 5 in alarm state.
   - ☐ Verify TR site 1 is in bypass. The Traffic Controller module display indicates “TC” instead of “TR”. All channels status indicates alarm. Note: TC= Working Traffic Channel, standalone mode, TR=Working Channel, simulcast mode, and Control Channel, simulcast mode is indicated by the transmit LED indicator always on.

3. At the same site restore all channels back to service (enable the PA using the TX disable switch on the PA).
   - ☐ Verify transmit site 1 is in normal simulcast mode. The Traffic Controller modules will indicate “TR(n)”, where n is the channel number.
   - ☐ Verify all channels are in service at the control point.

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

18.5 Bypass – Cluster Minimum Channels – TR site failures

Purpose: **Confirm all sites enter bypass when available channels fall below the cluster minimum channels setting. Depending upon the system size, bypass plan and which channels have been failed a subset of sites may subsequently come out of bypass and operate as a cluster before any channels are restored to service.**

Expected Results: All site in the system enter bypass mode.

Setup: **Sites are configured with cluster minimum channels set to 6 and site minimum channels set to 7 (these settings are normally lower; they are set high to simplify testing).**

Execution:

1. At TR site 1 disable channels 9, 10 and 11 using the TX disable switch on the PA (8 channels are still functioning.

   - ☐ Verify system and site still functioning in simulcast.

   - ☐ The Traffic Controller module displays still indicates “TR” not “TC” or “CC”. Note: TC= Working Traffic Channel, standalone mode, TR=Working Channel, simulcast mode, and Control Channel, simulcast mode is indicated by the transmit LED indicator.

2. At TR site 3 disable channels 6, 7 and 8 using the TX disable switch on the PA (5 channels are still functioning).

   - ☐ Verify All sites have entered bypass (the TCs display “TC” and “CC”, not “TR” and every channel status indicates failed at every site.

3. Enable the PAs at the sites using the TX disable switches.

   - ☐ Verify the system recovers to simulcast mode with all transmit sites in normal simulcast mode. The Traffic Controller modules will indicate “TR(n)”, where n is the channel number.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

18.6 Site ON (trunking) - Enhanced Bypass Final Configuration

Purpose: **Confirm sites configured to be in the "ON" condition during BYPASS are in the expected BYPASS mode and can connect to VNIC.**

Expected Results: **The "ON" site traffic controllers have a control channel and calls between terminal radios and dispatch can be made.**

Setup:

Execution:

1. Create a condition to force BYPASS that does not disrupt network connectivity by logging into both GPS receivers and configuring their notifications to set the major alarm threshold to minimum satellites 12 and duration below threshold 5 seconds. This will cause the GPS receivers to set a major alarm after 5 seconds.

2. Configure Notifications from Spectracom GPS Receivers

Navigate to: **Management → Notifications**

2. In the **Events** window pane, click the **GPS** tab.
3. Set the Major Alarm Threshold as follows:
   a. Minimum Satellites: **12**
   b. Duration Below Threshold: **5**
4. Click: **[Submit]**

3. Verify transmit site is in BYPASS mode. The Traffic Controller module display indicates either “TC” or “CC” instead of “TR”.

    - ☐ Observe the stations/repeater Traffic Controller modules. Verify there is an active control channel on one of the Traffic Controller modules. The remaining repeater/stations Traffic Controller modules will indicate “TC”.

    - ☐ Verify the station appearing as control channel is keyed, producing RF power and modulated with control channel data.

    - ☐ Verify a terminal radio set to the system programmed for the site in BYPASS with the correct site ID recognizes the site’s control channel data.

4. Key the terminal radio on a group call.

    - ☐ Verify a working channel assignment is made within the channel group allowed in the personality.

5. Restore the site to simulcast mode by restoring the GPS major alarm notification threshold to minimum satellites = 1 and duration = 345600 for both GPS receivers.

    - ☐ Verify transmit site is in normal simulcast mode. Traffic Controller modules indicate “TR(n).

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

19. VIDA INTER-OPERABILITY GATEWAY TEST

19.1 Local Interoperability

Purpose: **The purpose of this test is to verify correct functionality of the Interoperability Gateway.**

Expected Results: **Verify that the**

Setup: **The Interoperability Gateway connects via 4-wire audio connections in its Universal Access Cards(UAC) cards to interoperability radio units (mobile or desktop). The Gateway also connects to a router and the Network Switching Center (NSC) to provide call functionality across the network.**

Execution:

1. Select Inter-op group 1 on the radio.
2. Initiate a call from the radio to group 1
   - ☐ Verify that audio is heard on inter-op group 1 radio.
3. Initiate a call from the inter-op group 1 radio to group 1
   - ☐ Verify that audio is heard on the radio.

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

20. INFORMATION ASSURANCE TESTING

20.1 Active Directory

Purpose: **The purpose of this test is to view the GPO structure on an Active Directory server.**

Expected Results: **The GPO structure is valid.**

Setup: **None**

Execution:

1. Log into an Active Directory Server.
2. Open AD Users/Groups
   - Validate that the computers have been added to AD.
3. Open Group Policies Management
   - Verify VIDA GPO Structure

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

20.2 Cisco Works

Purpose: **This test will test the Cisco Works.**

Expected Results: **This test will verify that the Cisco Works is communicating with the necessary devices.**

Setup: **The purpose of this test is to verify that Cisco Works is configured and is capable of accessing the Cisco devices on the network.**

Execution:

1. Use Internet Explorer on a client PC to browse to CiscoWorks
2. Select ‘RME’
3. Expand ‘Devices’
4. Select ‘Inventory’
5. Select ‘View Inventory Connection Status’
6. Select the number on Inventory Collected
7. Select a device
8. Expand ‘All Devices’
9. Select a device
10. Select ‘Cisco View’
11. Select a port
12. Select ‘Configure’
13. Click on a Device
    - View ‘Configuration’
14. Close windows and log out

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

20.3 ePolicy Orchestrator

Purpose: **The purpose of this test is to verify that ePolicy Orchestrator is communicating with its end devices and that it will report actions that have been taken by McAfee Antivirus on a remote computer.**

Expected Results: **ePolicy Orchestrator is accessible and displays valid reporting.**

Setup: **None**

Execution:

1. Use Internet Explorer on a client PC to navigate to the McAfee E-Policy Orchestrator server
2. Log in using proper credentials
3. Go to the Main Screen
   - ☐ Verify all servers have been added to policies.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

20.4 Backup

Purpose: **The purpose of this test is to verify that the Unitrends server has a schedule for performing backups of network computers and that it can display the backup status of those computers**

Expected Results: **The test will verify that the backup is configured.**

Setup: **None**

Execution:

1. Use Internet Explorer on a client PC to navigate to the Unitrends Backup UAC
2. Log in using proper log in credentials
3. Go to the Main Screen
   - Verify that devices are visible, and backups are configured.

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

20.5 Intrusion Detection

Purpose: **The purpose of this test is to verify that the Sourcefire Defense Center is communicating with its IDS sensors at remote sites across the network.**

Expected Results: **Sourcefire Defense Center is communicating with its IDS sensors.**

Setup: **None**

Execution:

1. Use Internet Explorer on a client PC to navigate to the Sourcefire Defense Center
2. Log in using proper credentials
3. Go to Defense Center Dashboard
4. Click Operations. Go to Sensors
   - ☐ Verify that all Sensors are visible.

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

20.6 SysLog

Purpose: **The purpose of this test is to verify that network devices are sending SysLog messages to the LogLogic server.**

Expected Results: **This test will verify that the clients are reporting to the Log Logic.**

Setup: **None**

Execution:

1. Use Internet Explorer on a client PC to navigate to the LogLogic Syslog web page
2. Log in using proper log in credentials
3. Go to LogLogic System Status Dashboard
4. Click Log Source Status
   - ☐ Verify current devices are reporting.

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

20.7 SUMS

Purpose: **To demonstrate that the SUMS server is communicating with the remote client.**

Expected Results: **This test will verify that the SUMS server is communicating with the remote clients and that the remote clients are updated.**

Setup: **None**

Execution:

1. Log into the SUMS server and launch the 'IBM Endpoint Manager Console' and log into the console with the SUMS administers user.

2. Expand 'Sites' 'Custom Sites' 'Vida' and select 'Subscribed Computers'

   - ☐ Verify that each Computer is listed, in the Subscribed Computers window
   - ☐ Check to make sure that each computer has reported to the SUMS server with in the last 30 minutes by checking the 'Last Report Time' column.
   - ☐ To check to make sure all the Subscriber Computers are update by selecting the 'Baseline' in the left-hand window.
   - ☐ Make sure the 'Baseline' window is empty or all computer in the window are gray.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

21. ACTION ITEMS

Test #	Page #	Action/Issue
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
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_____	_____	_____
_____	_____	_____

22. ACRONYMS AND DEFINITIONS

AD	Active Directory
AES	Advanced Encryption Standard
Confirmed Call	A confirmed call is a special type of call where the call is queued until all sites have resources available, or until the confirmed call timer expires (configurable, typically one or two seconds)
DM	Device Manager
DNS	Domain Name Server
FDMA	Frequency Division Multiple Access
FIPS 140-2	Federal Information Processing Standard, publication 140-2. The title is “Security Requirements for Cryptographic Modules”
FM	Frequency Modulation
HA	High Availability
IFW	Internet Firewall
Individual Call	An individual call is a private call between one user and another. It can be between two radios, or between one radio and a dispatch console
IP	Internet Protocol
IPS	Intrusion Prevention System
ISSI	Inter Sub System Interface. This is the interface between WACNs, in the Harris architecture an interface between a VNIC and a foreign P25 system
KEK	Key Encryption Key
KID	16-bit Encryption Key ID
KMF	Key Management Facility
LED	Light Emitting Diode
MASTR V	A Harris base station product

MDIS	Mobile Data Intermediate System, a Harris data switch used in Harris' OpenSky Architecture
MES	Mobile End System, a subscriber radio
MME	Miniature Mobility Exchange, which consists of Harris software running on a SitePro card at the base site. The MME runs the SNDCP layer of the data protocol and is the equivalent of the P25 RFG (RF Gateway)
NSC	Network Switching Center
NSS	Network Switching Server
NWS	Network Sentry
OTAP	Over The Air Programming
OTAR	Over The Air Rekeying
P25	Project 25, a suite of standards for digital radio communications, developed by the Association of Public Safety Communications Officials (APCO) under the TIA TR-8 engineering committee, and published as the TIA-102 set of documents
Priority Talkgroup	The priority talkgroup selected on the subscriber device. Usually this is the talkgroup that the radio will transmit on when the user presses PTT
ProFile	A Harris product used for configuring radios over the P25 radio channel
ProScan	A Harris software algorithm used for radio roaming
PSAP	Public Safety Access Point, usually an agency dispatch center
PSTN	Public Switched Telephone Network
PTT	Push To Talk
RAR	Regional Access Router
RF	Radio Frequency
RFW	Regional Firewall
RMS	Regional Management Server

RNM	Regional Network Manager
RS	Reed Solomon, a form of error detection and correction coding
RSM	Regional Site Manager, a server which runs the RSM, Activity Warehouse and Device Manager applications
SACCH	Slow Associated Control Channel (Phase 2)
SAN	Storage Area Network
Sourcefire DFC	Defense Center
SS	Status Symbol (a two-bit field in the control channel, used for channel access control signaling)
SSL	Secure Socket Layers
SSH	Secure Shell is a program to log into another computer over a network, to execute commands in a remote machine, and to move files from one machine to another. It provides strong authentication and secure communications over insecure channels. It is a replacement for rlogin, rsh, rcp, and rdist.
SUMS	Security Update Management Service (a Harris product)
System ID	The System ID is a 12-bit field of the network address which identifies the VNIC
TAC	Technical Assistance Center, a Harris service
TACACS	Terminal Access Controller Access Control System
TDMA	Time Division Multiple Access
TDU	Terminator Data Unit, used to terminate a voice message
TEK	Traffic Encryption Key
Telnet	A terminal emulation program for TCP/IP networks such as the Internet. The Telnet program runs on your computer and connects your PC to a server on the network.
TGID	Talkgroup ID (16-bit, equivalent to GID). The P25 documents usually use GID but some of the older documents use TGID
Traffic Controller	Software entity which resides in a base station at the site and generates the P25 control channel

TRC	Tone Remote Control
TSBK	Trunking Signaling Block (a 196-bit field in the control channel)
Tx	Transmit
UAC	Unified Audio Card
UAS	Unified Administration Server
UID	Unified ID. This is a Harris specific acronym referring to an ID composed of the System ID and SID. The UID is a ten-digit number in the form 604-415-4003, representing region, agency, and individual
Unitrends	Enterprise backup for VIDA networks
UPS	Uninterrupted Power Supply
VAS	VIDA Application Server
VCE	VIDA Console Exchange
VCH	Voice Channel (Phase 2)
VDOC	Voice and Data on Control (the control channel can assign itself as a traffic channel)
VIDA	Voice, Interoperability, Data, Access (a Harris system product)
VME	Versa Module Eurocard (IEEE 1014)
VNIC	Voice Network Interface Controller, the Harris voice switch
VTI	VIDA Telephone Interconnect
WACN	Wide Area Communication Network (20-bit network ID, part of SUID). This is a customer network which can include many VNICs
Zeroize	A P25 control channel command which causes the mobile radio to erase its encryption keys (but then requires manual loading to restore encryption keys)

23. UAS DATA BASE

23.1 Subscriber Units

Region Id	Agency Id	P25 IP Address	OpenSky IP Address	Description	Electronic Serial Number	Protocol Mask	Status	Sub Type	Assigned End User	Algorithm Support
10	998		10.128.111.19	OS_Radio_19	0	OpenSky	Enabled Unit			
10	998		10.128.111.20	OS_Radio_20	0	OpenSky	Enabled Unit			
10	998		10.128.111.2	OS_Radio_02	0	OpenSky	Enabled Unit			
10	998		10.128.111.3	OS_Radio_03	0	OpenSky	Enabled Unit			
10	998		10.128.111.4	OS_Radio_04	0	OpenSky	Enabled Unit			
10	998		10.128.111.5	OS_Radio_05	0	OpenSky	Enabled Unit			
10	998		10.128.111.6	OS_Radio_06	0	OpenSky	Enabled Unit			
10	998		10.128.111.7	OS_Radio_07	0	OpenSky	Enabled Unit			
10	998		10.128.111.8	OS_Radio_08	0	OpenSky	Enabled Unit			
10	998		10.128.111.9	OS_Radio_09	0	OpenSky	Enabled Unit			
10	998		10.128.111.10	OS_Radio_10	0	OpenSky	Enabled Unit			
10	998		10.128.111.11	OS_Radio_11	0	OpenSky	Enabled Unit			

10	998		10.128.111.12	OS_Radio_12	0	OpenSky	Enabled Unit			
10	998		10.128.111.13	OS_Radio_13	0	OpenSky	Enabled Unit			
10	998		10.128.111.14	OS_Radio_14	0	OpenSky	Enabled Unit			
10	998		10.128.111.15	OS_Radio_15	0	OpenSky	Enabled Unit			
10	998		10.128.111.16	OS_Radio_16	0	OpenSky	Enabled Unit			
10	998		10.128.111.1	OS_Radio_1	0	OpenSky	Enabled Unit			
10	998		10.128.111.17	OS_Radio_17	0	OpenSky	Enabled Unit			
10	998		10.128.111.18	OS_Radio_18	0	OpenSky	Enabled Unit			
10	998	10.128.79.9		Radio9	109980009	P25	Enabled Unit	Harris XG-75 Portable	010:998:0009	AES
10	998	10.128.79.10		Radio10	109980010	P25	Enabled Unit	Harris XG-75 Portable	010:998:0010	AES
10	998	10.128.79.8		Radio8	109980008	P25	Enabled Unit	Harris XG-75 Portable	010:998:0008	AES
10	998	10.128.53.1		Console9101	109989101	P25	Enabled Unit	Maestro Console	010:998:9101	AES
10	998	10.128.53.2		Console 9102	109989102	P25	Enabled Unit	Maestro Console	010:998:9102	Both
10	998	10.128.79.1		Radio1	109980001	P25	Enabled Unit	Harris P5400	010:998:0001	AES
10	998	10.128.79.2		Radio2	109980002	P25	Enabled Unit	Harris P5400	010:998:0002	AES
10	998	10.128.79.3		Radio3	109980003	P25	Enabled Unit	Harris XG-75 Portable	010:998:0003	AES
10	998	10.128.79.4		Radio4	109980004	P25	Enabled Unit	Harris XG-75 Portable	010:998:0004	AES

10	998	10.128.79.5	Radio5	109980005	P25	Enabled Unit	Harris XG-75 Portable	010:998:0005	AES
10	998	10.128.79.6	Radio6	109980006	P25	Enabled Unit	Harris XG-75 Portable	010:998:0006	AES
10	998	10.128.79.7	Radio7	109980007	P25	Enabled Unit	Harris XG-75 Portable	010:998:0007	AES
10	998	10.128.79.11	Radio11	109980011	P25	Enabled Unit	Harris UNITY XG-100P	010:998:0011	AES
10	998	10.128.79.12	Radio12	109980012	P25	Enabled Unit	Harris UNITY XG-100P	010:998:0012	AES
10	998	10.128.1.161	s0u1xcda	0	P25	Enabled Unit		010:998:9001	AES
10	998	10.128.1.162	s0u1xcdb	0	P25	Enabled Unit		010:998:9005	AES

23.2 Voice End Users

Region Id	Agency Id	User Id	Name	Description	Personality	User Privilege	Message Trunked ICall	Enable P25 AES OTAR	Manually-Keyed	Preferred Vocoder	Transcoding Allowed Flag
10	998	010:998:9921	VAQ-SS22	SiteSim VAQ User22	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0210	BeOn_210	BeOn_210	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9012	XCD_9012	XCD_9012	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9014	XCD_9014	XCD_9014	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:7005	VTI_7005	VTI_7005	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9909	VAQ-SS10	SiteSim VAQ User10	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9926	VAQ-SS27	SiteSim VAQ User27	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9905	VAQ-SS06	SiteSim VAQ User06	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0202	BeOn_202	BeOn_202	BeOn_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9925	VAQ-SS26	SiteSim VAQ User26	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0015	U9980015	U9980015	OS_Pers	998_10_default	TRUE	FALSE	FALSE	OpenSky 2400 AMBE+2	TRUE

10	998	010:998:00 16	U9980016	U9980016	OS_Pers	998_10_default	TRUE	FALSE	FALSE	OpenSky 2400 AMBE+2	TRUE
10	998	010:998:99 15	VAQ-SS16	SiteSim VAQ User16	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:99 03	VAQ-SS04	SiteSim VAQ User04	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:99 18	VAQ-SS19	SiteSim VAQ User19	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:99 04	VAQ-SS05	SiteSim VAQ User05	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:99 20	VAQ-SS21	SiteSim VAQ User21	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:99 07	VAQ-SS08	SiteSim VAQ User08	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:00 03	U9980003	U9980003	Pers1	998_10_default	TRUE	TRUE	FALSE	P25 Full Rate	TRUE
10	998	010:998:99 19	VAQ-SS20	SiteSim VAQ User20	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:99 11	VAQ-SS12	SiteSim VAQ User12	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:00 17	U9980017	U9980017	OS_Pers	998_10_default	TRUE	FALSE	FALSE	OpenSky 2400 AMBE+2	TRUE
10	998	010:998:00 08	U9980008	U9980008	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:99 01	VAQ-SS02	SiteSim VAQ User02	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE

10	998	010:998:0208	BeOn_208	BeOn_208	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9927	VAQ-SS28	SiteSim VAQ User28	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:7009	VTI_7009	VTI_7009	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9004	XCD_9004	XCD_9004	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9006	XCD_9006	XCD_9006	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9007	XCD_9007	XCD_9007	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0005	U9980005	U9980005	Pers1	998_10_default	TRUE	TRUE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9002	XCD_9002	XCD_9002	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:7002	VTI_7002	VTI_7002	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9906	VAQ-SS07	SiteSim VAQ User07	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9922	VAQ-SS23	SiteSim VAQ User23	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:7001	VTI_7001	VTI_7001	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0207	BeOn_207	BeOn_207	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE

10	998	010:998:9010	XCD_9010	XCD_9010	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9929	VAQ-SS30	SiteSim VAQ User30	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:7004	VTI_7004	VTI_7004	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9018	XCD_9018	XCD_9018	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0013	U9980013	U9980013	OS_Pers	998_10_default	TRUE	FALSE	FALSE	OpenSky 2400 AMBE+2	TRUE
10	998	010:998:7006	VTI_7006	VTI_7006	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9016	XCD_9016	XCD_9016	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9009	XCD_9009	XCD_9009	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:6005	Site5VirtualUser	Site5VirtualUser	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0006	U9980006	U9980006	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9011	XCD_9011	XCD_9011	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9013	XCD_9013	XCD_9013	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0007	U9980007	U9980007	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE

10	998	010:998:0206	BeOn_206	BeOn_206	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9019	XCD_9019	XCD_9019	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9917	VAQ-SS18	SiteSim VAQ User18	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9908	VAQ-SS09	SiteSim VAQ User09	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0004	U9980004	U9980004	Pers1	998_10_default	TRUE	TRUE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9005	XCD_9005	XCD_9005	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9900	VAQ-SS01	SiteSim VAQ User01	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9003	XCD_9003	XCD_9003	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9928	VAQ-SS29	SiteSim VAQ User29	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9923	VAQ-SS24	SiteSim VAQ User24	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0011	U9980011	U9980011	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0010	U9980010	U9980010	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9916	VAQ-SS17	SiteSim VAQ User17	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE

10	998	010:998:9008	XCD_9008	XCD_9008	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9017	XCD_9017	XCD_9017	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0205	BeOn_205	BeOn_205	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0201	BeOn_201	BeOn_201	BeOn_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9001	XCD_9001	XCD_9001	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0209	BeOn_209	BeOn_209	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0204	BeOn_204	BeOn_204	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9914	VAQ-SS15	SiteSim VAQ User15	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9103	U9980003	U9980003	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:7007	VTI_7007	VTI_7007	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:7010	VTI_7010	VTI_7010	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0009	U9980009	U9980009	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9924	VAQ-SS25	SiteSim VAQ User25	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE

10	998	010:998:7008	VTI_7008	VTI_7008	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0002	U9980002	U9980002	Pers1	998_10_default	TRUE	TRUE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0012	U9980012	U9980012	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0014	U9980014	U9980014	OS_Pers	998_10_default	TRUE	FALSE	FALSE	OpenSky 2400 AMBE+2	TRUE
10	998	010:998:9912	VAQ-SS13	SiteSim VAQ User13	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:6003	Site3VirtualUser	Site3VirtualUser	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9902	VAQ-SS03	SiteSim VAQ User03	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0203	BeOn_203	BeOn_203	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9015	XCD_9015	XCD_9015	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9913	VAQ-SS14	SiteSim VAQ User14	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:7003	VTI_7003	VTI_7003	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9910	VAQ-SS11	SiteSim VAQ User11	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:6004	Site4VirtualUser	Site4VirtualUser	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE

10	998	010:998:9101	Cons9101	Console 9101	Pers1	998_10_supervisor	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0001	U9980001	U9980001	Pers1	998_10_supervisor	TRUE	TRUE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9102	Cons9102	Console 9102	Pers1	998_10_supervisor	TRUE	FALSE	FALSE	P25 Full Rate	TRUE

23.3 Talk Groups

TG Id	Region Id	Agency Id	Name	Description	SPNI	Property Id	Priority Id	Coverage	Valid Coverage	Announcement Group	Test Partition Only	Type	Preferred Vocoder	ISSI Site	Transcoding Allowed
9900	10	998	PS-28-AN	VAQ SitSim01	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	Analog/ADPCM		TRUE
9901	10	998	Tone-25	VAQ SitSim02	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
9902	10	998	AmpFreq	VAQ SitSim03	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
9903	10	998	PseudSp	VAQ SitSim04	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
9904	10	998	Phrases	VAQ SitSim05	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
9905	10	998	SiteSm1	VAQ SitSim06	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
9906	10	998	SiteSm2	VAQ SitSim07	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
9907	10	998	SiteSm3	VAQ SitSim08	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE

9908	10	998	SiteSm 4	VAQ SitSim09	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
9909	10	998	SiteSm 5	VAQ SitSim10	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
9910	10	998	SiteSm 6	VAQ SitSim11	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
9911	10	998	T-25-HR	VAQ SitSim12	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Half Rate		TRUE
9912	10	998	AF-HR	VAQ SitSim13	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Half Rate		TRUE
9913	10	998	PSp-HR	VAQ SitSim14	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Half Rate		TRUE
9914	10	998	Phrs-HR	VAQ SitSim15	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Half Rate		TRUE
9915	10	998	T-25-AN	VAQ SitSim16	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	Analog/ADPCM		TRUE
9916	10	998	AF-AN	VAQ SitSim17	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	Analog/ADPCM		TRUE
9917	10	998	P-Sp-AN	VAQ SitSim18	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	Analog/ADPCM		TRUE

9918	10	998	Phrs-AN	VAQ SitSim19	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	Analog/ADPCM		TRUE
9919	10	998	VAQ20	VAQ SitSim20	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
9920	10	998	DVSITV	VAQ SitSim21	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Half Rate		TRUE
9921	10	998	T-25OS	VAQ SitSim22	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE		TRUE
9922	10	998	AF-OS	VAQ SitSim23	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE		TRUE
9923	10	998	P-SpOS	VAQ SitSim24	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE		TRUE
9924	10	998	PhrsOS	VAQ SitSim25	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE		TRUE
9925	10	998	T-25OS2	VAQ SitSim26	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE+2		TRUE
9926	10	998	AF-OS2	VAQ SitSim27	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE		TRUE
9927	10	998	P-SpOS2	VAQ SitSim28	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE+2		TRUE

9928	10	998	PhrsOS 2	VAQ SitSim29	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE+2		TRUE
9929	10	998	VAQ30	VAQ SitSim30	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
64000	10	998	64000 ALL	TG64000 P25 Full Rate All Call	1	3	7	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	All-Call	P25 Full Rate		FALSE
64001	10	998	64001 TUL	TG64001 TG64001 P25 Full Rate TX Unconf Low Priority	1	3	3	P25Sites_PSAPs	P25Sites_PSAPs	64007:64007ANN	FALSE	General	P25 Full Rate	010:Region 10--111:ISSI_SITE	TRUE
64002	10	998	64002 TUM	TG64002 P25 Full Rate TX Unconf Med Priority	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	64007:64007ANN	FALSE	General	P25 Full Rate	010:Region 10--111:ISSI_SITE	TRUE
64003	10	998	64003 TUM	TG64003 P25 Full Rate TX Unconf Med Priority	1	5	5	P25Sites_PSAPs	P25Sites_PSAPs	64007:64007ANN	FALSE	General	P25 Full Rate	010:Region 10--111:ISSI_SITE	TRUE
64004	10	998	64004 TUM	TG64004 P25 Full Rate TX Unconf Med Priority	1	4	5	P25Sites_PSAPs	P25Sites_PSAPs	64007:64007ANN	FALSE	General	P25 Full Rate	010:Region 10--111:ISSI_SITE	TRUE

64005	10	998	64005 TUM	TG64005 P25 Full Rate Msg Unconf Med Priority	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	64007:64007ANN	FALSE	General	P25 Full Rate	010:Region 10--111:ISSI_SITE	TRUE
64006	10	998	64006 TUH	TG64006 P25 Full Rate Msg Unconf High Priority	1	3	6	P25Sites_PSAPs	P25Sites_PSAPs	64007:64007ANN	FALSE	General	P25 Full Rate		TRUE
64007	10	998	64007 ANN	TG64007 P25 Full Rate Announcement	1	3	6	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	Announcement	P25 Full Rate		TRUE
64051	10	998	64051 TUL	TG64051 P25 Half Rate Low Priority	1	3	3	P25Sites_PSAPs	P25Sites_PSAPs	64057:64057ANN	FALSE	General	P25 Half Rate		TRUE
64052	10	998	64052 TUM	TG64052 P25 Half Rate Med Priority	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	64057:64057ANN	FALSE	General	P25 Half Rate		TRUE
64053	10	998	64053 TUM	TG64053 P25 Half Rate Med Priority	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	64057:64057ANN	FALSE	General	P25 Half Rate		TRUE
64054	10	998	64054 TUM	TG64054 P25 Half Rate Med Priority	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	64057:64057ANN	FALSE	General	P25 Half Rate		TRUE

64055	10	998	64055 TUM	TG64055 P25 Half Rate Med Priority	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	64057:64057ANN	FALSE	General	P25 Half Rate		TRUE
64056	10	998	64056 TUH	TG64056 P25 Half Rate High Priority	1	3	6	P25Sites_PSAPs	P25Sites_PSAPs	64057:64057ANN	FALSE	General	P25 Half Rate		TRUE
64057	10	998	64057 ANN	TG64057 P25 Half Rate Announcement	1	3	6	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	Announcement	P25 Half Rate		FALSE
64100	10	998	64100 ALL	TG64100 P25 Full Rate All Call	1	3	7	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	All-Call	P25 Full Rate		FALSE
64101	10	998	64101 TCL	TG64101 P25 Full Rate Conf Low Priority	1	4	3	P25Sites_PSAPs	P25Sites_PSAPs	64107:64107ANN	FALSE	General	P25 Full Rate		TRUE
64102	10	998	64102 TCM	TG64102 P25 Full Rate Conf Med Priority	1	4	5	P25Sites_PSAPs	P25Sites_PSAPs	64107:64107ANN	FALSE	General	P25 Full Rate		TRUE
64103	10	998	64103 TCM	TG64103 P25 Full Rate Conf Med Priority	1	4	5	P25Sites_PSAPs	P25Sites_PSAPs	64107:64107ANN	FALSE	General	P25 Full Rate		TRUE
64104	10	998	64104 TCM	TG64104 P25 Full Rate Conf Med Priority	1	4	5	P25Sites_PSAPs	P25Sites_PSAPs	64107:64107ANN	FALSE	General	P25 Full Rate		TRUE

64105	10	998	64105 TCM	TG64105 P25 Full Rate Conf Med Priority	1	4	5	P25Sites _PSAPs	P25Sites_ PSAPs	64107:64107ANN	FALSE	General	P25 Full Rate		TRUE
64106	10	998	64106 TCH	TG64106 P25 Full Rate Conf High Priority	1	4	6	P25Sites _PSAPs	P25Sites_ PSAPs	64107:64107ANN	FALSE	General	P25 Full Rate		TRUE
64107	10	998	64107 ANN	TG64107 P25 Full Rate Announcement	1	4	6	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	Announcement	P25 Full Rate		TRUE
64151	10	998	64151 TCL	TG64151 P25 Half Rate Low Priority	1	4	3	P25Sites _PSAPs	P25Sites_ PSAPs	64157:64157ANN	FALSE	General	P25 Half Rate		TRUE
64152	10	998	64152 TCM	TG64152 P25 Half Rate Med Priority	1	4	5	P25Sites _PSAPs	P25Sites_ PSAPs	64157:64157ANN	FALSE	General	P25 Half Rate		TRUE
64153	10	998	64153 TCM	TG64153 P25 Half Rate Med Priority	1	4	5	P25Sites _PSAPs	P25Sites_ PSAPs	64157:64157ANN	FALSE	General	P25 Half Rate		TRUE
64154	10	998	64154 TCM	TG64154 P25 Half Rate Med Priority	1	4	5	P25Sites _PSAPs	P25Sites_ PSAPs	64157:64157ANN	FALSE	General	P25 Half Rate		TRUE
64155	10	998	64155 TCM	TG64155 P25 Half Rate Med Priority	1	4	5	P25Sites _PSAPs	P25Sites_ PSAPs	64157:64157ANN	FALSE	General	P25 Half Rate		TRUE

64156	10	998	64156 TCH	TG64156 P25 Half Rate High Priority	1	4	6	P25Sites _PSAPs	P25Sites_ PSAPs	64157:64157ANN	FALSE	General	P25 Half Rate		TRUE
64157	10	998	64157 ANN	TG64157 P25 Half Rate Announcement	1	4	6	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	Announcement	P25 Half Rate		FALSE
64201	10	998	64201 TUE	TG64201 P25 Full Rate Unconf Encrypted	1	3	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	P25 Full Rate		TRUE
64202	10	998	64202 TUE	TG64202 P25 Full Rate Unconf Encrypted	1	3	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	P25 Full Rate		TRUE
64203	10	998	64203 TCE	TG64203 P25 Full Rate Conf Encrypted	1	4	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	P25 Full Rate		TRUE
64204	10	998	64204 TCE	TG64204 P25 Full Rate Conf Encrypted	1	4	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	P25 Full Rate		TRUE
64251	10	998	64251 TUE	TG64251 P25 Half Rate Unconf Encrypted	1	3	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	P25 Half Rate		TRUE
64252	10	998	64252 TUE	TG64252 P25 Half Rate Unconf Encrypted	1	3	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	P25 Half Rate		TRUE

64253	10	998	64253 TCE	TG64253 P25 Half Rate Conf Encrypted	1	4	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	P25 Half Rate		TRUE
64254	10	998	64254 TCE	TG64254 P25 Half Rate Conf Encrypted	1	4	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	P25 Half Rate		TRUE
64301	10	998	64301 MUM	TG64301 P25 Full Rate MT Unconf Med Priority	1	5	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	P25 Full Rate		TRUE
64302	10	998	64302 MUM	TG64302 P25 Full Rate MT Unconf Med Priority	1	5	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	P25 Full Rate		TRUE
64303	10	998	64303 MUM	TG64303 P25 Full Rate MT Unconf Med Priority	1	5	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	P25 Full Rate		TRUE
64304	10	998	64304 MUM	TG64304 P25 Full Rate MT Unconf Med Priority	1	5	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	P25 Full Rate		TRUE
64305	10	998	64305 MCM	TG64305 P25 Full Rate MT Conf Med Priority	1	6	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	P25 Full Rate		TRUE

64306	10	998	64306 MCM	TG64306 P25 Full Rate MT Conf Med Priority	1	6	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	Genera l	P25 Full Rate		TRUE
64307	10	998	64307 MCM	TG64307 P25 Full Rate MT Conf Med Priority	1	6	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	Genera l	P25 Full Rate		TRUE
64308	10	998	64308 MCM	TG64308 P25 Full Rate MT Conf Med Priority	1	6	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	Genera l	P25 Full Rate		TRUE
64351	10	998	64351 MUM	TG64351 P25 Half Rate MT Unconf Med Priority	1	5	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	Genera l	P25 Half Rate		TRUE
64352	10	998	64352 MUM	TG64352 P25 Half Rate MT Unconf Med Priority	1	5	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	Genera l	P25 Half Rate		TRUE
64353	10	998	64353 MUM	TG64353 P25 Half Rate MT Unconf Med Priority	1	5	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	Genera l	P25 Half Rate		TRUE
64354	10	998	64354 MUM	TG64354 P25 Half Rate MT	1	5	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	Genera l	P25 Half Rate		TRUE

				Unconf Med Priority											
64355	10	998	64355 MCM	TG64355 P25 Half Rate MT Conf Med Priority	1	6	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	P25 Half Rate		TRUE
64356	10	998	64356 MCM	TG64356 P25 Half Rate MT Conf Med Priority	1	6	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	P25 Half Rate		TRUE
64357	10	998	64357 MCM	TG64357 P25 Half Rate MT Conf Med Priority	1	6	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	P25 Half Rate		TRUE
64358	10	998	64358 MCM	TG64358 P25 Half Rate MT Conf Med Priority	1	6	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	P25 Half Rate		TRUE
64400	10	998	64400 OSTUH	TG64400 OS AMBE TX Unconf High Priority	1	3	6	AllRegs:AllSites:AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE+2		TRUE
64401	10	998	64401 OSTUM	TG64401 OS AMBE TX Unconf Med Priority	1	3	5	AllRegs:AllSites:AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE+2		TRUE
64402	10	998	64402 OSTUM	TG64402 OS AMBE TX	1	3	5	AllRegs:AllSites:AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE+2		TRUE

				Unconf Med Priority											
64403	10	998	64403 OSTUM	TG64403 OS AMBE MT Unconf Med Priority	1	5	5	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE+2		TRUE
64404	10	998	64404 OSTUL	TG64404 OS AMBE TX Unconf Low Priority	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE+2		TRUE
64450	10	998	64450 ANA	TG64450 Analog ADPCM Med Priority	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	IP Console Intercom	Analog/ADPCM		TRUE
64451	10	998	64451 ANA	TG64451 Analog ADPCM Med Priority	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	Analog/ADPCM		TRUE
64452	10	998	64452 ANA	TG64452 Analog ADPCM Med Priority	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	Analog/ADPCM		TRUE
64453	10	998	64453 ANA	TG64453 Analog ADPCM Med Priority	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	Analog/ADPCM		TRUE
9900	10	998	PS-28-AN	VAQ SitSim01	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	Analog/ADPCM		TRUE

9901	10	998	Tone-25	VAQSitSim02	1	3	3	AllRegs:AllSites:AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
9902	10	998	AmpFreq	VAQSitSim03	1	3	3	AllRegs:AllSites:AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
9903	10	998	PseudSp	VAQSitSim04	1	3	3	AllRegs:AllSites:AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
9904	10	998	Phrases	VAQSitSim05	1	3	3	AllRegs:AllSites:AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
9905	10	998	SiteSm1	VAQSitSim06	1	3	3	AllRegs:AllSites:AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
9906	10	998	SiteSm2	VAQSitSim07	1	3	3	AllRegs:AllSites:AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
9907	10	998	SiteSm3	VAQSitSim08	1	3	3	AllRegs:AllSites:AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
9908	10	998	SiteSm4	VAQSitSim09	1	3	3	AllRegs:AllSites:AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
9909	10	998	SiteSm5	VAQSitSim10	1	3	3	AllRegs:AllSites:AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
9910	10	998	SiteSm6	VAQSitSim11	1	3	3	AllRegs:AllSites:AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE

9911	10	998	T-25-HR	VAQ SitSim12	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Half Rate		TRUE
9912	10	998	AF-HR	VAQ SitSim13	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Half Rate		TRUE
9913	10	998	PSp-HR	VAQ SitSim14	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Half Rate		TRUE
9914	10	998	Phrs-HR	VAQ SitSim15	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Half Rate		TRUE
9915	10	998	T-25-AN	VAQ SitSim16	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	Analog/ADP CM		TRUE
9916	10	998	AF-AN	VAQ SitSim17	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	Analog/ADP CM		TRUE
9917	10	998	P-Sp-AN	VAQ SitSim18	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	Analog/ADP CM		TRUE
9918	10	998	Phrs-AN	VAQ SitSim19	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	Analog/ADP CM		TRUE
9919	10	998	VAQ20	VAQ SitSim20	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
9920	10	998	DVSITV	VAQ SitSim21	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Half Rate		TRUE

9921	10	998	T-25OS	VAQ SitSim22	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE		TRUE
9922	10	998	AF-OS	VAQ SitSim23	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE		TRUE
9923	10	998	P-SpOS	VAQ SitSim24	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE		TRUE
9924	10	998	PhrsOS	VAQ SitSim25	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE		TRUE
9925	10	998	T-25OS2	VAQ SitSim26	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE+2		TRUE
9926	10	998	AF-OS2	VAQ SitSim27	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE		TRUE
9927	10	998	P-SpOS2	VAQ SitSim28	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE+2		TRUE
9928	10	998	PhrsOS2	VAQ SitSim29	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE+2		TRUE
9929	10	998	VAQ30	VAQ SitSim30	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
64000	10	998	64000 ALL	TG64000 P25 Full Rate All Call	1	3	7	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	All-Call	P25 Full Rate		FALSE

64001	10	998	64001 TUL	TG64001 TG64001 P25 Full Rate TX Unconf Low Priority	1	3	3	P25Sites _PSAPs	P25Sites_ PSAPs	64007:64007A NN	FALSE	Genera l	P25 Full Rate	010:R egion 10-- 111:IS SI_SIT E	TRUE
64002	10	998	64002 TUM	TG64002 P25 Full Rate TX Unconf Med Priority	1	3	5	P25Sites _PSAPs	P25Sites_ PSAPs	64007:64007A NN	FALSE	Genera l	P25 Full Rate	010:R egion 10-- 111:IS SI_SIT E	TRUE
64003	10	998	64003 TUM	TG64003 P25 Full Rate TX Unconf Med Priority	1	5	5	P25Sites _PSAPs	P25Sites_ PSAPs	64007:64007A NN	FALSE	Genera l	P25 Full Rate	010:R egion 10-- 111:IS SI_SIT E	TRUE
64004	10	998	64004 TUM	TG64004 P25 Full Rate TX Unconf Med Priority	1	4	5	P25Sites _PSAPs	P25Sites_ PSAPs	64007:64007A NN	FALSE	Genera l	P25 Full Rate	010:R egion 10-- 111:IS SI_SIT E	TRUE
64005	10	998	64005 TUM	TG64005 P25 Full Rate Msg Unconf Med Priority	1	3	5	P25Sites _PSAPs	P25Sites_ PSAPs	64007:64007A NN	FALSE	Genera l	P25 Full Rate	010:R egion 10-- 111:IS SI_SIT E	TRUE
64006	10	998	64006 TUH	TG64006 P25 Full Rate Msg Unconf High Priority	1	3	6	P25Sites _PSAPs	P25Sites_ PSAPs	64007:64007A NN	FALSE	Genera l	P25 Full Rate		TRUE

64007	10	998	64007 ANN	TG64007 P25 Full Rate Announcement	1	3	6	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	Announcement	P25 Full Rate		TRUE
64051	10	998	64051 TUL	TG64051 P25 Half Rate Low Priority	1	3	3	P25Sites_PSAPs	P25Sites_PSAPs	64057:64057ANN	FALSE	General	P25 Half Rate		TRUE
64052	10	998	64052 TUM	TG64052 P25 Half Rate Med Priority	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	64057:64057ANN	FALSE	General	P25 Half Rate		TRUE
64053	10	998	64053 TUM	TG64053 P25 Half Rate Med Priority	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	64057:64057ANN	FALSE	General	P25 Half Rate		TRUE
64054	10	998	64054 TUM	TG64054 P25 Half Rate Med Priority	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	64057:64057ANN	FALSE	General	P25 Half Rate		TRUE
64055	10	998	64055 TUM	TG64055 P25 Half Rate Med Priority	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	64057:64057ANN	FALSE	General	P25 Half Rate		TRUE
64056	10	998	64056 TUH	TG64056 P25 Half Rate High Priority	1	3	6	P25Sites_PSAPs	P25Sites_PSAPs	64057:64057ANN	FALSE	General	P25 Half Rate		TRUE
64057	10	998	64057 ANN	TG64057 P25 Half Rate	1	3	6	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	Announcement	P25 Half Rate		FALSE

				Announcement											
64100	10	998	64100 ALL	TG64100 P25 Full Rate All Call	1	3	7	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	All-Call	P25 Full Rate		FALSE
64101	10	998	64101 TCL	TG64101 P25 Full Rate Conf Low Priority	1	4	3	P25Sites_PSAPs	P25Sites_PSAPs	64107:64107ANN	FALSE	General	P25 Full Rate		TRUE
64102	10	998	64102 TCM	TG64102 P25 Full Rate Conf Med Priority	1	4	5	P25Sites_PSAPs	P25Sites_PSAPs	64107:64107ANN	FALSE	General	P25 Full Rate		TRUE
64103	10	998	64103 TCM	TG64103 P25 Full Rate Conf Med Priority	1	4	5	P25Sites_PSAPs	P25Sites_PSAPs	64107:64107ANN	FALSE	General	P25 Full Rate		TRUE
64104	10	998	64104 TCM	TG64104 P25 Full Rate Conf Med Priority	1	4	5	P25Sites_PSAPs	P25Sites_PSAPs	64107:64107ANN	FALSE	General	P25 Full Rate		TRUE
64105	10	998	64105 TCM	TG64105 P25 Full Rate Conf Med Priority	1	4	5	P25Sites_PSAPs	P25Sites_PSAPs	64107:64107ANN	FALSE	General	P25 Full Rate		TRUE
64106	10	998	64106 TCH	TG64106 P25 Full Rate Conf High Priority	1	4	6	P25Sites_PSAPs	P25Sites_PSAPs	64107:64107ANN	FALSE	General	P25 Full Rate		TRUE
64107	10	998	64107 ANN	TG64107 P25 Full Rate	1	4	6	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	Announcement	P25 Full Rate		TRUE

				Announcement											
64151	10	998	64151 TCL	TG64151 P25 Half Rate Low Priority	1	4	3	P25Sites_PSAPs	P25Sites_PSAPs	64157:64157ANN	FALSE	General	P25 Half Rate		TRUE
64152	10	998	64152 TCM	TG64152 P25 Half Rate Med Priority	1	4	5	P25Sites_PSAPs	P25Sites_PSAPs	64157:64157ANN	FALSE	General	P25 Half Rate		TRUE
64153	10	998	64153 TCM	TG64153 P25 Half Rate Med Priority	1	4	5	P25Sites_PSAPs	P25Sites_PSAPs	64157:64157ANN	FALSE	General	P25 Half Rate		TRUE
64154	10	998	64154 TCM	TG64154 P25 Half Rate Med Priority	1	4	5	P25Sites_PSAPs	P25Sites_PSAPs	64157:64157ANN	FALSE	General	P25 Half Rate		TRUE
64155	10	998	64155 TCM	TG64155 P25 Half Rate Med Priority	1	4	5	P25Sites_PSAPs	P25Sites_PSAPs	64157:64157ANN	FALSE	General	P25 Half Rate		TRUE
64156	10	998	64156 TCH	TG64156 P25 Half Rate High Priority	1	4	6	P25Sites_PSAPs	P25Sites_PSAPs	64157:64157ANN	FALSE	General	P25 Half Rate		TRUE
64157	10	998	64157 ANN	TG64157 P25 Half Rate Announcement	1	4	6	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	Announcement	P25 Half Rate		FALSE

64201	10	998	64201 TUE	TG64201 P25 Full Rate Unconf Encrypted	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	P25 Full Rate		TRUE
64202	10	998	64202 TUE	TG64202 P25 Full Rate Unconf Encrypted	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	P25 Full Rate		TRUE
64203	10	998	64203 TCE	TG64203 P25 Full Rate Conf Encrypted	1	4	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	P25 Full Rate		TRUE
64204	10	998	64204 TCE	TG64204 P25 Full Rate Conf Encrypted	1	4	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	P25 Full Rate		TRUE
64251	10	998	64251 TUE	TG64251 P25 Half Rate Unconf Encrypted	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	P25 Half Rate		TRUE
64252	10	998	64252 TUE	TG64252 P25 Half Rate Unconf Encrypted	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	P25 Half Rate		TRUE
64253	10	998	64253 TCE	TG64253 P25 Half Rate Conf Encrypted	1	4	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	P25 Half Rate		TRUE
64254	10	998	64254 TCE	TG64254 P25 Half Rate Conf Encrypted	1	4	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	P25 Half Rate		TRUE

64301	10	998	64301 MUM	TG64301 P25 Full Rate MT Unconf Med Priority	1	5	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	P25 Full Rate		TRUE
64302	10	998	64302 MUM	TG64302 P25 Full Rate MT Unconf Med Priority	1	5	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	P25 Full Rate		TRUE
64303	10	998	64303 MUM	TG64303 P25 Full Rate MT Unconf Med Priority	1	5	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	P25 Full Rate		TRUE
64304	10	998	64304 MUM	TG64304 P25 Full Rate MT Unconf Med Priority	1	5	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	P25 Full Rate		TRUE
64305	10	998	64305 MCM	TG64305 P25 Full Rate MT Conf Med Priority	1	6	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	P25 Full Rate		TRUE
64306	10	998	64306 MCM	TG64306 P25 Full Rate MT Conf Med Priority	1	6	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	P25 Full Rate		TRUE
64307	10	998	64307 MCM	TG64307 P25 Full Rate MT	1	6	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	P25 Full Rate		TRUE

				Conf Med Priority											
64308	10	998	64308 MCM	TG64308 P25 Full Rate MT Conf Med Priority	1	6	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	P25 Full Rate		TRUE
64351	10	998	64351 MUM	TG64351 P25 Half Rate MT Unconf Med Priority	1	5	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	P25 Half Rate		TRUE
64352	10	998	64352 MUM	TG64352 P25 Half Rate MT Unconf Med Priority	1	5	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	P25 Half Rate		TRUE
64353	10	998	64353 MUM	TG64353 P25 Half Rate MT Unconf Med Priority	1	5	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	P25 Half Rate		TRUE
64354	10	998	64354 MUM	TG64354 P25 Half Rate MT Unconf Med Priority	1	5	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	P25 Half Rate		TRUE
64355	10	998	64355 MCM	TG64355 P25 Half Rate MT Conf Med Priority	1	6	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	P25 Half Rate		TRUE

64356	10	998	64356 MCM	TG64356 P25 Half Rate MT Conf Med Priority	1	6	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	P25 Half Rate		TRUE
64357	10	998	64357 MCM	TG64357 P25 Half Rate MT Conf Med Priority	1	6	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	P25 Half Rate		TRUE
64358	10	998	64358 MCM	TG64358 P25 Half Rate MT Conf Med Priority	1	6	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	P25 Half Rate		TRUE
64400	10	998	64400 OSTUH	TG64400 OS AMBE TX Unconf High Priority	1	3	6	AllRegs:AllSites:AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE+2		TRUE
64401	10	998	64401 OSTUM	TG64401 OS AMBE TX Unconf Med Priority	1	3	5	AllRegs:AllSites:AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE+2		TRUE
64402	10	998	64402 OSTUM	TG64402 OS AMBE TX Unconf Med Priority	1	3	5	AllRegs:AllSites:AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE+2		TRUE
64403	10	998	64403 OSTUM	TG64403 OS AMBE MT Unconf Med Priority	1	5	5	AllRegs:AllSites:AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE+2		TRUE

64404	10	998	64404 OSTUL	TG64404 OS AMBE TX Unconf Low Priority	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE+2		TRUE
64450	10	998	64450 ANA	TG64450 Analog ADPCM Med Priority	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	IP Console Intercom	Analog/ADPCM		TRUE
64451	10	998	64451 ANA	TG64451 Analog ADPCM Med Priority	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	Analog/ADPCM		TRUE
64452	10	998	64452 ANA	TG64452 Analog ADPCM Med Priority	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	Analog/ADPCM		TRUE
64453	10	998	64453 ANA	TG64453 Analog ADPCM Med Priority	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	Analog/ADPCM		TRUE

23.4 PSAPs

Region Id	Agency Id	PSAP Id	Device Id	Name	Description	Max Talk Paths	Service Type
10	998	9101	1	Console9101	Console9101	7	IP Console
10	998	9102	1	Console9102	Console9102	7	IP Console
10	998	7001	1	VTI7001	VTI7001	16	VTI
10	998	7002	1	VTI7002	VTI7002	16	VTI
10	998	9103	1	Console9103	Console9103	7	IP Console
10	998	9104	1	Console9104	Console9104	7	IP Console
10	998	9105	1	Console9105	Console9105	7	IP Console
10	998	9106	1	Console9106	Console9106	7	IP Console
10	998	9107	1	Console9107	Console9107	7	IP Console
10	998	9108	1	Console9108	Console9108	7	IP Console
10	998	9109	1	Console9109	Console9109	7	IP Console
10	998	9110	1	Console9110	Console9110	7	IP Console

Region Id	Agency Id	P25 IP Address	OpenSky IP Address	Description	Electronic Serial Number	Protocol Mask	Status	Sub Type	Assigned End User	Algorithm Support
10	998		10.128.111.19	OS_Radio_19	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.20	OS_Radio_20	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.2	OS_Radio_02	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.3	OS_Radio_03	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.4	OS_Radio_04	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.5	OS_Radio_05	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.6	OS_Radio_06	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.7	OS_Radio_07	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.8	OS_Radio_08	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.9	OS_Radio_09	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.10	OS_Radio_10	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.11	OS_Radio_11	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.12	OS_Radio_12	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.13	OS_Radio_13	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.14	OS_Radio_14	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.15	OS_Radio_15	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.16	OS_Radio_16	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.1	OS_Radio_1	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.17	OS_Radio_17	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.18	OS_Radio_18	0000000000000000	OpenSky	Enabled Unit			
10	998	10.128.79.9		Radio9	0000000109980009	P25	Enabled Unit	Harris XG-75 Portable	010:998:0009	AES
10	998	10.128.79.10		Radio10	0000000109980010	P25	Enabled Unit	Harris XG-75 Portable	010:998:0010	AES
10	998	10.128.79.8		Radio8	0000000109980008	P25	Enabled Unit	Harris XG-75 Portable	010:998:0008	AES
10	998	10.128.53.1		Console9101	0000000109989101	P25	Enabled Unit	Maestro Console	010:998:9101	AES
10	998	10.128.53.2		Console 9102	0000000109989102	P25	Enabled Unit	Maestro Console	010:998:9102	Both

10	998	10.128.79.1	Radio1	0000000109980001	P25	Enabled Unit	Harris P5400	010:998:0001	AES
10	998	10.128.79.2	Radio2	0000000109980002	P25	Enabled Unit	Harris P5400	010:998:0002	AES
10	998	10.128.79.3	Radio3	0000000109980003	P25	Enabled Unit	Harris XG-75 Portable	010:998:0003	AES
10	998	10.128.79.4	Radio4	0000000109980004	P25	Enabled Unit	Harris XG-75 Portable	010:998:0004	AES
10	998	10.128.79.5	Radio5	0000000109980005	P25	Enabled Unit	Harris XG-75 Portable	010:998:0005	AES
10	998	10.128.79.6	Radio6	0000000109980006	P25	Enabled Unit	Harris XG-75 Portable	010:998:0006	AES
10	998	10.128.79.7	Radio7	0000000109980007	P25	Enabled Unit	Harris XG-75 Portable	010:998:0007	AES
10	998	10.128.79.11	Radio11	0000000109980011	P25	Enabled Unit	Harris UNITY XG-100P	010:998:0011	AES
10	998	10.128.79.12	Radio12	0000000109980012	P25	Enabled Unit	Harris UNITY XG-100P	010:998:0012	AES
10	998	10.128.1.161	s0u1xcda	0000000000000000	P25	Enabled Unit		010:998:9001	AES
10	998	10.128.1.162	s0u1xcdb	0000000000000000	P25	Enabled Unit		010:998:9005	AES

24. Action Items

Test #	Page #	Action/Issue	Date Resolved	Resolution

STAGING ACCEPTANCE TEST PROCEDURES

ABOUT THIS DOCUMENT

This document was specifically prepared for the customer shown below. Each section of this document is individually maintained in the Harris document control system.

Customer: Washoe County

Prepared By: Smitha Paramashivan

DOCUMENT USAGE

Many of the tests in this document will need to be run on multiple pieces of equipment. For tests that need to be run multiple times, log in the comment section of the result box the identifier of the equipment tested. Although specific tests are not included relating to electrical measurements or timing parameters of equipment, these tests and levels are conducted and recorded as part of Harris' standard production and/or installation practices. These parameters include but are not limited to:

- Transmit Frequency and Deviation
- Output and Reflected Power
- Receiver Sensitivity
- Receiver Multicoupler Gain (if applicable)
- Receiver Preamplifier Gain (if applicable)
- Combiner Loss (if applicable)
- Audio line out
- Audio line in

SUBSCRIBER UNIT USAGE

All tests for subscriber (terminal) units in this document will be performed with Harris subscriber units unless the test setup identifies another Vendor's subscriber unit to be used.

1. CUSTOMER APPROVAL

These Test Procedures have been read and approved for use as the Staging Acceptance Test.

Customer Representative	**Harris Corporation Representative**
Signature and Date	Signature and Date
Printed name and title	Printed name and title

2. SYSTEM ACCEPTANCE

This Acceptance Test Procedure has been fully and successfully completed with all action items resolved.

Customer Representative	**Harris Corporation Representative**
Signature	Signature
Printed name and title	Printed name and title
Date	Date

FUNCTIONAL TESTING CLARIFICATION

Equipment inspection and testing in addition to staging acceptance testing is performed at the Harris staging facility. Staging tests as detailed in this matrix verify basic equipment functionality in addition to its functionality as part of an overall system. Equipment as received from Harris and third-party manufacturing suppliers is supplied with manufacturer test results, as applicable. Test results documentation will be that from the staging acceptance tests. Equipment tests will be performed in the field after installation both as part of equipment commissioning and overall final functional acceptance testing. Test results documentation will be from the final functional acceptance tests.

3. VIDA UNIVERSAL ADMINISTRATION SERVER (UAS)

3.1 Create an Agency Level Administrator Account in the UAS

Purpose: **Demonstrate the capability to create Agency Admin Accounts in the UAS.**

Expected Results: **This test will create a new Agency Level Administrator account.**

Setup: **Need system level access to an UAS or UAS Client. Predefined Agency and Region in the UAS.**

Execution:

1. Browse to the UAS at the address of 'https://s0u1uas.vida.local:8443/nas'
2. Log in with UAS administrator level account.
   - Verify that default accounts are created (see list below) and verify a default Agency administrative class, by selecting System/Administration/Admin User.
3. Select "Add" to display the Administration User Detail screen.
4. Enter a name (e.g., TestAgency), description, and password. Select save to download and click 'OK'.
5. Log out of the default account.
6. Log in with the newTestAgencyAdmin. Verify access to account.
   - Verify access to account.
7. Log out of the Test AgencyAdmin.
8. Log in with the default account and delete the TestAgencyAdmin.

Admin User	Admin Class	Description
agency998	Agency998	Agency 998 Access
Vida	RSA	RSA
ProvTool	RSA	Provtool
vida2	RSA	vida2
Hp	RSA	Hao for Testing
Provtool2	RSA	Provtool
Provtool3	RSA	Provtool
Provtool4	RSA	Provtool
Kc	RSA	Kc

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

3.2 Provision Agency with Talk Groups and Subscriber Units in the UAS

Purpose: **Demonstrate the capability to add talk-groups and users to the Agency accounts in the UAS.**

Expected Results: **This test will show that a user can add a new talk group and users to the system.**

Setup: **System/Region/Agency level access to the UAS or a UAS client.**

Talk Groups				
Name	Description	SPNI	Property Id	Priority Id
64000ALL	TG64000 P25	Full Rate All Call	1	3
64100ALL	TG64100 P25	Full Rate All Call	1	3
64101TCL	TG64101 P25	Full Rate Conf Med Priority	1	4
64102TCM	TG64102 P25	Full Rate Conf Med Priority	1	4
64103TCM	TG64103 P25	Full Rate Conf Med Priority	1	4
64104TCM	TG64104 P25	Full Rate Conf Med Priority	1	4
64105TCM	TG64105 P25	Full Rate Conf Med Priority	1	4
64106TCH	TG64106 P25	P25 Full Rate Conf High Priority	1	4

Radios						
Description	RSI	Protocol Mask	Status	Sub Type	Assigned End User	Algorithm Support
Radio1	9980001	P25	Enabled Unit	Harris P5400	010:998:0001	AES
Radio2	9980002	P25	Enabled Unit	Harris P5400	010:998:0002	AES
Radio3	9980003	P25	Enabled Unit	Harris XG-75 Portable	010:998:0003	AES
Radio4	9980004	P25	Enabled Unit	Harris XG-75 Portable	010:998:0004	AES
Console9101	9989101	P25	Enabled Unit	Maestro Console	010:998:9101	AES

Radio5	9980005	P25	Enabled Unit	Harris XG-75 Portable	010:998:0005	AES
Radio6	9980006	P25	Enabled Unit	Harris XG-75 Portable	010:998:0006	AES
Radio7	9980007	P25	Enabled Unit	Harris XG-75 Portable	010:998:0007	AES
Radio8	9980008	P25	Enabled Unit	Harris XG-75 Portable	010:998:0008	AES
Radio9	9980009	P25	Enabled Unit	Harris XG-75 Portable	010:998:0009	AES
Radio10	9980010	P25	Enabled Unit	Harris XG-75 Portable	010:998:0010	AES

Execution:

1. Log into the UAS with one of the default accounts.

2. Under Agency 998, create a talk group by select ‘R/W Talk Group’, select Agency/ “agency name”/ R/W Talk Group.

3. Click ‘Add’ and then on the Talkgroup Detail screen input the TG ID in the table below. All setting not listed use auto setting for setting not listed. Click OK and download.

   - Verify the talk group has been added to the list of Talkgroups

4. Using Putty on an SMT, log into a traffic controller at each control point for simulcast and each site for multisite and issue the command ‘show gdb’

   - Verify that group 64454 exits in the traffic controller user data base.

5. Once the group has been verified, delete it from the UAS.

TG Id	Name	Description	SPNI	Property Id
64454	64454ANA	Half Rate Low Priority	1	3

Priority Id	Coverage	Valid Coverage
5	P25Sites_PSAPs	P25Sites_PSAPs

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

3.3 Dynamic Regroup from the UAS

Purpose: **Demonstrate the ability to dynamically regroup Subscriber units from the UAS.**

Expected Results: **This test will combine selected talk groups into a single interop group.**

Setup: **Radios must have "Allow P25T Unsolicited Dynamic Regroup" checked in the radio personality under General Options.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	9980001	TG64051 P25	64001
Radio 2	9980002	TG64052 P25	64002
Radio 3	9980003	TG64053 P25	64003

Execution:

1. At the UAS, select 'Regroup' tab and 'Regroup Profile'.

2. Click 'Add' to add profile detail; name Group 'Regroup1', and Description 'Regroup1 Test'.
   - Define regroup profile; select Agency 998 and 'Talk Group 3'.
   - Select 'OK', and save changes to the UAS.

3. Click 'End User Group' and click 'Add'. Name Group 'Regroup1' and Description 'Regroup1 test'.
   - Select Agency 998 from 'Select a Scope' drop down box.
   - Add 'Radio 1' and 'Radio 2' to the 'Selected' windows.
   - Select 'OK' to close 'End User Group Detail'.
   - Click 'Save' button to Download the new regroup.

4. Click 'Define Regroup' and click 'Add' to name the Regroup 'Regroup1' and Description 'Regroup1 test'.
   - Change 'Profile Name' to 'Regroup1' and change 'End User Group Id' to 'Regroup1'.
   - Click 'OK' and save to click 'Save' the changes to the UAS.

5. Click 'Manage Regroup' check the box for 'Regroup1' and select the button for 'Regroup'.
   - Click 'Save' to start Regroup.
   - Verify that Radio 1 and Radio 2 are forced to 'Talk Group 3'.

6. At 'Radio 1' and 'Radio 2', attempt to change talk groups away from 'Talk Group 3'
   - Verify that both radios are forced to remain on 'Talk Group 3'.

7. PTT 'Radio 1' on 'Talk Group 3'.
   - Verify that 'Radio 3' hears audio on 'Talk Group 3' and can respond.

8. Clear the dynamic regroup from the UAS client.
   - ☐ Verify ‘Radio 1’ and ‘Radio 2’ are no longer forced to ‘Talk Group 3’ (i.e., they can select other predefined Talk-Groups).

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

3.4 Unit Deregistration

Purpose: **Demonstrate that radio will automatically deregister when the radio is turned off.**

Expected Results: **This test will show that radio that is off will not create traffic load demand.**

Setup: **Radio 1 is only radio on 'Talk Group A' for this test.**
All other radios should be on different talk groups.

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	9980001	TG64001 P25	64001
Console	9989101	TG64001 P25	64001

Execution:

1. On a client computer, open the windows internet explorer and browse to https://s0u1rnm.vida.local/nmc. Choose System Map and select 'Launch Application' button. Open Realtime tab and Click Mobiles.
   - ☐ Verify 'Radio 1' LID is shown registered on the site.

2. PTT 'Console' on TG 64001 and verify it communicates on the system to 'Radio 1'.
   - ☐ Return call from 'Radio 1' to 'Console' on TG 64001.

3. Turn off 'Radio 1' and wait for expiration of the radio timeout period.

4. Refresh RNM Mobiles screen periodically and verify Radio 1 deregistered after VNIC Remove Demand Timer has passed.

5. PTT 'Console' on TG 64001, after the expiration of the timeout.
   - ☐ Verify no channel is assigned to site, since no demand exists at the sites.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

3.5 UAS Site Adjacency Configuration

Purpose: **Demonstrate the capability to configure site adjacencies in the UAS.**

Expected Results: **Site adjacencies will be successfully configured and modified.**

Setup: **UAS installed and functioning on System network.**

Execution: Basic test is to follow the manual and SRN instructions to configure site adjacencies using the new graphical interface.

1. In the UAS go to System > System Properties > Site adjacency.
2. Select a site on the left side to configure for adjacency information.
3. Use the left-hand side to add adjacencies for the site.
   - ☐ Confirm the adjacent sites are removed from the non-adjacent site list and display correctly on the right side.
4. Use the right-hand side to remove a site adjacency.
   - ☐ Confirm the removed adjacency disappears on the right side and is displayed as a non-adjacent site on the left side.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

3.6 Unit Enable/Disable from the UAS

Purpose: **Demonstrate the ability to disable a lost/stolen radio from the UAS.**

Expected Results: **This test will disable & re-enable a designated radio.**

Setup: **Obtain 2 radios switched to the same group and note the IDs. Switch on the radios and ensure that they communicate. Verify all sites are connected to the NSC, and that all sites are online.**

[Note: If a radio is encrypted, Unit Disable will automatically delete the encryption key from the radio, as it is disabled. To restore unit functionality for an encrypted radio, the radio must have the encryption key re-installed**.]**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64001 P25	64001
Radio 4	998005	TG64001 P25	64001

Execution:

1. In the UAS Select TG 64001 on Radios 1, 2, and 4.
   - Verify that the radios can communicate.

2. From the UAS:
   - Click Radio 4 ENABLE/DISABLE.
   - Under the UNIT Enable/Disable tab, enter the ID of radio 4 to be modified.
   - Select the DISABLE button and check the status.
   - Attempt to PTT Radio 4 and verify that it will not communicate with the other encrypted radios
   - PTT Radio 1 and verify that Radio 4 cannot receive the call.

3. Enable the ID of Radio 4.
   - Verify that the Enable/Disable screen indicates that the Current State of the radio is Enabled.
   - Confirm that the radios can communicate in unencrypted mode.

4. Switch off Radio 4 and disable it from the Enable/Disable screen.
   - Switch on the radio and verify that, on logging into the site, it becomes disabled.
   - Verify that the State settings change to Disabled and that the radios cannot communicate.

5. Enable Radio 4.
   - Verify that radios can communicate in unencrypted mode.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

4. OVER THE AIR REKEYING (OTAR)

4.1 Generating a system UKEK

Purpose: **This test is setup to verify the KMFs ability to create a UKEK.**

Expected Results: **The KMF will create a UKEK.**

Setup: **This test requires a computer that is on the IP network and has 'Harris Key Manager' installed and running.**

1. Log into the KMF with the administrator level Active Directory Account
2. Open the 'Network KMF Management'
3. Select the UKEK tab
4. Change the 'Save As' text field to '\\fileshare\fileshare\kmf_files\ProvisionFile.ukek'
5. Generate the UKEK file by selecting the 'Export UKEK' button
6. Select the 'SLN Bindings' tab
7. Change the 'Save As' text field to '\\fileshare\fileshare\kmf_files\SlnBindingsReport/xml'
8. Generate the bindings by selecting 'Generate SLN Bindings Report'. This file will be used in a later test.

(Pass/Fail) _____ Tester: _____

Date: _____ Comments: _____

4.2 UKEK a Radio

Purpose: **This test is setup to verify the KMFs ability to load UKEKs into a radio.**

Expected Results: **The radio should accept the UKEK file developed by the KMF.**

Setup: **This test requires a computer that is on the IP network and has 'Harris Key Manager' installed and running. This test also requires three radios programmed with a talk group utilizing an AES encryption key. All radios should be feature encrypted and enabled for OTAR operation. Two radios should have keys and one radio should not have keys. In test "Unit Enable/Disable from the UAS" they keys were removed from radio 9980005.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64001 P25	64001
Radio 5	998005	TG64001 P25	64001

Execution:

1. On a computer with 'Harris Key Manager' installed, save the file at '\\fileshare\fileshare\kmf_files\ProvisionFile.ukek' to the local computer.
2. Start 'Harris Key Manager' and connect the radio to the local computer.
3. Select 'Tools' -> 'Key Load Wizard' to open key load wizard
4. Select 'Next' -> Load a UKEK file into one or more devices" and open the UKEK file in step 1 and select 'Next'
5. Once the UKEKs are loaded select 'Next'
6. Choose the com port
7. Power on the radio and put the radio into Key Load Mode
8. Select 'Load' to load UKEK into the radio

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

4.3 Warm starting a radio from the UAS Key Management Application

Purpose: **This will test the system's ability to push encryption keys to a radio and the radio to hear other radios on the encrypted talk group.**

Expected Results: **The radio will accept the keys from the system and be able to communicate with other encrypted radios on an encrypted talk group.**

Setup: **This test requires three radios programmed with a talkgroup utilizing an AES encryption key. The radios and talkgroup need to be in a test crypto net in the UAS Key Management Application. The radios should be both feature encrypted and enabled for OTAR operation. Two radios should have working encryption, and Radio 4 should have the ukek load but no keys.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64001 P25	64001
Radio 5	998005	TG64001 P25	64001

Execution

1. PTT all three radios
   - Radios 1 and 2 should communicate normally
   - Radio 1 and 2 should hear calls from radio 5 but radio 5 should not be able to hear calls from the encrypted radios

2. From the UAS, warm start radios 5.
   - The UAS will report "Warm Starting".

3. After the operation is complete, refresh the UAS screen.
   - Verify the UAS reports "Warm Started Success" for radios 5

4. Again, PTT radio 1 on the encrypted talk group and talk.
   - Radio 1's transmit (TX) indicator should turn on and be amber.
   - Verify that radio 1 and 2 now decrypt the call's audio.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

4.4 Rekeying and Changing Over a Crypto Net from the UAS

Purpose: **This test will show that the system can change the encryption keys to a new set of keys.**

Expected Results: **After this test is complete the radio will be able to communicate with the new set of keys sent by the system**

Setup: **This test requires three radios programmed with a talk group utilizing an AES encryption key. The radios and talk group need to be in a test crypto net in the UAS Key Management Application. All radios should be feature encrypted and enabled for OTAR operation. The radios should have been warm started previously. If a console and/or GWB are present in the system, then these devices should be included in this test also. They need to be in the same test crypto net as the radios and be programmed with the test talk group. They should have been warm started previously.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64001 P25	64001
Radio 5	998005	TG64001 P25	64001

Execution:

1. Put radios 1, 2 and 5 on the encrypted talk group.
   - Verify that all 3 radios can transmit and receive on the encrypted talk group.
2. Leave radios 1 and 2 powered on and power off Radio 5.
3. From the UAS, rekey the crypto net. The UAS will report “Rekeying” for the crypto net.
4. Select the report icon for the crypto net.
   - Radios 1 and 2 should be shown as “Rekeyed.”
   - Any consoles and/or GWB’s should also be shown as “Rekeyed.”
   - Radio 5 should be shown as “Rekey Failed.”
5. From the UAS, change over the crypto net. It should report “Changing Over” for the crypto net.

6. After the operation is complete, refresh the UAS screen. It should report “Changing Over Complete” for the crypto net

7. Turn on Radio 3. PTT radio 1 on the encrypted talk group and talk. The transmit (TX) indicator should turn on and be amber at radio 1.

   - ☐ Verify that radio 2 but not 3 decrypt the call’s audio.
   - ☐ Verify that any consoles and/or GWB’s decrypt the call’s audio also.

8. PTT Radio 3 on the encrypted talk group and talk.

   - ☐ The transmit (TX) indicator should turn on and be amber at Radio 3.
   - ☐ Verify that radios 1 and 2 decrypt the call’s audio.
   - ☐ Verify that any consoles and/or GWB’s decrypt the call’s audio.

9. From the UAS, do an end user level rekey on Radio 3 for that crypto net.

   - ☐ The UAS will report “Rekeying” for Radio 3.

10. After the operation is complete, refresh the UAS screen. It should now show “Rekeyed” for Radio 3.

    - ☐ Select the report icon for the crypto net. Radios 1, 2, and 3 will be shown as “Rekeyed.”
    - ☐ From the UAS, do an end user change over on Radio 3 for the test crypto net. The UAS will report “Changing Over” for Radio 3.

11. Again, PTT radio 1 on the encrypted talk group and talk.

    - ☐ Verify that Radio 1’s transmit (TX) indicator turns amber.
    - ☐ Verify that radio 2 and 3 decrypt the call’s audio.
    - ☐ Verify that any consoles and/or GWB’s decrypt the call’s audio also.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

4.5 Zeroizing a Radio from the UAS Key Management Application

Purpose: **This test will verify the system's ability to delete the keys out of a radio that was encrypted.**

Expected Results: **The test will take a radio that has keys and can communicate with other encrypted radios and remove the keys, so the radio cannot communicate with other encrypted radios.**

Setup: **This test requires three radios programmed with a talk group utilizing an AES encryption key. The radios and talk group need to be in a test crypto net in the UAS Key Management Application. All radios should be feature encrypted and enabled for OTAR operation. The radios should have been warm started previously.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64001 P25	64001
Radio 5	998005	TG64001 P25	64001

Execution:

1. Put radios 1, 2 and 3 on the encrypted talk group.
   - Verify that all 3 radios can transmit and receive on the encrypted talk group.
2. From the UAS, zeroize Radio 3.
   - The UAS will report "Zeroizing" for Radio 3 with the date and time updating to reflect the date and time the operation was initiated.
   - After the operation is complete, refresh the UAS screen. Verify the UAS reports "Zeroized" for Radio 3.
3. PTT radio 1 on the encrypted talk group and talk.
   - The transmit (TX) indicator should turn on and be amber at radio 1.
   - Verify that radio 2 decrypts the call's audio.
   - Radio 3 should hear garbled audio or muted audio.
   - Verify the receive indicator is amber on both radios and the ID of radio 1 should be seen at both radios 2 and 3.
   - Verify Radio 3 shows "No Key 0" when it is PTT'ed on the encrypted talk group.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

4.6 Rekey A Radio from the Radio

Purpose: **This test will test the system's ability to send keys to a radio when the radio requests the keys.**

Expected Results: **The test will take a radio that has keys and can't communicate with other encrypted radios and add keys to the radio, so it can communicate with the system.**

Setup: **This test requires three radios programmed with a talk group utilizing an AES encryption key. The radios and talk group need to be in a test crypto net in the UAS Key Management Application. All radios should be feature encrypted and enabled for OTAR operation. One of the radios should be the radio that was zeroized in the previous test.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64001 P25	64001
Radio 5	998005	TG64001 P25	64001

Execution:

1. Key Radio 1 on an encrypted talk group.

   - Radio 1 should display 'No key' Radio 2, and 3 should not hear the call.

2. From the menu on Radio 1 select 'Rekey' to request new key for Radio 1.

   - Once the radio receives the encryption keys, key Radio 1 and verify Radio 2, and 3 hear the call.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

4.7 UKEK and Symphony

Purpose: **This test is setup to test the KMFs ability to make UKEK files the Symphony can use.**

Expected Results: **The Symphony should accept the UKEK file developed by the KMF.**

Setup: **This test requires three radios programmed with a talk group utilizing an AES encryption key. All radios should be feature encrypted and enabled for OTAR operation.**

Execution:

1. Start the Symphony Application
2. With an encrypted radio make a call on an encrypted talkgroup,
   - the radio with encryption should play the call,
   - the console will not because it does not have keys.
3. Start the 'Manual Key Loader' application.
4. Select 'Load UKEK'
5. Select the 'Browse' button
6. Browse to '//fileshare/fileshare/KMF_Files/ProvisionFile.ukek'
7. Select the 'Load' button
8. Close the application by hitting the 'Done' button.
9. Select 'Maestro Conductor Application' from the lower right-hand side to the console desktop.
10. Select 'Load Encryption' this will bring up a window were the binding and UKEK can be loaded into the console
11. Select the button next to the 'UKEK' text field and select the UKEK saved in step 9.
12. Select the button next to the 'binding' text field and select the binding saved in step 9.
13. Close the 'Load Encryption' pop up.

14. With an encrypted radio make a call on an encrypted talkgroup

    - the radio with encryption should play the call,
    - the console will now play the call.

15. Choose the talkgroup that the radios are on and select the 'Private' button, this will make the console switch the talkgroup to encrypted mode, the console will display 'PVT' on the talkgroup button.

16. PTT the console the call should be heard on the encrypted radios.

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

4.8 Warm Starting a Symphony from the UAS Key Management Application

Purpose: **This will test the system's ability to push encryption keys to a console.**

Expected Results: **The UAS will push keys to the console to allow for communicate on an encrypted talk group.**

Setup: **This test requires three radios programmed with a talkgroup utilizing an AES encryption key. The radios and talkgroup need to be in a test crypto net in the UAS Key Management Application. All radios should be feature encrypted and enabled for OTAR operation. The radios should have their UKEK's loaded but not have any traffic encryption keys. (Delete Keys if required)**

Execution:

1. Attempt to switch a talk group to encrypted mode by selecting the talk group and selecting the private button.

   - ☐ Verify that console will not allow you to encrypt the talkgroup because the console does not have the encryption keys.

2. From the UAS, warm start the console. After the operation is complete, refresh the UAS screen.

   - ☐ The UAS will report warm started success the console.

3. Attempt to switch a talk group to encrypted mode by selecting the talk group and selecting the private button.
   - ☐ The console will now allow you to encrypt the talkgroup because the console has the encryption keys.

4. PTT the console and the encrypted radios should hear the call.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

5. ENCRYPTED VOICE

5.1 Single Site Encrypted Group Test Call

Purpose: **The Group Test Call will show that the site will allow a radio to communicate using a group call**

Expected Results: **The test will demonstrate that all radios assigned to a common group will hear a call and all radios assigned to an uncommon group will not hear the call**

Setup: **Set Radios 1, 2, and 3 to (Group A) per test group structure. Make sure Scan is turned OFF. All radios should not be in encrypted mode but have encryption keys.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64001 P25	64001
Radio 3	998003	TG64001 P25	64001

Execution:

1. PTT Radio 1 and talk.
   - The transmit (TX) indicators should turn on at Radio 1.
   - Audio should be heard in Radios 2 and 3.
   - The ID of Radio 1 should be seen on Radios 2 and 3.

2. Set Radio 3 to (TG64002 P25). PTT on Radio 1 and talk.

3. The transmit (TX) indicators should turn on at Radio 1.
   - Audio should be heard in Radio 2 only.
   - The ID of Radio 1 should be seen at Radio 2 only.

4. Repeat sets 1-3 for encrypted mode

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

5.2 Single Site Encrypted Individual (Private) Call

Purpose: **The Individual Call test will verify that the site will allow two radios to communicate on a private call**

Expected Results: **This test will demonstrate that two radios can communicate on an individual call and other radios will not hear the private conversation.**

Setup: **Set Radios 1, 2, and 3 to (TG64001) per test group structure. All radios should not be in encrypted mode but have encryption keys.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64001 P25	64001
Radio 3	998003	TG64001 P25	64001

Execution:

1. Using the Radio 1, select the pre-stored ID of Radio 2 or enter the Radio 2 ID directly from the keypad, and PTT Radio 1.
   - Verify that Radio 2 receives the call and displays the ID of Radio 1. Verify that Radio 3 remains idle.

2. Release the PTT on Radio 1 and immediately PTT on Radio 2.
   - Verify that Radio 1 receives the call and displays the ID of Radio 2.
   - Verify Radio 3 remains idle.

3. Using the Radio 1, select the pre-stored ID of Radio 3 or enter the Radio 3 ID directly from the keypad, and PTT Radio 1.
   - Verify that Radio 3 receives the call and displays the ID of Radio 1.
   - Verify that Radio 2 remains idle.

4. Release the PTT on Radio 1 but do not immediately PTT Radio 3.
   - Verify that Radio 3 gives a Call Back Alert (WHC- “Who Has Called”) Indication.

5. Make a return call from Radio 3 back to Radio 1.
   - Verify that Radio 1 receives the call and displays the ID of Radio 3.
   - Verify Radio 2 remains idle.

6. Repeat steps 1-5 for encrypted mode.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

5.3 Multi-Site Encrypted Group Test Call

Purpose: **The Group Test Call will show that the site will allow a radio to communicate using a group call**

Expected Results: **The test will demonstrate that all radios assigned to a common group will hear a call and all radios assigned to an uncommon group will not hear the call**

Setup: **Set Radios 1, 2, and 3 to (Group A) per test group structure. Make sure Scan is turned OFF. All radios should not be in encrypted mode but have encryption keys.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64001 P25	64001
Radio 3	998003	TG64001 P25	64001

Execution:

1. PTT Radio 1 and talk.
   - ☐ The transmit (TX) indicators should turn on at Radio 1.
   - ☐ Audio should be heard in Radios 2 and 3.
   - ☐ The ID of Radio 1 should be seen on Radios 2 and 3.
2. Set Radio 3 to (TG64002 P25), PTT on Radio 1 and talk.
   - ☐ The transmit (TX) indicators should turn on at Radio 1.
   - ☐ Audio should be heard in Radio 2 only.
   - ☐ The ID of Radio 1 should be seen at Radio 2 only.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

5.4 Multi-site Encrypted Individual (Private) Call

Purpose: **The Individual Call test will verify that the site will allow two radios to communicate on a private call**

Expected Results: **This test will demonstrate that two radios can communicate on an individual call and other radios will not hear the private conversation.**

Setup: **Set Radios 1, 2, and 3 to (TG64001) per test group structure. All radios should not be in encrypted mode but have encryption keys.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64001 P25	64001
Radio 3	998003	TG64001 P25	64001

Execution:

1. Using the Radio 1, select the pre-stored ID of Radio 2 or enter the Radio 2 ID directly from the keypad, and PTT Radio 1.
   - ☐ Verify that Radio 2 receives the call and displays the ID of Radio 1.
   - ☐ Verify that Radio 3 remains idle.

2. Release the PTT on Radio 1 and immediately PTT on Radio 2.
   - ☐ Verify that Radio 1 receives the call and displays the ID of Radio 2.
   - ☐ Verify Radio 3 remains idle.

3. Using the Radio 1, select the pre-stored ID of Radio 3 or enter the Radio 3 ID directly from the keypad, and PTT Radio 1.
   - ☐ Verify that Radio 3 receives the call and displays the ID of Radio 1.
   - ☐ Verify that Radio 6 remains idle.

4. Release the PTT on Radio 1 but do not immediately PTT Radio 3.
   - ☐ Verify that Radio 3 gives a Call Back Alert (WHC- “Who Has Called”) Indication.
   - ☐ Then make the return call from Radio 3 back to Radio 1.
   - ☐ Verify that Radio 1 receives the call and displays the ID of Radio 3.
   - ☐ Verify Radio 2 remains idle.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

5.5 Phase 2 AES

Purpose: **Confirms the operation of AES encryption for phase 2 voice calls.**

Expected Results: **The encrypted talk groups can communicate.**

Setup **Console 1 programmed with a AES encrypted phase 2 talk group and two radios programmed with the same AES Talk group and key, one radio with the group but no key and one radio with the AES group with a different key.**

Execution:

1. Place a call from one of the radios with the correct key on the AES group
   - ☐ Confirm that the call is heard on the other radio and the console
   - ☐ Confirm the call is not heard on the two radios that do not have the correct key.
2. Place a call on the AES group from the console
   - ☐ Confirm that the call is heard on the two radios with the correct key
   - ☐ Confirm the call is not heard on the two radios that do not have the correct key.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

6. ENCRYPTED DATA

6.1 Encrypted data on an unencrypted radio

Purpose: **Confirm that when the system is setup for encrypted data, the data communication leaves the system encrypted and cannot be read by a radio that does not have the encryption key.**

Expected Results: **The radio can't be pinged, and the radio personality can't be read/programmed.**

Setup: **This test requires: section 'Unit Enable/Disable from the UAS' has been performed, radio 9880005 is enabled but not encrypted, needs to run from edata terminal, edata setup not set to best effort.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	9980001	TG64001 P25	64001
Radio 2	9980002	TG64001 P25	64001
Radio 5	9980005	TG64001 P25	64001

Execution:

1. From the edata terminal.
   - ☐ Verify that a host can't ping the radio.
   - ☐ Verify the radio personality can't be read.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

6.2 Unencrypted data With Encrypted Radio

Purpose: **Confirm when a radio does have the encryption key it can communicate with the Encrypted Data Terminal.**

Expected Results: **The radio can be pinged, and the radio personality can be read/programmed.**

Setup: **This test requires: Radio 9880004 is enabled and encrypted, needs to run from edata terminal, edata setup not set to best effort.**

Radio 4 needs to be part of the "eData CryptoNet", and also have "keys" loaded.

Description	Radio LID	TG Description	TG ID
Radio 4	9980004	TG 64001 P25	64001

Execution:

1. From the edata terminal.
   - ☐ Verify that a host can ping the Radio 4.
   - ☐ Verify the radio personality can be read.

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

7. IN-CALL STATUS REPORTING

7.1 In-Call Location Reporting Radio

Purpose: **This test will demonstrate system ability to send location status from a radio.**

Expected Results: **The system will display the radio location, and the location will change when the radio moves.**

Setup: **The system needs to be setup using the 'In-Call Status Reporting Manual' and the CLTsim need to be set up using Appendix A. This test will not work unless the radio has GPS lock, so this test may not work indoors.**

Execution:

1. Log into CLTsim and open two terminal windows
   a. In terminal windows 1 type './cltsim –ccltsim.cfg' do not close the window
   b. In terminal windows 2 type 'cltcmd -1 10.128.1.209 –u 21225 –s –j ipv4.10.128.79.1@vida.local –n location –n userStatus

2. PTT radio 1 for at least 3 seconds

3. Terminal widow 1 will show the output of the GPS data.

   ☐ Check to make sure GPS data is displayed.

4. Move radio 1 about 50 feet and PTT again for 3 seconds

   ☐ Verify GPS Data changes.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

7.2 In-Call Status Reporting Radio

Purpose: **This test will demonstrate system ability to send status from a radio.**

Expected Results: **The system will display the status from a radio.**

Setup: **The system needs to be setup using the 'In-Call Status Reporting Manual' and the CLTsim need to be set up using Appendix A.**

Execution:

1. Use terminal windows from pervious test
   a. In terminal windows 2 type
      'cltcmd -1 10.128.1.209 –u 21225 –s –j vuid.99999.10.998.6401@harris.com –n groupAlert –n userStatus

2. PTT radio 1 for at least 3 seconds

3. Terminal widow 1 will show the status of radio 1.

   ☐ Check to make sure radio 1 status is 'Open'.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

7.3 In-Call Emergency Reporting Radio

Purpose: **This test will demonstrate system ability to send location status from a radio.**

Expected Results: **The system will display the radio emergencies.**

Setup: **The system needs to be setup using the 'In-Call Status Reporting Manual' and the CLTsim need to be set up using Appendix A.**

Execution:

1. Use terminal windows from pervious test
   a. In terminal windows 2 type
   'cltcmd -1 10.128.1.209 –u 21225 –s –j vuid.99999.10.998.6401@harris.com –n groupAlert –n userStatus

2. Create emergency on Radio1.

   - ☐ Check to make sure Emergency is displayed as '1'.

3. Clear emergency on Radio 1
   - ☐ Check to make sure Emergency is changed to '0'

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

7.4 In-Call Location Reporting Be-On

Purpose: **This test will demonstrate system ability to send location status from a BeOn terminal.**

Expected Results: **The system will display the radio location, and the location will change when the radio moves.**

Setup: **The system needs to be setup using the 'In-Call Status Reporting Manual' and the CLTsim need to be set up using Appendix A. This test will not work unless the radio has GPS lock, so this test may not work indoors.**

Execution:

1. Log into CLTsim and open two terminal windows
   a. In terminal windows 1 type './cltsim –ccltsim.cfg' do not close the window
   b. In terminal windows 2 type
   'cltcmd -1 10.128.1.209 –u 21225 –s –j ipv4.10.128.79.1@vida.local –n location –n userStatus

2. PTT radio 1 for at least 3 seconds

3. Terminal widow 1 will show the output of the GPS data.

   ☐ Check to make sure GPS data is displayed.

4. Move radio 1 about 50 feet and PTT again for 3 seconds

   ☐ Verify GPS Data changes.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

7.5 In-Call Status Reporting Be-On

Purpose: **This test will demonstrate system ability to send status from a radio.**

Expected Results: **The system will display the status from a radio.**

Setup: **The system needs to be setup using the 'In-Call Status Reporting Manual' and the CLTsim need to be set up using Appendix A.**

Execution:

1. Use terminal windows from pervious test
    a. In terminal windows 2 type
    'cltcmd -1 10.128.1.209 –u 21225 –s –j vuid.99999.10.998.6401@harris.com –n groupAlert –n userStatus

2. PTT radio 1 for at least 3 seconds

3. Terminal widow 1 will show the status of radio 1.

    ☐ Check to make sure radio 1 status is 'Open'.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

7.6 In-Call Emergency Reporting Be-On

Purpose: **This test will demonstrate system ability to send location status from a radio.**

Expected Results: **The system will display the radio emergencies.**

Setup: **The system needs to be setup using the 'In-Call Status Reporting Manual' and the CLTsim need to be set up using Appendix A.**

Execution:

1. Use terminal windows from pervious test
   a. In terminal windows 2 type
   'cltcmd -1 10.128.1.209 –u 21225 –s –j vuid.99999.10.998.6401@harris.com –n groupAlert –n userStatus

2. Create emergency on Radio1.

   - ☐ Check to make sure Emergency is displayed as '1'.

3. Clear emergency on Radio 1

   - ☐ Check to make sure Emergency is changed to '0'

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

8. HIGH AVAIBILITY

8.1 Wide Area Router Failure

Purpose: **Demonstrate the capabilities of the system to work after a WAR failure**

Expected Results: **System components that are set-up with High Availability will continue to work after a WAR failure.**

Setup: **These tests are setup to be run twice, once on each router. So, after completing step 4 restart the WAR router if not already running wait 20 minutes and rerun the tests for the second router. These tests will simulate a WAR failure by disconnecting it from the Wide Area Network, so the WAR to WAN connection will need to be known.**

1. Use Radio 1 to initiate a call

   - Verify that the call is heard on the Radio 2. Keep the call active during fail-over.

2. Use Radio 3 to initiate a call

   - Verify that the call is heard on Radio 4. Keep the call active during fail-over.

3. Log in to s0u1nss and s0u2nss and change your user to the root user by typing ‘su –‘ and entering the password.

4. Type ‘HArunning’ into both NSSs, one will report that it is the ‘Stand By’ and one will report that it is the ‘Primary’ log the information in the chart below.

	Name of Primary NSS	Name of Primary WAR	Name of Primary RNM	Name of Primary RSM	Shutdown Time
Test 1					
Test 2					

5. Log into the ‘Primary’ WAR that is associated with the ‘Primary’ NSS. Shut off the connection to the WAN by performing a shut on the necessary ports.

   - The call from Radio 3 to Radio 4 will be dropped.

- ☐ The call from radio 1 to 2 will continue and the console will lose connectivity to the VNIC.
- ☐ Verify that after a short delay, the Backup server NSS2 automatically takes over as the primary server.

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

8.2 UAS Site Access Control for Invalid User ID

Purpose: **This test will demonstrate access control for Subscriber units with invalid radio IDs and High Availability of the RSM.**

Expected Results: **This test will deny a radio with an invalid Subscriber ID access to the system. Once the radio is added to the system the primary RSM will download it to the sites and allow the radio access. When the primary RSM is turned off and the radio is deleted from the UAS the secondary RSM will delete the radio from the system. Once the radio is deleted from the system the radio will again be denied access.**

Setup: **Use the table below to set up the new radio in the UAS**

Voice End User								
User Id	**Name**	**Description**	**Personality**	**User Privilege**	**Enable P25 AES OTAR**	**Manually-Keyed**	**P25 Voice Auth**	**Preferred Vocoder**
010:998:9150	Rad9150	Radio9150	Pers1	998_10_supervisor	FALSE	FALSE	FALSE	P25 Full Rate
OS Voice Auth	**Transc Allowed Flag**							
FALSE	TRUE							

Subscriber Unit							
Description	**RSI**	**Electronic Serial Number**	**Protocol Mask**	**Status**	**Sub Type**	**Assigned End User**	**Algorithm Support**
Radio9150	99899150	109989150	P25	Enabled Unit	Harris P5400	010:998:9105	AES

Execution:

1. Logging into a site traffic controller and type ‘show udb 109989150’

   - Verify the radio is not present in the traffic controller database

2. Program Radio 9801 with an ID 9989150.

3. Attempt to PTT Radio 9150.

   - ☐ Verify access to the site is denied and audio is not heard on Radio 2.

   - ☐ Verify the system is still functional by PTT Radio 2 and verify the audio is heard on Radio 3.

4. Use the supplied table to enter radio 109989150 in to the UAS database.
   a. Select Agency/"agency name"/Voice End User. Click Add Entry and then on the End User Detail screen input the User ID, password ("p25user"), Name, Description, etc. of the user. Click OK and download.

      - ☐ Verify the user ID has been added to the list of users\

   b. Select Agency/"agency name"/Subscriber Unit and enter the appropriate User ID, IP Address, and ESN for the user created in step 7. Click OK and download.

5. Loin into a site traffic controller issue a "show udb 109989150

   - ☐ Verify the radio is now present in the traffic controller database

6. Key radio 9150

   - ☐ Verify access to the site is permitted and audio is heard on radio.

7. Restart radio 9150 and PTT the radio

   - ☐ Verify access to the site is permitted and audio is heard on radio 9012.

8. Delete 10998999150 from the UAS database

9. Key radio 9150 from UAS

   - ☐ Verify access to the site is not permitted and audio is not heard.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

8.3 Site Activity using the Activity Warehouse

Purpose: **Demonstrate the capability to create various Agency level system usage reports.**

Expected Results: **This test will create an Agency level user reports.**

Setup: **Ensure radio traffic has occurred across the network recently. If necessary or desired, place some calls with a known radio ID on multisite talk groups prior to running the test for reference during the test.**

Execution:

1. Log into the SMT PC as a System level administrator.

2. Open Internet Explorer and browse to 'https://*s0u1pro.vida.local/*reports' and log in with active directory credentials.

3. Select Activity Reports → Call Activity
   a. enter the time period for the report (example: 2-hour window before this test).

4. Enter additional report information required.

5. Click on "View Report"
   - Check to make sure that there is call activity. These reports can be up to 2 hours behind.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

9. VIDA REGIONAL NETWORK MANAGER (RNM)

9.1 RNM Real Time Call Activity

Purpose: **Demonstrate the capability to monitor real-time call activity from the RNM.**

Expected Results: **This test will show active call traffic on specific talk groups and SIDs.**

Setup: **Administrator access to the RNM.**

Execution:

1. On a client computer, open the windows Internet Explorer and browse to https://s0u1rnm.vida.local/nmc and log in with an Active Directory account.
2. Choose the system map and select the 'Launch Application' button.
3. Open the Realtime tab and Click Site Calls.
4. Select the site and expand.
5. Check the box next to the channels and select to add the channels to the target list. Select the 'ok' button to launch the application.
6. Place a group call from Radio 1 to Radio 2 on the site.
   - ☐ Verify that the event viewer displays the talkgroup ID and calling party ID.
   - ☐ Verify the state changes from Free to Talk.
   - ☐ Verify the TG Alias displays the Group Number.
7. Use Internet Explorer to browse to https://s0u2rnm.vida.local/nmc and repeat test steps 1-6 for the second RNM.

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

9.2 Regional Network Manger Test

Purpose: **Demonstrate the capability to monitor system alerts from the RNM.**

Expected Results: **This test will show system level equipment icons.**

Setup: **Administrator access to the RNM.**

Execution:

1. On a client computer, open the windows Internet Explorer and browse to https://s0u1rnm.vida.local/nmc and log in with the active directory account.

2. Choose the system map and select the 'Launch Application' button. Select the 'Network' tab and expand the tree in the left-hand panel until you can see a site in the right-hand panel.

   - Verify the Infrastructure is presented.

   - Select an object and right click to select properties to view information related to the object.

3. Substitute https://s0u2rnm.vida.local/nmc and repeat test steps 1-3 for the second RNM.

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

9.3 RF System Alarms Indications are reported to the RNM

Purpose: **Demonstrate the capability to monitor system faults & alarms at the RNM.**

Expected Results: **System level equipment will indicate faults & alarms at the RNM.**

Setup: **Access to the site under test and the regional RNM. The alarm will need to be generated by equipment being physically powered-down. Note the time of the alarm condition for later tests. Call up the RNM Domain screen and verify that all map icons are either green or blue. On the Fault Browser screen delete any prior alarms.**

Execution:

1. On a client computer, open the windows Internet Explorer and browse to https://s0u1rnm.vida.local/nmc and log in with an Active Directory account.

2. Choose the system map and select the 'Launch Application' button.

3. Select the 'Network' tab and expand the tree in the left-hand panel until you can see a site in the right-hand panel.

4. Generate an alarm on a device (see chart) by powering down or otherwise disabling the device.

   - Verify that the RNM indicates a site alarm for the affected device.

5. Turn the device back ON.

   - Verify that the device alarm clears and displays green.

6. Review alarm details by performing a Right Mouse Click on an Object. Select the desired menu option.

7. Repeat steps 1-4 for all equipment listed in the below chart.

8. Substitute https://s0u2rnm.vida.local/nmc and repeat test steps 1-5 for the second RNM.

Record the results below for each site. (Note: This form can be modified to reflect actual as-built alarms

Tester:		Results:	Date:	
Alarm #	Name	Pass/Fail	Remarks	
1	Traffic Controller			
2	Router			
3	Switch			
4	Network Sentry			
5	MME			

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

9.4 Network Sentry Site Alarm Indications are reported to the RNM

Purpose: **Demonstrate the capability to monitor site faults & alarms at the RNM.**

Expected Results: **Site level equipment will indicate faults & alarms at the RNM.**

Setup: **This test verifies that the Site & Shelter Alarms are connected to the new system and alarm names are programmed to show the alarm types and locations. Site specific digital alarm inputs connected to the alarm management system (NetGuardian or Network Sentry) alarm unit.**

Execution:

1. On a client computer, open the windows Internet Explorer and browse to https://s0u1rnm.vida.local/nmc and log in with the Active Directory account.

2. Choose the system map and select the 'Launch Application' button.

3. Select the 'Network' tab and expand the tree in the left-hand panel until you can see a site in the right-hand panel.

4. Select a physical site to test alarm inputs.

5. Create a condition that will either simulate an alarm (jumper alarm contacts) or the actual event to trigger each alarm

   - Verify that the alarm is detected and displayed in the RNM Network Viewer and is listed in the Fault Browser

6. Clear the alarm condition

   - Observe that the alarm indication has cleared in both the Network Viewer and the Fault Browser

7. Repeat for each alarm and for each site in the system

8. Record the results below for each site. (Note; This form can be modified to reflect actual as-built alarms).

Site #:			Site Name	
Tester:		Results:	Date:	
Alarm #	Name	Pass/Fail	Remarks	
1	Door			
2	Smoke Detector			
3	Heat Detector			
4	Building Low Temp			
5	Building High Temp			
6	Main Power Fail			
7	ATS Normal			
8	ATS Emergency			
9	Generator Low Oil			
10	Generator Over Temp			
11	Generator Over Crank			
12	ACH1 L.O.			
13	ACH2 L.O.			
14	Surge Arrestor 1			
15	Surge Arrestor 2			
16	Multicoupler Top			
17	Multicoupler Bottom			

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

10. SIMULCAST CONTROL POINT MOVEMENT

10.1 DCP Forced Control Point Movement

Purpose: **This test will demonstrate the DCP system can move the control point in response to user command.**

Expected Results: **This test will verify that the Control Point can be moved from the active site to an alternate Control Point Site. After the control point is switched to the alternate Control Point the system should operate normally.**

Setup: **The DCP system is operating with an active control point and at least two sites are enabled to be the control point.**

Execution:

1. Log into the RNM
2. In Network view identify the site which is the active control point.
3. Right click on the control point site icon and select 'Change Control Point to Best Site Available".
4. Verify system is still functioning (i.e. voice calls can be made – between radios and a radio and console and optionally data calls can be made (e.g. radios can be 'pinged').
5. Verify that the RNM indicates a different site as control point and the previous control point is now a TX site. (note – a CP only site displays "zzzz" when it is not the active control point.)
6. On the RNM right click on the previous control point site and select "Change to be the Control Point".
7. Verify system is still functioning (i.e. calls can be made – between radios and a radio and console and optionally data calls can be made (e.g. radios can be 'pinged').
8. Verify that the RNM indicates the control point has moved to the site selected in step 6 and the previous control point is now a TX site. (note – a CP only site displays "zzzz" when it is not the active control point.)

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

10.2 DCP Control Point Movement in response to Faults at the Active Control Point

Purpose: **This test will demonstrate that the Control Point will move in response to failures at the active Control Point.**

Expected Results: **This test will verify that the DCP system will move the active Control Point to an alternate control point site when the active control point experiences failures. After the Control Point moves the old control point should drop into bypass and the rest of the system should operate normally as a Simulcast cluster.**

Setup: **The DCP system is operating with an active control point and is properly configured with at least two sites enabled to be the control point.**

Execution:

1. Verify system is functioning (i.e. calls can be made – between radios and a radio and console and optionally data calls can be made (e.g. radios can be 'pinged').

2. At the control point site disconnect the 1pps cable from GPS B.

3. Verify the system is still functioning (i.e. calls can be made – between radios and a radio and console and optionally data calls can be made (e.g. radios can be 'pinged') and control point has not moved. The traffic controllers at the control point display 'CC xx' and 'TC xx' when idle; at a satellite site the traffic controllers display "TR xx' where xx is the channel number. (>

4. At the control point site disconnect the 1pps cable from GPS A.

5. Verify that the control point moved to next ranked site and the old control point is now in bypass. The traffic controllers at the control point display 'CC xx' and 'TC xx' when idle: Any channels that are configured to be active at the old control point site when it is in bypass will have all their status LED red. In bypass all the traffic controllers display 'CC xx' and 'TC xx' when idle and the status LED will be red.

6. Verify the RNM indicates the new control point and shows the old control point site is now in bypass.

7. Verify the simulcast system is still functioning (i.e. calls can be made – between radios and a radio and console and optionally data calls can be made (e.g. radios can be 'pinged').

8. If the old control point has channels active in bypass, verify radios switched to this bypass site acquire the control channel and can communicate. (note – this step could be skipped; the bypass tests in sections 20.x will do this) >

9. Restore the connections to the GPS receivers at the site in bypass (the old control point site).

10. Verify that the site exits bypass and joins the simulcast cluster.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

11. P25 TRUNKED CALLS AND SITE FEATURES

Purpose: **These tests will verify that the site can provide radio communications at the site level.**

Expected Results: **These tests will demonstrate that the site can provide communications for radios.**

Setup: **All tests in this section assume that the UAS setup matches the configuration in this test. All testing in this section is to be done with phase 1 radios.**

11.1 Transmit Grant Tone

Purpose: **Demonstrate the system channel grant tone is heard on the radio.**

Expected Results: **This test will show that the radio will play a grant tone when the radio is assigned a working channel.**

Setup: **One radio with valid ID and a valid group on selected system. Grant tone (Ready to Talk tone) enabled in radio personality as applicable for specific radio type being tested.**

Execution:

1. Press PTT button on radio with valid group selected.

2. Verify grant tone is heard at radio when working channel access is granted.

Note: If the call is queued, the grant tone will be delayed until the call is assigned a working channel.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

11.2 Group Test Call

Purpose: **The Group Test Call will show that the site will allow a radio to communicate using a group call.**

Expected Results: **The test will demonstrate that all radios assigned to a common group will hear a call and all radios assigned to an uncommon group will not hear the call.**

Setup: **Set Radios 1, 2, and 3 to (Group A) per test group structure. Make sure Scan is turned OFF.**

Description	Radio LID	TG Description	TG ID
Radio 1	9980001	TG 64001 P25	64001
Radio 2	9980002	TG 64001 P25	64001
Radio 3	9980003	TG 64001 P25	64001

Execution:

1. PTT Radio 1 and talk.
   - ☐ The transmit (TX) indicators should turn on at Radio 1.
   - ☐ Audio should be heard in Radios 2 and 3.
   - ☐ The ID of Radio 1 should be seen on Radios 2 and 3.

2. Set Radio 3 to (TG64002 P25). PTT on Radio 1 and talk.
   - ☐ The transmit (TX) indicators should turn on at Radio 1.
   - ☐ Audio should be heard in Radio 2 only.
   - ☐ The ID of Radio 1 should be seen at Radio 2 only.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

11.3 Individual (Private) Call

Purpose: **The Individual Call test will verify that the site will allow two radios to communicate on a private call**

Expected Results: **This test will demonstrate that two radios can communicate on an individual call and other radios will not hear the private conversation.**

Setup: **Set Radios 1, 2, and 3 to (TG64001) per test group structure.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64001 P25	64001
Radio 3	998003	TG64001 P25	64001

Execution:

1. Using the Radio 1, select the pre-stored ID of Radio 2 or enter the Radio 2 ID directly from the keypad, and PTT Radio 1.
   - ☐ Verify that Radio 2 receives the call and displays the ID of Radio 1.
   - ☐ Verify that Radio 3 remains idle.
2. Release the PTT on Radio 1 and immediately PTT on Radio 2.
   - ☐ Verify that Radio 1 receives the call and displays the ID of Radio 2.
   - ☐ Verify Radio 3 remains idle.
3. Using the Radio 1, select the pre-stored ID of Radio 3 or enter the Radio 3 ID directly from the keypad, and PTT Radio 1.
   - ☐ Verify that Radio 3 receives the call and displays the ID of Radio 1.
   - ☐ Verify that Radio 2 remains idle.
4. Release the PTT on Radio 1 but do not immediately PTT Radio 3.
   - ☐ Verify that Radio 3 gives a Call Back Alert (WHC- “Who Has Called”) Indication.
5. Make the return call from Radio 3 back to Radio 1.
   - ☐ Verify that Radio 1 receives the call and displays the ID of Radio 3.
   - ☐ Verify Radio 2 remains idle.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

11.4 Transmission Trunking

Purpose: **This test will demonstrate that the System is working as a Transmission Trunking system.**

Expected Results: **The tests verify that the Control Channel will assign a working channel to the radio and that the radio and site will work as a trunking set.**

Setup: **Radios 1, 2, and 3 should be the only radios on the system.**

Monitor System channel assignment in RSM Site Activity Real-Time Viewer.

All Radios are registered on Site 1.

Description	Radio LID	TG Description	TG ID
Radio 1	9980001	TG 64001 P25	64001
Radio 2	9980002	TG 64001 P25	64001
Radio 3	9980003	TG 64001 P25	64001

Execution:

1. Log into RNM and start RSM Site Activity application in the real time viewer. Observe all channels on Site 1.

2. PTT Radio 1 and talk.
   - ☐ The transmit (TX) indicators should turn on at Radio 1.
   - ☐ Verify the number of the channel assigned.

3. PTT Radio 2 and talk.
   - ☐ The transmit (TX) indicators should turn on at Radio 2.
   - ☐ Verify the next channel is assigned.

4. PTT Radio 3 and talk.
   - ☐ The transmit (TX) indicators should turn on at Radio 3.
   - ☐ Verify the next channel is assigned.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

11.5 Message Trunking on Phase 1

Purpose: **This test will demonstrate that the system, for FMDA Phase 1 group calls, operates as Enhanced Message Trunking for Group Calls.**

Expected Results: **Verify that the system will assign the same working channel to a Message Trunking call if the next call happens within the Message Trunking hang time. During the hang time, the transmitting radio will return to the Control Channel for Phase 1 Group Calls.**

Setup: **Radios 1, 2, and 3 should be the only radios on the system. Each call needs to happen within 3 seconds of each other for this test to work.**
TG 64301 is a FDMA (Phase 1) MT Group.

Monitor System channel assignment in RSM Site Activity Real-time viewer.

Description	Radio LID	TG Description	TG ID	Site
Radio 1	9980001	TG 64301 P25	64301	1
Radio 2	9980002	TG 64301 P25	64301	1
Radio 3	9980003	TG 64301 P25	64301	1

Execution:

1. Log into RNM and start RSM Site Activity application in the real time viewer. Observe all channels on Site 1 for each of the steps below.

2. PTT Radio 1 and talk.
   - ☐ The transmit (TX) indicators (red light) should turn on at Radio 1.
   - ☐ On the RNM, observe the number of the channel assigned.
   - ☐ Verify audio from Radio 1 is heard at Radio 2 and Radio 3.

3. Un-PTT Radio 1.
   - ☐ Verify Radio 1's LED light turns off, no color, to indicate Radio 1 is on the Control Channel (CC), during the Hang Time. (This is Enhanced Message Trunking for FDMA).

4. PTT Radio 2, within the 3 second hang time, and talk.
   - ☐ The transmit (TX) indicators (red light) should turn on at Radio 2.
   - ☐ Verify the same channel is assigned, as in step 2.
   - ☐ Verify audio from Radio 2 is heard at Radio 1 and Radio 3.

5. Un-PTT Radio 2.
   - ☐ Verify Radio 2's LED light turns off, no color, to indicate Radio 2 is on the Control Channel (CC), during the Hang Time.

6. PTT Radio 3, within the 3 second hang time, and talk.
   - ☐ The transmit (TX) indicators (red light) should turn on at Radio 3.
   - ☐ Verify the same channel is assigned as in steps 2, & 4.
   - ☐ Verify audio from Radio 3 is heard at Radio 1 and Radio 2.

7. Un-PTT Radio 3
   - ☐ Verify Radio 3's LED light turns off, no color, to indicate Radio 3 is on the Control Channel (CC), during the Hang Time.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

11.6 Message Trunking on Phase 2

Purpose: **Demonstrate the system, for TDMA Phase 2 group calls, operates as Standard Message Trunking for Group Calls.**

Expected Results: **System will assign the same working channel to a Message Trunked call, if the next call happens within the Message Trunked hang time. During the hang time, the transmitting radio will remain on the Traffic (Working) Channel for Phase 2 Group Calls.**

Setup: **TDMA Enabled Radios 1, 2, and 3 should be the only radios on the system. Each call needs to happen within 3 seconds of each other for this test to work. TG 64353 is a TDMA (Phase 2) MT Group**

Monitor System channel assignment in RSM Site Activity Real-time Viewer.

Description	Radio LID	TG Description	TG ID	Site
Radio 1	9980001	TG 64353 P25	64353	1
Radio 2	9980002	TG 64353 P25	64353	1
Radio 3	9980003	TG 64353 P25	64353	1

Execution:

1. Log into RNM and start RSM Site Activity application in the real time viewer. Observe all channels on Site 1 for each of the steps below.

2. PTT Radio 1 and talk.
   - ☐ The transmit (TX) indicators (red light) should turn on at Radio 1.
   - ☐ On the RNM, observe the number of the channel assigned and the channel slot assigned.
   - ☐ Verify audio from Radio 1 is heard at Radios 2 and 3.

3. Un-PTT Radio 1
   - ☐ Verify Radio 1's LED Receive (RX) indicator turns green, to indicate Radio 1 remains on the Traffic (Working) channel, during the Hang Time.

4. PTT Radio 2, within the 3 second hang time, and talk.
   - ☐ The transmit (TX) indicators (red light) should turn on at Radio 2.
   - ☐ Verify the same channel / slot is assigned, as in step 2.
   - ☐ Verify audio from Radio 2 is heard at Radios 1 and 3.

5. Un-PTT Radio 2
   - ☐ Verify Radio 2's LED light turns green, to indicate Receive (Rx). Indicates Radio 2 remains on the Traffic (Working) channel, during the Hang Time.

6. PTT Radio 3, within the 3 second hang time, and talk.
   - ☐ The transmit (TX) indicators (red light) should turn on at Radio 3.
   - ☐ Verify the same channel / slot is assigned in steps 2 & 4.
   - ☐ Verify audio from Radio 3 is heard at Radios 1 and 2.

7. Un-PTT Radio 3
   - ☐ Verify Radio 3's LED light turns green, to indicate Receive (Rx). Indicates Radio 3 remains on the Traffic (Working) channel, during the Hang Time.
   - ☐ After the hang time expires, verify Radio 3's LED light turns off.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

11.7 Unit to Unit Call Alert Paging

Purpose: **To demonstrate that a radio can send a page to a different radio on the system.**

Expected Results: **This test will verify that radio 1 can send a page to radio 2**

Setup: **Radio 1 with Call Alert programmed into a button ("PAGE") and Radio 2's ID programmed into its Individual Call list. Radio 1 and Radio 2 on the same site.**

Execution:

1. Select the PAGE function from the MENU on Radio 1. Select Radio 2 from the preprogrammed list of radios and PTT Radio 1.

   - ☐ Verify Radio 1 displays "*TX PAGE" on the second line.
   - ☐ Verify Radio 2 displays the ID of Radio 1 on its first line and "*RX PAGE" on the second line.
   - ☐ Verify Radio 2 beeps multiple times to indicate a received page.
   - ☐ Verify Radio 1 beeps multiple times to indicate the page was successfully sent.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

11.8 Multi-site Announcement Group Call

Purpose: **This test will demonstrate that the system will allow a group call to function in a multi-site environment**

Expected Results: **The test will demonstrate that all radios assigned to a common group will hear a call, even though some of the radios are at distant sites and all radios assigned to an uncommon group will not hear the call**

Setup: **Groups 64101 and 64102 are in Announcement Group 64107 per test group structure. Ensure Scan is turned OFF.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64002 P25	64002
Radio 3	998002	TG64003 P25	64003

Execution:

1. PTT Radio 1 and talk.
2. The transmit (TX) indicators should turn on at Radio 1.
   - ☐ Audio should be heard on Radios 2 and 3.
   - ☐ ANNOUNCE should be displayed on Radios 2 and 3.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

11.9 Multisite Emergency Group Call

Purpose: **Demonstrate the capability of the system to process an emergency group call.**

Expected Results: **This test will verify that when a radio indicates an emergency group call. All other radios in the group indicate an emergency and the emergency can be cleared by an administrator radio.**

Setup: **Program 3 Radios with the same emergency home group. Set the supervisor (Radio 1) & Radio 2 to the home group. Set Radio 3 to a different group (not home group). A console will be used to clear the emergency.**

Description	Radio LID	TG Description	TG ID	Site
Radio 1	9980001	TG 64001 P25	64001	1
Radio 2	9980002	TG 64001 P25	64001	2
Radio 3	9980003	TG 64003 P25	64003	1

Execution:

1. Press the Emergency call button on Radio 1 and talk within the pre-defined Emergency Auto-key time, and/or PTT Radio 1 during or just after that time.

   - ☐ Verify that Radio 1 indicates the “TX EMER” declaration and that it reverts to the home group.
   - ☐ Verify that Radio 1 (on Site 1) and Radio 2 (on Site 2) indicate a “RX EMER” and hear audio on the emergency home group.
   - ☐ Verify Radio 3 does not display the emergency.

2. Clear the emergency with the Console.

   - ☐ Verify the emergency clears in the radios.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

11.10 System All Call

Purpose: **Demonstrate the capability of the system to route a call to all radios on the system.**

Expected Results: **This test will demonstrate the system's ability to route a single call to all available radios on the system.**

Setup: **Note: If want to create demand for a Full Rate All Call, then one radio must be on the Full Rate All Call.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	9980001	TG64000 P25	64000
Radio 2	9980002	TG64001 P25	64001
Radio 3	9980003	TG64002 P25	64002

Execution:

1. With Radio 1 place an Individual call to talk group 64000 (All Call Talk Group)

   - Audio should be heard at Radios 2 and 3.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

11.11 Transmit Denied (for Invalid radio ID)

Purpose: **This test is set up to demonstrate that a radio can be denied transmission on a site**

Expected Results: **This test will verify the system's ability to deny a radio to transmit on one site and allow the radio to work on a different site.**

Setup: **Program system so that radio ID is not valid on the site under test. Download database to site.**

Execution:

1. Program Radio 1 with an invalid ID
2. PTT Radio 1
   - ☐ Verify the radio is prohibited access to system.
3. Reprogram the radio to the original personality.

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

11.12 Single Site Call Queue Declaration Alert

Purpose: **This test will demonstrate the system queuing.**

Expected Results: **This test will verify that the system will assign users in a queue when the system has no available channels and assign users a working channel when the system has an available channel.**

Setup: **This test requires four radios and two working channels. Disable channels (if necessary) until there are two working channels at the site. This test is to be run with no other users on the system.**

Description	Radio LID	TG Description	TG ID
Radio 1	9980001	TG 64001 P25	64001
Radio 2	9980002	TG 64002 P25	64002
Radio 3	9980003	TG 64003 P25	64003
Radio 4	9980004	TG 64003 P25	64003

Execution:

1. Busy up all talk paths on the system with radio 1, and 2 by pressing and holding the PTT button.
2. With all talk paths busied, momentarily press and release the PTT button on test Radio 3
   - Verify that a Call Queued tone is heard at the radio.
3. Unkey (release PTT button) radio 2.
   - Verify that Radio 3 is assigned to the free talk path.
4. The grant tone is heard at the radio, without having to rekey the radio (repressing the PTT button).
5. Press the PTT button on Radio 3 within the auto key time applicable to the radio type (approx. 2 seconds) to keep the assigned channel.
   - Verify that audio from Radio 3 is heard at Radio 4.
6. Unkey all radios.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

11.13 Recent User Priority

Purpose: **Demonstrate system's ability to prioritize recent users in queueing situations.**

Expected Results: **When radios of the same priority level enter the queue, one that has been recently active will exit the queue first.**

Setup: **This test requires four radios and two working channels.**

Disable channels (if necessary) until there are two working channels at the site. Set the radio according to the table below. This test is to be run with no other users on the system and at intervals as set in the Recent Caller Interval (a time of greater than 10 seconds is recommended for the test which is configurable in the Traffic Controller module). This will only work if preformed quickly.

Description	Radio LID	TG Description	TG ID
Radio 1	9980001	TG 64001 P25	64001
Radio 2	9980002	TG 64002 P25	64002
Radio 3	9980003	TG 64003 P25	64003
Radio 4	9980004	TG 64004 P25	64004

Execution:

1. PTT and release Radio 1 (establish a recent user entry).
2. PTT Radios 3 and 4 and hold on transmit to busy both working channels.
3. PTT and release Radio 2 (queue a call less recent than Radio 1).
4. PTT and release Radio 1 (queue the recent user).
5. Unkey Radio 4
   - Verify that Radio 1 un-queues and transmits.
6. Unkey all radios.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

11.14 Call Priority for Group IDs

Purpose: **This test is set up to demonstrate the system's ability to allow a user with a higher priority to get assigned a channel before a user with a lower priority despite who enter the queue first.**

Expected Results: **This test will verify that a user that has a higher priority will get assigned a channel before users with a lower priority regardless of who entered the queue first. In this test radio 4 should get the first available channel, because it has a higher priority, and radio 3 will get assigned a channel next because it has a lower priority.**

Setup: **This test requires two working channels on the site. Disable channels (if necessary) until there are two working channels on the site. Setup the radio according to the table below. This test is to be run with no other users on the system.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	9980001	TG64001 P25	64001
Radio 2	9980002	TG64002 P25	64002
Radio 3	9980003	TG64004 P25	64003
Radio 4	9980004	TG64003 P25	64004

Execution:

1. PTT Radios 2 and 4 and hold on transmit to busy both working channels.
2. PTT and release Radio 1 (medium priority entry into the queue).
3. PTT and release Radio 3 (high priority entry into the queue).
4. Un-key Radio 4
   - Verify that Radio 3 un-queues and keys.
5. Un-key Radio 2
   - Verify that Radio 1 un-queues and keys.
6. Un-key all radios.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

11.15 Emergency Call Priority for Group IDs in Phase 1

Purpose: **Demonstrate the system's ability to allow a user with a higher priority to get assigned a channel before a user with a lower priority, despite who enters the queue first.**

Expected Results: **This test will verify that a user who has a higher priority will get assigned a channel before users with a lower priority regardless of who entered the queue first. In this test radio 4 should get the first available channel, because it has a higher priority, and radio 3 will get assigned a channel next because it has a lower priority.**

Setup: **This test requires two working channels on the site. Disable channels (if necessary) until there are two working channels on the site. Setup the radio according to the table below. This test is to be run with no other users on the system.**

Description	Radio LID	TG Description	TG ID
Radio 1	9980001	TG 64001 P25	64001
Radio 2	9980002	TG 64002 P25	64002
Radio 3	9980003	TG 64003 P25	64003
Radio 4	9980004	TG 64004 P25	64004

Execution:

1. PTT Radios 4 and 3 and hold on transmit to busy both working channels.
2. PTT and release Radio 2 (high priority entry into the queue).
3. Declare an emergency on Radio 1 (medium priority entry into the queue but now at Emergency Priority).
4. Un-key Radio 4
   - Verify that Radio 1 un-queues and is assigned a channel without having to PTT. (Key the radio within the specified auto key time in order to keep the channel.)
5. Un-key all radios and clear the emergency with the Radio 1.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

11.16 Group Scan

Purpose: **Verify when scan is enabled, calls from groups in the radio's scan list are received.**

Expected Results: **In this test the radio will play calls from multiple talk groups while scan is enabled**

Setup: **All radios for this test need to have scan ability.**

Radio 1 set up with TG64001 P25 and TG64002 P25 in the scan list, TG64001 P25 selected, and Group scan initially disabled.

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64002 P25	64001

Execution:

1. Place a call from Radio 2 on talk TG64001 P25.
   - ☐ Verify the call is received and audio is heard on Radio 1.
2. Place a call from Radio 2 on talk TG64002 P25.
   - ☐ Verify the call is not received by Radio 1.
3. Enable group scan on Radio 1.
4. Place another call from Radio 2 on talk TG64002 P25.
   - ☐ Verify that the call is now received, and audio is heard on Radio 1.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

11.17 Priority Scan

Purpose: **Demonstrate groups assigned a higher priority in the scan list override groups of a lower priority.**

Expected Results: **Radio will play calls with a higher level of priority.**

Setup: Set Radio 1 to priority scan TG64001 P25, and scan (at lower priority – 3 bars) TG64002 P25. Set Radio 1 to TG64003. Have scan enabled on Radio 1.

Description	Radio LID	TG Description	TG ID
Radio 1 (SCAN)	9980001	TG 64003 P25	64003
Radio 2	9980002	TG 64002 P25	64002
Radio 3	9980003	TG 64001 P25	64001

Execution:

1. Have Radio 1 selected to TG64003 P25. Place a call from Radio 2 on TG64002 P25.
   - ☐ Verify Radio 1 scans to TG64002 P25 and hears audio from Radio 2. Continue transmitting from Radio 2.

2. Place a call from Radio 3 on TG64001 P25. [Radio 2 is still transmitting on TG64002 P25.]
   - ☐ Verify Radio 1 priority scans to TG64001 P25 and hears audio from Radio 3.

3. Unkey all radios and turn off scan.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

11.18 Transmit Busy Lockout

Purpose: **Demonstrate a radio cannot key on a group, on which a group call is already active.**

Expected Results: **A radio will not be allowed to transmit on a talk group while a different radio is transmitting on the same talk group.**

Setup: **Talk group used for test must be set up as Transmission Trunked. This feature does not apply to Message Trunked calls.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64001 P25	64001

Execution:

1. Place a call from Radio 1 on selected talk group by pressing and holding the PTT button.

   ☐ Verify the call is received and audio is heard on Radio 2.

2. While the call is in progress, press the PTT button on Radio 2.

   ☐ Verify that Radio 2 does not transmit over (step on) the call-in progress. (A double bump busy sound will be heard).

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

11.19 Continuous Control Channel Update

Purpose: **This test will demonstrate that a radio will join a call that is already in progress**

Expected Results: **This test will verify that a radio will join a call that is already in progress.**

Setup:

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64001 P25	64001

Execution:

1. Set both radios to the test group.
2. Turn radio 2 OFF.
3. Key radio 1 and hold. Turn ON the radio 2 (and set it to the test group if necessary).
   - ☐ Verify that the second radio joins the call-in progress and hears audio from the call-in progress.
4. Unkey radio 1.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

11.20 Convert to Callee

Purpose: **Demonstrate when radios are simultaneously keyed, only one radio is given talk privilege.**

Expected Results: **When two radios on the same talkgroup are keyed simultaneously, only one radio will receive access to the working channel. The other radio will play the audio from the first.**

Setup: **Test of single site simultaneous call arbitration.**
Radio 1 and Radio 2 are registered on the same site and TG.

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64001 P25	64001

Execution:

1. Set two radios to the same site and group.
2. Key both radios at the same time.
   - ☐ Verify that one radio ends up transmitting and the other ends up receiving.
   - ☐ Verify that the call audio is routed and received by one of the units even though the PTT is pressed.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

11.21 Multi-site Routing (for Multi-site Logout)

Purpose: **Demonstrate the system will not route a call to a site if all the radios logged into the site have moved to a different site.**

Expected Results: **When the radio moves away from a site, the system will not route calls to the site that it has roamed away from.**

Setup: **Site 1 and 2 should be selected such that Radio 2 can log into Site 1 and then Site 2. If coverage prevents this, then program a third radio with the ID of Radio 2. Use the third radio to key on Site 1 with the ID of Radio 2 whenever the test procedure calls for this. The primary objective of this test is to demonstrate that the system routes calls to Site 2 whenever a unit (i.e. radio 2) is logged onto Site 2 and does not route calls to Site 2 when no units are logged into Site 2. Radio 1 logged in to Site 1 and Radio 2 logged into Site 2.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG641001 P25	64001
Radio 2	998002	TG641001 P25	64001

Execution:

1. Key Radio 1 on Site 1.
   - ☐ Verify channel assignments occur on Site 2. Un-key radio.
2. Switch Radio 2 to site 1.
3. Key Radio 1 on site 1.
   - ☐ Verify no channel assignment on site 2

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

11.22 Site Trunking (Failsoft) Indication

Purpose: **Demonstrate that radio displays a Failsoft Icon, when the site is unable to communicate with the system/network.**

Expected Results: **This test will verify that the radio will display an 'F' when the site it is logged into is not connected to the system.**

Setup: **Radios must be programmed to display Failsoft.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID	Site #
Radio 1	998001	TG641001 P25	64001	1
Radio 2	998002	TG641001 P25	64001	1
Radio 3	998003	TG641001 P25	64001	2

Execution:

1. PTT Radio 1

   ☐ Verify that the Radio 1, Radio 2, and Radio 3 can communicate on the system.

2. Disconnect the network connection from the Network Switching Center to the Site Router, causing loss of communication from the site back to the Network Switching Center.

   ☐ Verify that Radio 1 and Radio 2 indicate a Failsoft alarm ("F") on their displays this may take several minutes.

3. PTT Radio 1 on Talkgroup A. Verify audio is heard at Radio 2. Verify audio is not heard on Radio 3.

4. Re-connect the network from the Network Switching Center to the Site Router.

   ☐ Verify the Failsoft alarm disappears on the radios and that communications with Radio 3 is reestablished.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

11.23 Unconfirmed Call (Multisite Late-Enter)

Purpose: **Verify a radio will late enter an ongoing group call made from another site.**

Expected Results: **A radio creates demand for talkgroups even when no channels are available at a site. Ongoing calls on a talkgroup will be joined as channel resources become available.**

Setup: **Site 1 should only have one working channel, disable all other working channels at site 1.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID	Site #
Radio 1	998001	TG64001 P25	64001	1
Radio 2	998002	TG64002 P25	64002	1
Radio 3	998003	TG64001 P25	64001	2
Radio 4	998004	TG64001 P25	64001	2

Execution:

1. Key up radio 2 on site 1 and hold the call up.

2. Key up Radio 3 on TG64001 on Site 2 and hold the call up.
   - ☐ Verify that Radio 3 should get the grant tone and the call should go through to Radio 4 on Site 2.
   - ☐ Since Site 1 has no channels available, the call should not go through to Radio 1 on Site 1.

3. While Radio 2 is still keyed up, free up a channel on Site 1 by unkeying radio 2.
   - ☐ Verify that the call gets routed to Site 1 and that Radio 1 late-enters into the call on that site.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

11.24 Confirmed Call

Purpose: **This test will demonstrate that the system will allow confirmed calls.**

Expected Results: **When a radio attempts PTT it will get a wait tone until there are available channels at all site that have demand for the call, or the confirmed call timer expires.**

Setup: **Additional radios maybe required for this test, this test requires two more radios than the number of channels available at the site to be tested.**

Site 1 should only have one working channel, disable all other working channels at site 1.

Radio Description	Radio Lid	Talk Group Description	Talk Group ID	Site #
Radio 1	998001	TG64001 P25	64101	1
Radio 2	998002	TG64002 P25	64002	1
Radio 3	998003	TG64001 P25	64101	2
Radio 4	998004	TG64001 P25	64101	2

Execution:

1. Key up Radio 2 on site 1 and hold the call up.
2. Key up Radio 3 on TG64001 on Site 2 and hold the call up.
   - The call will not be granted because there are no available channels on site 1.
3. Hold the call up until the confirmed call timer expires.
   - Once the timer expires the call will go through but only to site 2 only
4. While Radio 2 is still keyed up, free up a channel on Site 1 by unkeying radio 2.
   - Verify that the call gets routed to Site 1 and that Radio 1 late-enters into the call.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

12. LOCAL EMERGENCY CHANNEL ASSIGNMENT

12.1 Local Emergency Multisite Phase 1 System (FDMA) [Non-Single Cell Simulcast/Multisite Only]

Purpose: **This test is set up to demonstrate the multisite FDMA emergency channel assignment.**

Expected Results: **This test will verify that the system will not drop a channel to assign a channel an emergency in FDMA mode.**

Setup: **This test requires six radios and two working talk paths on the site. Disable channels (if necessary) until there is only two working talk paths on the site.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID	Site #
Radio 1	9980001	TG64101 P25	64101	1
Radio 2	9980002	TG64102 P25	64102	1
Radio 3	9980003	TG64103 P25	64103	1
Radio 4	9980004	TG64101 P25	64101	2
Radio 5	9980005	TG64102 P25	64102	2
Radio 6	9980006	TG64103 P25	64103	2

Execution:

1. Disable channels at site 1 and 2 so that only the site only has two working FDMA talk paths.
2. PTT Radio 1 & 2 to busy up the sites.
3. Declare an emergency on Radio 3.
   - Radio 3 Should enter the Queue.
4. Un-key Radio 4
   - Verify Radio is assigned the call
5. Un-key all radios and clear the emergency with the Radio 1.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

12.2 Local Emergency Multisite Phase 2 (TDMA)

Purpose: **This test is set up to demonstrate the multisite TDMA local emergency channel assignment.**

Expected Results: **This test will verify that the system will drop a local channel to assign a channel an emergency in TDMA mode.**

Setup: **This test requires six radios and two working talk paths on the site. Disable channels (if necessary) until there is only two working talk paths on the site.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID	Site #
Radio 1	9980001	TG64151 P25	64151	1
Radio 2	9980002	TG64152 P25	64152	1
Radio 3	9980003	TG64153 P25	64153	1
Radio 4	9980004	TG64151 P25	64151	2
Radio 5	9980005	TG64152 P25	64152	2
Radio 6	9980006	TG64153 P25	64153	2

Execution:

1. Disable channels at site 1 and 2 so that only the site only has two working TDMA talk paths.
2. PTT Radio 1 & 2 to busy up the sites.
3. Declare an emergency on Radio 3.
   - ☐ Verify call is dropped to Radio 1 and tone is heard
   - ☐ Verify Radio 3 is assigned a channel / one TDMA slot.
   - ☐ Verify a console hears calls from Radio 2 and 3
4. Un-key all radios and clear the emergency with the Radio 1.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

12.3 Remote Emergency Multisite System Phase 2 (TDMA)

Purpose: **This test is set up to demonstrate the multisite TDMA emergency channel assignment.**

Expected Results: **This test will verify that the system will not drop a remote channel to assign a channel an emergency in TDMA mode.**

Setup: **This test requires six radios and two working talk paths on the site. Disable channels (if necessary) until there is only two working talk paths on the site.**

Description	Radio LID	TG Description	TG ID	Site
Radio 1	9980001	TG 64151 P25	64151	1
Radio 2	9980002	TG 64152 P25	64152	1
Radio 3	9980003	TG 64153 P25	64153	1
Radio 4	9980004	TG 64151 P25	64151	2
Radio 5	9980005	TG 64152 P25	64152	2
Radio 6	9980006	TG 64153 P25	64153	2

Execution:

1. Disable channels at site 1 and 2 so that only the site only has two working TDMA talk paths.
2. PTT Radio 4 & 5 to busy up the sites.
3. Declare an emergency on Radio 3.
   - ☐ Verify audio is dropped to Radio 1
   - ☐ Verify calls from radio 4 and 5 continue
   - ☐ Verify Radio 3 is assigned a channel
   - ☐ Verify a console hears calls from Radio 3, 4 and 5
4. Un-key all radios and clear the emergency with the Radio 1.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

13. TRANSCODER TEST

Purpose: **This test will demonstrate the transcoder ability to transcode calls made with different vocoders**

Expected Results: **This test will verify that the transcoder is needed to transcode a call, and each transcoder will transcode calls.**

Setup:

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	9980001	TG 64400OS	64400
Console 9110	9989110	TG 64400OS	64400

Execution:

1. Shutdown s0u1xcda.vida.local, s0u2xcda.vida.local and s0u1xcdb.vida.local.

Transcoder	State
s0u1xcda.vida.local	Off
s0u2xcda.vida.local	Off
s0u1xcdb.vida.local	Off

2. From the console place a call on talk group 64400OS
   - Verify that the call is not heard on a P25 radio on talk group 6400OS, this called failed because there is no working transcoder.

3. Restart s0u1xcda.vida.local.

Transcoder	State
s0u1xcda.vida.local	On
s0u2xcda.vida.local	Off
s0u1xcdb.vida.local	Off

4. From the console place a call on talk group 64400OS
   - Verify that the call is heard on a P25 radio

5. Restart s0u2xcda.vida.local wait for 15 minutes for services to start

6. Shutdown s0u1xcda.vida.local.
7.

Transcoder	State
s0u1xcda.vida.local	Off
s0u2xcda.vida.local	On
s0u1xcdb.vida.local	Off

8. From the console place a call on talk group 64400OS
   - Verify that the call is heard on a P25 radio on talk group 6400OS this call is using s0u2xcda.vida.local.

9. Restart s0u1xcdb.vida.local

10. Shutdown s0u1xcda.vida.local

Transcoder	State
s0u1xcda.vida.local	Off
s0u2xcda.vida.local	Off
s0u1xcdb.vida.local	On

11. From the console place a call on talk group 64400OS
   - Verify that the call is heard on a P25 radio on talk group 6400OS this call is using s0u3xcda.vida.local.

12. Restart s0u2xcda.vida.local and s0u1xcda.vida.local

13. From the console place a call on talk group 64400OS verify that the call is heard on a P25 radio on talk group 6400OS

Transcoder	State
s0u1xcda.vida.local	On
s0u2xcda.vida.local	On
s0u1xcdb.vida.local	On

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

14. P25 PHASE 2 FUNCTIONALITY (Single Site/Simulcast Single Site)

Purpose: **The tests below verify that the P25 Phase 2 implementation provides the additional traffic channel capacity and features of P25 Phase 2 while allowing backwards compatibility with Phase 1 radios and talkgroups.**

Expected Results: **This will verify that a P25 Phase 1 call will work on a Phase 2 system**

Setup: **In the following tests, portables 1 and 2 will be set up as Phase 1 only. Portables 3 and 4 will be set up as Phase 2 and Phase 1 capable, depending upon talk-group. FDMA refers to Phase 1 and TDMA refers to Phase 2. Start a session on the RNM and setup to watch channel assignments using the real time viewer function.**

On a client computer, open the windows internet explorer and browse to https://s0u1rnm.vida.local/nmc and log in with an Active Directory account. Choose the system map and select the 'Launch Application' button. Open the Realtime tab and Click Site Calls. Select the site and expand. Check the box next to the channels and select the to add the channels to the target list. Select the 'ok' button to launch the application. Place a group call from Radio 1 to Radio 2 on the site, and verify that the event viewer displays the talkgroup ID and calling party ID. Verify the state changes from Free to Talk. Verify the TG Alias displays the Group #.

Radio Description	Radio Lid	Talk Group Description	Talk Group ID	System
Radio 1	998001	TG64051 P25	64051	MAC PH 1
Radio 2	998002	TG64051 P25	64051	MAC PH 1
Radio 3	998003	TG64051 P25	64051	MAC PH 2
Radio 4	998004	TG64051 P25	64051	MAC PH 2

14.1 Mixed Mode site to Mixed Mode site Call Phase 1- Phase 1

Purpose: **Demonstrates that a Phase 1 call will work on a Phase 2 system**

Expected Results: **This will verify that a P25 Phase 1 call will work on a Phase 2 system**

Setup: **Turn off radios 3 and 4.**

Execution:

1. PTT Radio 1 and talk. The transmit (TX) indicators should turn on at Radio 1

   - ☐ Verify that the call is assigned as an FDMA by viewing the Real Time Viewer Site Activity on the RNM.

   - ☐ Verify Radios 2 can hear Radio 1.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

14.2 Mixed Mode site to Mixed Mode site Call - Phase 1 and Phase 2

Purpose: **Demonstrates that a mixed mode call can function on a Phase 2 system**

Expected Results: **This test will verify that a Phase 2 radio will hear a call from a Phase 1 radio.**

Setup: **Turn on Radios 1, 2, 3, 4**

Execution:

1. PTT Radio 1 and talk. The transmit (TX) indicators should turn on at Radio 1

   - ☐ Verify that the call is assigned as an FDMA by viewing the Real Time Viewer Site Activity on the RNM.

   - ☐ Verify Radios 2, 3 and 4 can hear Radio 1.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

14.3 Mixed Mode site to Mixed Mode site Call - Phase 1

Purpose: **Demonstrates that a mixed mode call can function on a Phase 2 system**

Expected Results: **This test will verify that a Phase 1 radio will hear a call from a Phase 2 radio.**

Setup: **Turn on Radios 1, 2, 3, 4**

Execution:

1. PTT Radio 3 and talk. The transmit (TX) indicators should turn on at Radio 3

   - ☐ Verify that the call is assigned as an FDMA by viewing the Real Time Viewer Site Activity on the RNM.

   - ☐ Verify Radios 1, 2 and 4 can hear Radio 3.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

14.4 Phase 2 site Call

Purpose: **Demonstrates that a Phase 2 call work on a Phase 2 system**

Expected Results: **This will verify that a P25 Phase 2 call will work on a Phase 2 system**

Setup: **Turn off Radios 1, and 2**

Execution:

1. PTT Radio 3 and talk. The transmit (TX) indicators should turn on at Radio 3

   - ☐ Verify that the call is assigned as an TDMA by viewing the Real Time Viewer Site Activity on the RNM.

   - ☐ Verify Radios 4 can hear Radio 1.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

15. P25 PHASE 2 FUNCTIONALITY

Purpose: **The tests will show that the system will allow radios that are on different sites to communicate while the radios are on different phases on P25.**

Expected Results: **This test will verify that the system will allow Phase 1 and Phase 2 radio to inter communicate.**

Setup: **In the following tests, portables 1 and 2 will be set up as Phase 1 only. Portables 3 and 4 will be set up as Phase 2 and Phase 1 capable, depending upon talk-group. FDMA refers to Phase 1 and TDMA refers to Phase 2. Start a session on the RNM and setup to watch channel assignments using the real time viewer function.**

On a client computer, open the windows internet explorer and browse to https://s0u1rnm.vida.local/nmc and log in with an Active Directory account. Choose the system map and select the 'Launch Application' button. Open the Realtime tab and Click Site Calls. Select the site and expand. Check the box next to the channels and select the to add the channels to the target list. Select the 'ok' button to launch the application.

Place a group call from Radio 1 to Radio 2 on the site and verify that the event viewer displays the talk-group ID and calling party ID. Verify the state changes from Free to Talk. Verify the TG Alias displays the Group #.

Radio Description	Radio Lid	Talk Group Description	Talk Group ID	System	Site	On/Off
Radio 1	998001	TG64051 P25	64051	MAC PH 1	1	On
Radio 2	998002	TG64051 P25	64051	MAC PH 1	1	On
Radio 3	998003	TG64051 P25	64051	MAC PH 2	2	On
Radio 4	998004	TG64051 P25	64051	MAC PH 2	2	On

15.1 Mixed Mode site to Mixed Mode site Call Phase 1- Phase 1

Purpose: **Demonstrates that a Phase 1 call work on a Phase 2 system**

Expected Results: **This will verify that a P25 Phase 1 call will work on a Phase 2 system**

Setup: **Turn off radios 2 and 4.**

Description	Radio LID	TG Description	TG ID	System	Site	On/Off
Radio 1	9980001	TG 64051 P25	64051	MAC PH 1	1	On
Radio 2	9980002	TG 64051 P25	64052	MAC PH 2	1	Off
Radio 3	9980003	TG 64051 P25	64051	MAC PH 1	2	On
Radio 4	9980004	TG 64051 P25	64052	MAC PH 2	2	Off

Execution:

1. PTT Radio 1 and talk.

   - ☐ The transmit (TX) indicators should turn on at Radio 1
   - ☐ Verify that the call is assigned as FDMA at Site 2 by viewing the Real Time Viewer Site Activity on the RNM.
   - ☐ Verify Radio 3 can hear Radio 1.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

15.2 Mixed Mode site to Mixed Mode site Call - Phase 1 and Phase 2

Purpose: **Demonstrates that a mixed mode call can function on a Phase 2 system**

Expected Results: **This test will verify that Phase 2 radios will hear a call from a Phase 1 radio.**

Setup: **Turn on Radios 1, 2, 3, 4**

Description	Radio LID	TG Description	TG ID	System	Site	On/Off
Radio 1	9980001	TG 64051 P25	64051	MAC PH 1	1	On
Radio 2	9980002	TG 64051 P25	64051	MAC PH 1	1	On
Radio 3	9980003	TG 64051 P25	64051	MAC PH 2	2	On
Radio 4	9980004	TG 64051 P25	64051	MAC PH 2	2	On

Execution:

1. PTT Radio 1 and talk.

   - ☐ The transmit (TX) indicators should turn on at Radio 1
   - ☐ Verify that the call is assigned as an FDMA at site 2 by viewing the Real Time Viewer Site Activity on the RNM.
   - ☐ Verify Radios 2, 3 and 4 can hear Radio 1.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

15.3 Mixed Mode site to Mixed Mode site Call - Phase 1

Purpose: **Demonstrates that a mixed mode call can function on a Phase 2 system.**

Expected Results: **This test will verify that a Phase 1 radio will hear a call from a Phase 2 radio.**

Setup: **Turn on Radios 1, 2, 3, 4**

Description	Radio LID	TG Description	TG ID	System	Site	On/Off
Radio 1	9980001	TG 64051 P25	64051	MAC PH 1	1	On
Radio 2	9980002	TG 64051 P25	64051	MAC PH 1	1	On
Radio 3	9980003	TG 64051 P25	64051	MAC PH 2	2	On
Radio 4	9980004	TG 64051 P25	64051	MAC PH 2	2	On

Execution:

1. PTT Radio 3 and talk.

   - ☐ The transmit (TX) indicators should turn on at Radio 3
   - ☐ Verify that the call is assigned as an FDMA at site 2 by viewing the Real Time Viewer Site Activity on the RNM.
   - ☐ Verify Radios 1, 2 and 4 can hear Radio 3.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

15.4 Phase 2 site Call

Purpose: **Demonstrate that a Phase 2 call works on a Phase 2 system.**

Expected Results: **Verify that a P25 Phase 2 call will work on a Phase 2 system.**

Setup: **Turn off Radios 1 and 2**

Description	Radio LID	TG Description	TG ID	System	Site	On/Off
Radio 1	9980001	TG 64051 P25	64051	MAC PH 1	1	Off
Radio 2	9980002	TG 64051 P25	64051	MAC PH 1	1	Off
Radio 3	9980003	TG 64051 P25	64051	MAC PH 2	2	On
Radio 4	9980004	TG 64051 P25	64051	MAC PH 2	1	On

Execution:

1. PTT Radio 3 and talk.

   - ☐ The transmit (TX) indicators should turn on at Radio 3
   - ☐ Verify that the call is assigned as a TDMA at Site 1 by viewing the Real Time Viewer Site Activity on the RNM.
   - ☐ Verify Radios 1, 2, & 4 can hear Radio 3.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

16. SYMPHONY DISPATCH FEATURE SET

All Testing done in this section should be done with a user that is in the 'Console' User Group.

16.1 Transmitting With a Microphone (Group Calls, I Calls)

Purpose: **Confirms the console operator can initiate communication with a terminal radio using the console select functions and foot pedal, for both Group and I Calls.**

Expected Results: **Confirms communication with the terminal radio**

Setup: **Radio set to TG64001 P25 and console programmed with talk groupTG64001 P25**

Execution:

1. Press the INSTANT TX function (for example right mouse button) on the module with the test group. Verify
   - ☐ that a channel access tone is heard, a
   - ☐ ripple effect on the 'TX' indicator is displayed
   - ☐ that the call is heard on the radio.
2. Release the Instant TX key
3. Right click on the gear symbol for TG64002 and select 'Select' to make TG64002 the selected talk group. Verify
   - ☐ that the module for TG64002 is highlighted indicating that it is the selected talk group
   - ☐ the module at the top center of the screen changes to 'TG64002'
4. Make call on 64002TG by:
   a. Press the PTT foot pedal.
      - ☐ verify that a channel access tone is heard,
      - ☐ the halo around the 'TX' indicator is displayed
      - ☐ that the call is heard on the radio
      - ☐ verify audio is head at a radio on talk group 64002TG

      i. Release the foot pedal to end the call

   b. Press the headset button.

- ☐ verify that a channel access tone is heard
- ☐ the halo around the 'TX' indicator is displayed
- ☐ that the call is heard on the radio
- ☐ verify audio is head at a radio on talk group 64002TG

i. Release the headset button to end the call.

c. Select the 64002TG button with the mouse.

- ☐ verify that a channel access tone is heard
- ☐ the halo around the 'TX' indicator is displayed
- ☐ that the call is heard on the radio
- ☐ verify audio is head at a radio on talk group 64002TG

i. Release the mouse button to end the call.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

16.2 Receiving Calls (Unit ID Display, Talk group ID Display, Aliasing)

Purpose: **Confirm the console operator can receive communications from a terminal radio, using both talkgroup and individual calling.**

Expected Results: **Communications are initiated and received on the appropriate speaker (select or unselect) and the radio's ID is displayed.**

Setup: **Console should have talk groups 64001TU and 64002TU programmed with 64002TU selected and Radio set to TG64001 P25**

16.2.1 Talk Group Call

Execution:

1. Key the radio and verify
   - ☐ That the call is heard at the unselect speaker
   - ☐ That the calling radio ID is displayed on the module for TG64001
   - ☐ A green light id displayed indicating an incoming call on module TG64001
2. Switch the radios talk group to 64002TU and key the radio.
   - ☐ That the call is heard at the select speaker
   - ☐ That the calling radio ID is displayed on the module for TG64002
   - ☐ A green light id displayed indicating an incoming call on module TG64002

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

16.2.2 Individual Call (Unit – Unit)

Execution:

1. Right click on the 'Harris' box on the top left-hand side of the screen.
2. Select 'Open Directory' this will open a pop-up window for the 'Directory'
3. Select the 'Users' tab
4. Select 'Radio 1' under the "ALIAS' column
5. Press the 'Radio 1' button the right side to the screen to place an individual call to radio 1.
   - ☐ Verify the ripple effect on the 'TX' indicator is displayed
   - ☐ Verify a ringing tone will be heard at the console and the radio
   - ☐ Verify radio displays 'INDV' and consoles 'ID"
6. Respond to the console by PTTing the radio
   - ☐ Verify that the call is heard on the console and that the calling radio's ID and the Call Indicator are displayed.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

16.3 Emergency Call and Emergency Alarm

Purpose: **Confirms the console indicates an emergency declared by a terminal radio and can reset and clear the emergency.**

Expected Results: **The console indicates and can clear the emergency.**

Setup: **This test requires a test radio capable of generating and clearing an emergency (i.e. Supervisor Radio).**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001

Execution:

1. Select the 64002TG in the console. Using the test radio, declare an emergency on 64001TG.
   - ☐ Verify the module for '64001TG' turns red,
   - ☐ Verify the ID/Name of the test radio is displayed
   - ☐ Verify emergency alert tone is heard on the console.
2. Select the triangle with a '!' to access the emergency menu.
   - ☐ the acknowledge 'Ack' button is red
   - ☐ the check box is red
3. Using the radio, transmit on the talk group
   - ☐ Verify that the call is received by the console.
4. With the console, transmit on the group with the emergency.
   - ☐ Verify the test radio receives the call and is still in emergency mode.
5. Acknowledge the emergency by selecting the 'Ack' button
   - ☐ Verify the button changes from 'Ack' to clear
   - ☐ verify the radio and the console are still in emergency mode
6. Clear the emergency by selecting the 'Clear X' button

- ☐ Verify the console clears the emergency
- ☐ Verify the radio clears the emergency

7. Transmit on the radio
8. Verify the emergency is cleared and normal group calls have resumed.
9. Select 64001TG group selected on the console, declare an emergency on the test group by pressing the 'Emer Declare'.
   - ☐ Verify the console and radio have the same indications as steps 2 to 4.
10. Acknowledge by hitting 'Ack' in step 4
11. Clear the emergency with the console.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

16.4 System Wide Call (All Call & Announcements)

Purpose: **Confirm the console can initiate system wide calls.**

Expected Results: **The console can initiate both All Calls and Announcement Calls.**

Setup: **Program console modules with the 'TG64000 P25' talk group**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64051 P25	64051
Radio 2	998002	TG64052 P25	64052
Radio 3	998003	TG64001 P25	64001
Radio 4	998004	TG64001 P25	64002

Execution:

1. Press INSTANT TX on the module with 'TG64000 P25'.
   - Verify that a channel access tone is heard,
   - Verify the ripple effect on the 'TX' indicator is displayed
   - Verify that the call is heard at all radios
2. Release the Instant TX key.
3. Press INSTANT TX on the module with 'TG64051 P25'.
   - Verify that a channel access tone is heard,
   - Verify the ripple effect is displayed
   - Verify the call is heard at Radios 1. Verify Radios 2, 3
   - Verify radio 4 did not hear the audio.
4. Release the Instant TX key.
5. Press INSTANT TX on the module with 'TG64001 P25'.
   - Verify that a channel access tone is heard,

- ☐ The ripple effect is displayed,
- ☐ The call is heard at Radios 3.
- ☐ Verify that Radios 1 2
- ☐ Radio 4 did not hear the audio.

6. Release the Instant TX key.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

16.5 Alert Tones

Purpose: **Confirm the console can initiate alert tones which can be heard at the terminal radio.**

Expected Results: **The tones can be initiated and heard.**

Setup: **Console 1 programmed with TG64002 and TG64001 selected.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64002 P25	64002

Execution:

1. Make TG64001 P25 the selected talk group.
2. Select the tones tab on the talk group module.
3. Select one of the three ALERT TONE keys by selecting the drop-down list next to the orange button the console with a method other than the mouse.
4. Radio 1 will receive the call.
5. Test that all three alert tones can be heard on the radio.
   - ☐ Verify the ALERT TONE is received by Radio 1 and also heard on the console (to hear the tones on the console, press and hold the foot pedal and listen for the tone on the SELECT speaker).
6. When the ALERT TONE key is released
   - ☐ Verify the call on Radio 1 drops

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

16.6 Console Pre-Empt

Purpose: **Confirm the console can pre-empt an ongoing call between terminal radios.**

Expected Results: **The call started by the radio will be interrupted by the console.**

Setup: **Console 1 programmed with talk-group TG64001 P25**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	9981001	TG64001 P25	64001
Radio 2	9981002	TG64001 P25	64001

Execution:

1. Key Radio 1 on the TG64001 and hold the call up. Verify that audio is heard at Radio 2 and the console.

2. Key the console on TG64001and hold the while continuing to hold the call up on Radio 1

   - ☐ Verify the console pre-empts
   - ☐ Verify that the transmit indicator is displayed along with the pre-empted caller LID and CALL indicator
   - ☐ Verify that the second radio begins to hear the console audio and not the first radio call.
   - ☐ Verify that the pre-empted radio audio is still heard on the pre-empting console.

3. Un-key the first Radio.

   - ☐ Verify that the pre-empted caller LID and CALL indicators are removed, and the pre-empted radio audio is no longer heard on the pre-empting console.

4. Un-key the console.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

16.7 Simulselect

Purpose: **Confirms operation of the console Simulselect feature, which allows multiple talk groups to be selected for communication simultaneously.**

Expected Results: **The console can select multiple talk groups and communication is allowed.**

Setup **Console 1 programmed with talk groups TG64051 P25, TG64052 P25, TG64053 P25, and TG64054 P25.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64051 P25	64051
Radio 2	998002	TG64052 P25	64052
Radio 3	998003	TG64001 P25	64001
Radio 4	998004	TG64001 P25	64002

Execution:

1. Create simulselect group on the 4 test group modules
2. Place a call from the console on the simulselect group
   - ☐ Verify that the call is heard all four radios
3. Place a call from each radio
   - ☐ Verify that only the console hears the calls
   - ☐ Verify only the radios on similar talk groups here the call
4. Deactivate the simulselect group.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

16.8 Patch

Purpose: **Confirms the console patch feature creates shared communication between multiple selected talk groups.**

Expected Results: **The patched talk groups can communicate.**

Setup **Console 1 programmed with talk groups TG64051 P25, TG64052 P25, TG64053 P25, and TG64054 P25.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64051 P25	64051
Radio 2	998002	TG64052 P25	64052
Radio 3	998003	TG64001 P25	64001
Radio 4	998004	TG64001 P25	64002

Execution:

1. Create patch on PATCH 1 with all four groups above.
2. Place a call from the newly created patch
   - ☐ Verify that the call is heard on all the radios
3. Place a call from each radio
   - ☐ Verify that the call is heard on the console and each radio.
4. Deactivate the patch.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

16.9 Console to Console Cross-mute

Purpose: **Confirm creation of a cross-mute of another console to quiet the muted consoles audio on the local console.**

Expected Results: **The cross-muted console's audio cannot be heard on the local console.**

Setup: **Establish two consoles (A and B) to test the Crossmute function. The Consoles must be on the same NSC. Program and select a test group on both consoles.**

Execution:

1. Place a call on console A on the test group.
   - ☐ Verify that console B can hear console A.
2. Open the Symphony Configuration Utility for console B in the 'General' section add the ID for console A to the 'Cross Mute' list.
3. Select 'Apply' to save the changes.
4. Place a call on console A on the test group
   - ☐ Verify the call can't be heard at console B.
5. Restore the desired cross mute setup.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

16.10 Call History

Purpose: **Confirms a history of calls processed at the console.**

Expected Results: **The history is accessible and valid.**

Setup: **This test compares programmed module call activity to the history scroll lists. Utility page, dispatch menu will be selected. Select either the "Select History" or "Unselect History".**

Execution:

1. Press the 'Scroll Up' and 'Scroll Down' buttons to scroll through the Unselect call history list.
   - Compare these calls with known activity.
2. Press the 'Scroll Up' and 'Scroll Down' buttons to scroll through the selected call history list.
   - Compare these calls with known activity.
3. Press the 'Esc' button to exit the history scroll mode.
4. To monitor call history on a single group, use the 'module history' button on the 'module modify' menu.
5. Use the 'scroll up' and 'scroll down' buttons to scroll through the calls for the picked module.
   - Compare these calls with known activity.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

16.11 Group Call

Purpose: **Confirms the scan function which allows a smartphone to hear audio on selected talk-groups other than the current talk-group.**

Expected Results: **Selected talk-group call audio is heard.**

Setup: **Set smart-phones 1, 2, & 3 to (Group A) per test group structure. Make sure Scan is turned OFF.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
BeOn_202	998202	TG64151 P25	64151
BeOn_203	998203	TG64151 P25	64151
BeOn_204	998204	TG64151 P25	64151

Execution:

1. PTT on BeOn_202 and talk.
   - ☐ The transmit (TX) indicators should turn on at BeOn_202.
   - ☐ Audio should be heard in BeOn_203, and BeOn_204.
   - ☐ The ID of BeOn_202 should be seen at BeOn_203, and BeOn_204.
2. Set BeOn_204 to TG64152 P25. PTT on BeOn_202 and talk.
   - ☐ The transmit (TX) indicators should turn on at BeOn_202.
   - ☐ Audio should be heard in BeOn_203 only.
   - ☐ The ID of BeOn_202 should be seen at BeOn_203 only.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

16.12 Individual (Private) Call

Purpose: **Confirms individual calls can be initiated using BeOn enabled smartphones.**

Expected Results: **Individual calls are confirmed.**

Setup:

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
BeOn_202	998202	TG64151 P25	64151
BeOn_203	998203	TG64151 P25	64151
BeOn_204	998204	TG64151 P25	64151

Execution:

1. Using the BeOn_202, select the pre-stored ID of BeOn_203 or enter the BeOn_203 ID directly from the keypad, and PTT smartphone 1.

   - ☐ Verify that BeOn_203 receives the call and displays the ID of smartphone 1.
   - ☐ Verify that BeOn_204 remains idle.

2. Release the PTT on BeOn_202 and immediately PTT on BeOn_203.

   - ☐ Verify that BeOn_202 receives the call and displays the ID of BeOn_203.
   - ☐ Verify BeOn_204 remains idle.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

16.13 Group Scan

Purpose: **Confirms the scan function which allows a smartphone to hear audio on selected talk-groups other than the current talk-group.**

Expected Results: **Selected talk-group call audio is heard.**

Setup: **BeOn_202 set up with TG64151 P25 and TG64152 P25 in the scan list, TG64151 P25 selected, and group scan initially disabled.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
BeOn_202	998202	TG64151 P25	64151
BeOn_203	998203	TG64151 P25	64151
BeOn_204	998204	TG64151 P25	64151

Execution:

1. Place a call from BeOn_203 on TG64151 P25.
   - ☐ Verify the call is received and audio is heard on BeOn_202.
2. Place a call from BeOn_203 on TG64152 P25.
   - ☐ Verify the call is not received by BeOn_202.
3. Enable group scan on BeOn_202.
4. Place another call from BeOn_203 on TG64152 P25.
   - ☐ Verify that the call is now received, and audio is heard on BeOn_202.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

16.14 Emergency Group Call

Purpose: **Confirms an emergency can be declared, recognized and cleared by a smartphone.**

Expected Results: **The emergency is declared, recognized and cleared.**

Setup:

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
BeOn_202	998202	TG64151 P25	64151
BeOn_203	998203	TG64152 P25	64152
BeOn_204	998204	TG64153 P25	64153

Execution:

1. Press the Emergency call button on BeOn_204 and then PTT BeOn_204.

   - ☐ Verify that BeOn_204 indicates the “TX EMER” declaration and that it reverts to the home group.

   - ☐ Verify that BeOn_202 and BeOn_203 indicate a “RX EMER” and hear audio on the emergency home group.

2. Clear the emergency with the Supervisor smartphone (BeOn_202).

   - ☐ Verify the emergency clears in the smartphones.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

17. BEON FEATURES

Purpose: **These will test the BeOn features.**

Expected Results: **This test will demonstrate that BeOn works as designed.**

Setup: **This test will show that the BeOn system allows a smartphone to communicate with the radio system.**

17.1 Transmit Grant Tone

Purpose: **This test will demonstrate the grant tone on BeOn.**

Expected Results: **When the smartphone PTTs on the BeOn app it will play a grant tone.**

Setup: **Grant tone (Ready to Talk tone) enabled in smartphone radio personality.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
BeOn_202	998202	TG64151 P25	64151
BeOn_203	998203	TG64151 P25	64151
BeOn_204	998204	TG64151 P25	64151

Execution:

1. Press PTT button on smartphone with valid group selected.

   - Verify grant tone is heard at smartphone when working channel access is granted.

Note: If the call is queued, the grant tone will be delayed until the call is assigned a working channel.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

17.2 Group Call

Purpose: **Confirms the scan function which allows a smartphone to hear audio on selected talk-groups other than the current talk-group.**

Expected Results: **Selected talk-group call audio is heard.**

Setup: **Set smart-phones 1, 2, & 3 to (Group A) per test group structure. Make sure Scan is turned OFF.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
BeOn_202	998202	TG64151 P25	64151
BeOn_203	998203	TG64151 P25	64151
BeOn_204	998204	TG64151 P25	64151

Execution:

3. PTT on BeOn_202 and talk.
   - ☐ The transmit (TX) indicators should turn on at BeOn_202.
   - ☐ Audio should be heard in BeOn_203, and BeOn_204.
   - ☐ The ID of BeOn_202 should be seen at BeOn_203, and BeOn_204.
4. Set BeOn_204 to TG64152 P25. PTT on BeOn_202 and talk.
   - ☐ The transmit (TX) indicators should turn on at BeOn_202.
   - ☐ Audio should be heard in BeOn_203 only.
   - ☐ The ID of BeOn_202 should be seen at BeOn_203 only.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

17.3 Individual (Private) Call

Purpose: **Confirms individual calls can be initiated using BeOn enabled smartphones.**

Expected Results: **Individual calls are confirmed.**

Setup:

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
BeOn_202	998202	TG64151 P25	64151
BeOn_203	998203	TG64151 P25	64151
BeOn_204	998204	TG64151 P25	64151

Execution:

3. Using the BeOn_202, select the pre-stored ID of BeOn_203 or enter the BeOn_203 ID directly from the keypad, and PTT smartphone 1.

   - ☐ Verify that BeOn_203 receives the call and displays the ID of smartphone 1.
   - ☐ Verify that BeOn_204 remains idle.

4. Release the PTT on BeOn_202 and immediately PTT on BeOn_203.

   - ☐ Verify that BeOn_202 receives the call and displays the ID of BeOn_203.
   - ☐ Verify BeOn_204 remains idle.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

17.4 Group Scan

Purpose: **Confirms the scan function which allows a smartphone to hear audio on selected talk-groups other than the current talk-group.**

Expected Results: **Selected talk-group call audio is heard.**

Setup: **BeOn_202 set up with TG64151 P25 and TG64152 P25 in the scan list, TG64151 P25 selected, and group scan initially disabled.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
BeOn_202	998202	TG64151 P25	64151
BeOn_203	998203	TG64151 P25	64151
BeOn_204	998204	TG64151 P25	64151

Execution:

5. Place a call from BeOn_203 on TG64151 P25.
   - ☐ Verify the call is received and audio is heard on BeOn_202.
6. Place a call from BeOn_203 on TG64152 P25.
   - ☐ Verify the call is not received by BeOn_202.
7. Enable group scan on BeOn_202.
8. Place another call from BeOn_203 on TG64152 P25.
   - ☐ Verify that the call is now received, and audio is heard on BeOn_202.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

17.5 Emergency Group Call

Purpose: **Confirms an emergency can be declared, recognized and cleared by a smartphone.**

Expected Results: **The emergency is declared, recognized and cleared.**

Setup:

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
BeOn_202	998202	TG64151 P25	64151
BeOn_203	998203	TG64152 P25	64152
BeOn_204	998204	TG64153 P25	64153

Execution:

3. Press the Emergency call button on BeOn_204 and then PTT BeOn_204.

   - ☐ Verify that BeOn_204 indicates the “TX EMER” declaration and that it reverts to the home group.

   - ☐ Verify that BeOn_202 and BeOn_203 indicate a “RX EMER” and hear audio on the emergency home group.

4. Clear the emergency with the Supervisor smartphone (BeOn_202).

   - ☐ Verify the emergency clears in the smartphones.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

18. TRUNKED LOGGING RECORDER

18.1 Group Call

Purpose: **Confirms group call audio is captured, recorded and accessible on the logging recorder**

Expected Results: **Calls are captured, recorded and accessible.**

Setup:

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64051 P25	64051
Radio 2	998002	TG64051 P25	64051
Radio 3	998003	TG64051 P25	64051

1. PTT radio 1 and talk.

   - ☐ Audio should be heard on radio 2. Note the Start time of the call and the approximate duration.

2. Retrieve the call from the Logging Recorder.

   - ☐ Verify the Caller, Callee, Start Time, and duration.
   - ☐ The Caller should be the LID for Radio 1 and the Callee should be the GID for 64051. Verification should include the LID/GID and its Alias as defined by the UAS.
   - ☐ Verify that the call is identified as a Group Call.

3. Playback the audio

   - ☐ Confirm that the playback audio is all recorded and intelligible.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

18.2 Emergency Group Call

Purpose: **Confirms emergency group call audio is captured, recorded and accessible on the logging recorder**

Expected Results: **Calls are captured, recorded and accessible.**

Setup:

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64051 P25	64051
Radio 2	998002	TG64051 P25	64051
Radio 3	998003	TG64051 P25	64051

Execution:

1. Press the Emergency call button on radio 2. Talk during the Hot Mic transmit time.

2. Clear the emergency with the radio 1.

3. Retrieve the call from the Logging Recorder.
   - ☐ Verify the Caller
   - ☐ Verify the Callee
   - ☐ Verify the start time
   - ☐ Verify the duration
   - ☐ The Caller should be the LID for Radio 2 and the Callee should be the GID for the Home Group.
   - ☐ Verification should include the LID/GID and its Alias as defined by the UAS.
   - ☐ Verify that the call is identified as an Emergency.
   - ☐ Playback the audio and confirm that it is all recorded and intelligible.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

19. P25 SIMULCAST BYPASS OPERATION

Program the MASTR V modules (both Control Points and Transmit Sites) to the Final Configuration. Refer to the installation manual for the guide to setting TX Traffic Controllers / CP Traffic Controllers personality parameters.

Verify the BYPASS plan has been reviewed and approved by customer representative. This procedure makes assumptions on bypass sites before implementation and test of the System. After WMS/Panther signal strength data collection, final decision will be made on the actual bypass "ON" and "OFF" sites.

Prepare a minimum of two terminal radios programmed to operate on the active BYPASS site and the main simulcast system.

19.1 Site OFF - Final Configuration

Purpose:	**Confirm sites configured to be in the "OFF" condition during BYPASS are in the expected BYPASS mode.**
Expected Results:	**The "OFF" site traffic controllers have no control channel.**
Setup:	**Sites intended to be "OFF" in event of BYPASS must have all channels set to disabled (unchecked in Device Manager, TC personality).**

Execution:

1. At one of the sites designated as an "off" site, create a condition to force BYPASS by disconnecting the router to MPLS connection. All other sites will have the HPAs disabled locally.

   - ☐ Verify transmit site is in BYPASS mode.
   - ☐ The Traffic Controller module display indicates "TC" instead of "TR". Note: TC= Working Traffic Channel, standalone mode, TR=Working Channel, simulcast mode, and Control Channel, simulcast mode is indicated by the transmit LED indicator.

2. Observe the repeater (station) Traffic Controller modules.

   - ☐ Verify there is no active control channel.
   - ☐ Verify no stations are keyed or producing RF power.

3. Restore the site to normal by returning the site to simulcast mode by reconnecting the router to MPLS connection.

   - Verify transmit site is in normal simulcast mode. The Traffic Controller modules will indicate “TR(n)”, where n is the channel number.

4. Repeat steps 1-3 for the remaining “OFF” bypass sites in the simulcast system under test.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

19.2 Site ON (trunking) - Final Configuration

Purpose: **Confirm sites configured to be in the "ON" condition during BYPASS are in the expected BYPASS mode.**

Expected Results: **The "ON" site traffic controllers have a control channel and calls to terminal radios can be initiated.**

Setup:

Execution:

1. Create a condition to force BYPASS by disconnecting the router to MPLS connection.
   - ☐ Verify transmit site is in BYPASS mode. BYPS LED on Baseband module and the Traffic Controller module display indicates either "TC" or "CC" instead of "TR.
   - ☐ Observe the stations/repeater Traffic Controller modules. Verify there is an active control channel on one of the Traffic Controller modules. The remaining repeater/stations Traffic Controller modules will indicate "TC".
   - ☐ Verify the station appearing as control channel is keyed, producing RF power and modulated with control channel data.
   - ☐ Verify a terminal radio set to the system programmed for the site in BYPASS with the correct site ID recognizes the site's control channel data.

2. Key the terminal radio on a group call.
   - ☐ Verify a working channel assignment is made within the channel group allowed in the personality.
   - ☐ Verify the call is heard on a second terminal radio set to the active BYPASS system.

3. Restore the site to simulcast mode by reconnecting the router to MPLS connection.
   - ☐ Verify transmit site is in normal simulcast mode. Traffic Controller modules indicate "TR(n).

4. Repeat steps 1-3 for the remaining "ON" bypass sites in the simulcast system under test.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

19.3 Control Point Trunking Reset Control

Purpose: **A properly set up Simulcast BYPASS system will disable CP Traffic Controller modules associated with active channels at a TX site operating in BYPASS. This keeps the remaining sites operating in Simulcast mode from being assigned to channels expected to be active at the site in BYPASS. Sites programmed to be OFF in BYPASS will not require any Traffic Controller modules to be held OFF.**

Expected Results: **This test will verify that the Control Point Traffic Controller modules will be held OFF corresponding to the active channels at a site as a result of the TX site being in BYPASS.**

Setup:

Execution:

1. Force a TX site that will become active into BYPASS by disconnecting the router to MPLS connection.

   - ☐ Verify TX site is in BYPASS mode.
   - ☐ Verify transmit site is in BYPASS mode. Traffic Controller module display indicates either “TC” or “CC” instead of “TR”.
   - ☐ Verify the CP Traffic Controller modules on the channels intended to be OFF are held OFF.

2. Observe the RNM screen for the simulcast system.

   - ☐ Verify the channels intended to be OFF at the Control Point are reported as OFF (RED).

3. Restore the site to simulcast mode by reconnecting the router to MPLS connection.

   - ☐ Verify the TX site Traffic Controller modules revert to normal Simulcast.
   - ☐ Verify the CP Traffic Controller modules associated with the site in BYPASS are returned to normal.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

19.4 Bypass – Site Minimum Channels

Purpose: **Confirm a site enters bypass when active channels fall below site minimum channels setting.**

Expected Results: **The site enters bypass mode.**

Setup: **Sites are configured with cluster minimum channels set to 6 and site minimum channels to 7.**

Bypass Plan: TR Site 1 Ch 3,4,5; TR Site 2 Ch 6,7,8; TR site 3 Ch 9,10,11 TR Sites 4 and 5 dark

Note **Settings and bypass plan can be customer final settings; execution will have to adjust to accommodate those settings.**

Execution:

1. At TR site 1 disable channels 8 - 11 using the TX disable switch on the PA (only channels 1-7 are still functioning).
   - ☐ Verify system and site still functioning in simulcast; the disabled channels 8-11 are in alarm state at the control point site.
   - ☐ At TR site 1 the Traffic Controller modules displays still indicates “TR” not “TC” or “CC”. Note: TC= Working Traffic Channel, standalone mode, TR=Working Channel, simulcast mode, and Control Channel, simulcast mode is indicated by the transmit LED indicator.

2. At the same site disable channel 7 using the TX disable switch on the PA.
   - ☐ Verify system is still functioning in simulcast. Control Point ch 3,4 and 5 in alarm state.
   - ☐ Verify TR site 1 is in bypass. The Traffic Controller module display indicates “TC” instead of “TR”. All channels status indicates alarm. Note: TC= Working Traffic Channel, standalone mode, TR=Working Channel, simulcast mode, and Control Channel, simulcast mode is indicated by the transmit LED indicator always on.

3. At the same site restore all channels back to service (enable the PA using the TX disable switch on the PA).
   - ☐ Verify transmit site 1 is in normal simulcast mode. The Traffic Controller modules will indicate “TR(n)”, where n is the channel number.
   - ☐ Verify all channels are in service at the control point.

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

19.5 Bypass – Cluster Minimum Channels – TR site failures

Purpose: **Confirm all sites enter bypass when available channels fall below the cluster minimum channels setting. Depending upon the system size, bypass plan and which channels have been failed a subset of sites may subsequently come out of bypass and operate as a cluster before any channels are restored to service.**

Expected Results: All site in the system enter bypass mode.

Setup: **Sites are configured with cluster minimum channels set to 6 and site minimum channels set to 7 (these settings are normally lower; they are set high to simplify testing).**

Execution:

1. At TR site 1 disable channels 9, 10 and 11 using the TX disable switch on the PA (8 channels are still functioning.

   - ☐ Verify system and site still functioning in simulcast.

   - ☐ The Traffic Controller module displays still indicates “TR” not “TC” or “CC”. Note: TC= Working Traffic Channel, standalone mode, TR=Working Channel, simulcast mode, and Control Channel, simulcast mode is indicated by the transmit LED indicator.

2. At TR site 3 disable channels 6, 7 and 8 using the TX disable switch on the PA (5 channels are still functioning).

   - ☐ Verify All sites have entered bypass (the TCs display “TC” and “CC”, not “TR” and every channel status indicates failed at every site.

3. Enable the PAs at the sites using the TX disable switches.

   - ☐ Verify the system recovers to simulcast mode with all transmit sites in normal simulcast mode. The Traffic Controller modules will indicate “TR(n)”, where n is the channel number.

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

19.6 Site ON (trunking) - Enhanced Bypass Final Configuration

Purpose: **Confirm sites configured to be in the "ON" condition during BYPASS are in the expected BYPASS mode and can connect to VNIC.**

Expected Results: **The "ON" site traffic controllers have a control channel and calls between terminal radios and dispatch can be made.**

Setup:

Execution:

1. Create a condition to force BYPASS that does not disrupt network connectivity by logging into both GPS receivers and configuring their notifications to set the major alarm threshold to minimum satellites 12 and duration below threshold 5 seconds. This will cause the GPS receivers to set a major alarm after 5 seconds.

2. Configure Notifications from Spectracom GPS Receivers

Navigate to: **Management → Notifications**

2. In the **Events** window pane, click the **GPS** tab.
3. Set the Major Alarm Threshold as follows:
   a. Minimum Satellites: **12**
   b. Duration Below Threshold: **5**
4. Click: **[Submit]**

3. Verify transmit site is in BYPASS mode. The Traffic Controller module display indicates either “TC” or “CC” instead of “TR”.

☐ Observe the stations/repeater Traffic Controller modules. Verify there is an active control channel on one of the Traffic Controller modules. The remaining repeater/stations Traffic Controller modules will indicate “TC”.

☐ Verify the station appearing as control channel is keyed, producing RF power and modulated with control channel data.

☐ Verify a terminal radio set to the system programmed for the site in BYPASS with the correct site ID recognizes the site’s control channel data.

4. Key the terminal radio on a group call.

☐ Verify a working channel assignment is made within the channel group allowed in the personality.

5. Restore the site to simulcast mode by restoring the GPS major alarm notification threshold to minimum satellites = 1 and duration = 345600 for both GPS receivers.

☐ Verify transmit site is in normal simulcast mode. Traffic Controller modules indicate "TR(n).

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

20. VIDA INTER-OPERABILITY GATEWAY TEST

20.1 Local Interoperability

Purpose: **The purpose of this test is to verify correct functionality of the Interoperability Gateway.**

Expected Results: **Verify that the**

Setup: **The Interoperability Gateway connects via 4-wire audio connections in its Universal Access Cards(UAC) cards to interoperability radio units (mobile or desktop). The Gateway also connects to a router and the Network Switching Center (NSC) to provide call functionality across the network.**

Execution:

1. Select Inter-op group 1 on the radio.
2. Initiate a call from the radio to group 1
   - ☐ Verify that audio is heard on inter-op group 1 radio.
3. Initiate a call from the inter-op group 1 radio to group 1
   - ☐ Verify that audio is heard on the radio.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

21. INFORMATION ASSURANCE TESTING

21.1 Active Directory

Purpose: **The purpose of this test is to view the GPO structure on an Active Directory server.**

Expected Results: **The GPO structure is valid.**

Setup: **None**

Execution:

1. Log into an Active Directory Server.
2. Open AD Users/Groups
   - ☐ Validate that the computers have been added to AD.
3. Open Group Policies Management
   - ☐ Verify VIDA GPO Structure

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

21.2 Cisco Prime

Purpose: **This test will test the Cisco Prime.**

Expected Results: **This test will verify that the Cisco Prime is communicating with the necessary devices.**

Setup: **The purpose of this test is to verify that Cisco Prime is configured and is capable of accessing the Cisco devices on the network.**

Execution:

1. Use Internet Explorer on a client PC to browse to CiscoPrime
2. Select ‘RME’
3. Expand ‘Devices’
4. Select ‘Inventory’
5. Select ‘View Inventory Connection Status’
6. Select the number on Inventory Collected
7. Select a device
8. Expand ‘All Devices’
9. Select a device
10. Select ‘Cisco View’
11. Select a port
12. Select ‘Configure’
13. Click on a Device
    - View ‘Configuration’
14. Close windows and log out

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

21.3 ePolicy Orchestrator

Purpose: **The purpose of this test is to verify that ePolicy Orchestrator is communicating with its end devices and that it will report actions that have been taken by McAfee Antivirus on a remote computer.**

Expected Results: **ePolicy Orchestrator is accessible and displays valid reporting.**

Setup: **None**

Execution:

1. Use Internet Explorer on a client PC to navigate to the McAfee E-Policy Orchestrator server
2. Log in using proper credentials
3. Go to the Main Screen
   - Verify all servers have been added to policies.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

21.4 Backup

Purpose: **The purpose of this test is to verify that the Unitrends server has a schedule for performing backups of network computers and that it can display the backup status of those computers**

Expected Results: **The test will verify that the backup is configured.**

Setup: **None**

Execution:

1. Use Internet Explorer on a client PC to navigate to the Unitrends Backup UAC
2. Log in using proper log in credentials
3. Go to the Main Screen
   - Verify that devices are visible, and backups are configured.

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

21.5 Intrusion Detection

Purpose: **The purpose of this test is to verify that the Sourcefire Defense Center is communicating with its IDS sensors at remote sites across the network.**

Expected Results: **Sourcefire Defense Center is communicating with its IDS sensors.**

Setup: **None**

Execution:

1. Use Internet Explorer on a client PC to navigate to the Sourcefire Defense Center
2. Log in using proper credentials
3. Go to Defense Center Dashboard
4. Click Operations. Go to Sensors
   - ☐ Verify that all Sensors are visible.

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

21.6 SysLog

Purpose: **The purpose of this test is to verify that network devices are sending SysLog messages to the LogLogic server.**

Expected Results: **This test will verify that the clients are reporting to the Log Logic.**

Setup: **None**

Execution:

1. Use Internet Explorer on a client PC to navigate to the LogLogic Syslog web page
2. Log in using proper log in credentials
3. Go to LogLogic System Status Dashboard
4. Click Log Source Status
   - ☐ Verify current devices are reporting.

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

21.7 SUMS

Purpose: **To demonstrate that the SUMS server is communicating with the remote client.**

Expected Results: **This test will verify that the SUMS server is communicating with the remote clients and that the remote clients are updated.**

Setup: **None**

Execution:

1. Log into the SUMS server and launch the 'IBM Endpoint Manager Console' and log into the console with the SUMS administers user.

2. Expand 'Sites' 'Custom Sites' 'Vida' and select 'Subscribed Computers'

   - ☐ Verify that each Computer is listed, in the Subscribed Computers window
   - ☐ Check to make sure that each computer has reported to the SUMS server with in the last 30 minutes by checking the 'Last Report Time' column.
   - ☐ To check to make sure all the Subscriber Computers are update by selecting the 'Baseline' in the left-hand window.
   - ☐ Make sure the 'Baseline' window is empty or all computer in the window are gray.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

22. ACTION ITEMS

Test #	Page #	Action/Issue
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23. ACRONYMS AND DEFINITIONS

AD	Active Directory
AES	Advanced Encryption Standard
Confirmed Call	A confirmed call is a special type of call where the call is queued until all sites have resources available, or until the confirmed call timer expires (configurable, typically one or two seconds)
DM	Device Manager
DNS	Domain Name Server
FDMA	Frequency Division Multiple Access
FIPS 140-2	Federal Information Processing Standard, publication 140-2. The title is “Security Requirements for Cryptographic Modules”
FM	Frequency Modulation
HA	High Availability
IFW	Internet Firewall
Individual Call	An individual call is a private call between one user and another. It can be between two radios, or between one radio and a dispatch console
IP	Internet Protocol
IPS	Intrusion Prevention System
ISSI	Inter Sub System Interface. This is the interface between WACNs, in the Harris architecture an interface between a VNIC and a foreign P25 system
KEK	Key Encryption Key
KID	16-bit Encryption Key ID
KMF	Key Management Facility
LED	Light Emitting Diode
MASTR V	A Harris base station product

MDIS	Mobile Data Intermediate System, a Harris data switch used in Harris' OpenSky Architecture
MES	Mobile End System, a subscriber radio
MME	Miniature Mobility Exchange, which consists of Harris software running on a SitePro card at the base site. The MME runs the SNDCP layer of the data protocol and is the equivalent of the P25 RFG (RF Gateway)
NSC	Network Switching Center
NSS	Network Switching Server
NWS	Network Sentry
OTAP	Over The Air Programming
OTAR	Over The Air Rekeying
P25	Project 25, a suite of standards for digital radio communications, developed by the Association of Public Safety Communications Officials (APCO) under the TIA TR-8 engineering committee, and published as the TIA-102 set of documents
Priority Talkgroup	The priority talkgroup selected on the subscriber device. Usually this is the talkgroup that the radio will transmit on when the user presses PTT
ProFile	A Harris product used for configuring radios over the P25 radio channel
ProScan	A Harris software algorithm used for radio roaming
PSAP	Public Safety Access Point, usually an agency dispatch center
PSTN	Public Switched Telephone Network
PTT	Push To Talk
RAR	Regional Access Router
RF	Radio Frequency
RFW	Regional Firewall
RMS	Regional Management Server

RNM	Regional Network Manager
RS	Reed Solomon, a form of error detection and correction coding
RSM	Regional Site Manager, a server which runs the RSM, Activity Warehouse and Device Manager applications
SACCH	Slow Associated Control Channel (Phase 2)
SAN	Storage Area Network
Sourcefire DFC	Defense Center
SS	Status Symbol (a two bit field in the control channel, used for channel access control signaling)
SSL	Secure Socket Layers
SSH	Secure Shell is a program to log into another computer over a network, to execute commands in a remote machine, and to move files from one machine to another. It provides strong authentication and secure communications over insecure channels. It is a replacement for rlogin, rsh, rcp, and rdist.
SUMS	Security Update Management Service (a Harris product)
System ID	The System ID is a 12-bit field of the network address which identifies the VNIC
TAC	Technical Assistance Center, a Harris service
TACACS	Terminal Access Controller Access Control System
TDMA	Time Division Multiple Access
TDU	Terminator Data Unit, used to terminate a voice message
TEK	Traffic Encryption Key
Telnet	A terminal emulation program for TCP/IP networks such as the Internet. The Telnet program runs on your computer and connects your PC to a server on the network.
TGID	Talkgroup ID (16-bit, equivalent to GID). The P25 documents usually use GID but some of the older documents use TGID
Traffic Controller	Software entity which resides in a base station at the site and generates the P25 control channel

TRC	Tone Remote Control
TSBK	Trunking Signaling Block (a 196-bit field in the control channel)
Tx	Transmit
UAC	Unified Audio Card
UAS	Unified Administration Server
UID	Unified ID. This is a Harris specific acronym referring to an ID composed of the System ID and SID. The UID is a ten-digit number in the form 604-415-4003, representing region, agency, and individual
Unitrends	Enterprise backup for VIDA networks
UPS	Uninterrupted Power Supply
VAS	VIDA Application Server
VCE	VIDA Console Exchange
VCH	Voice Channel (Phase 2)
VDOC	Voice and Data on Control (the control channel can assign itself as a traffic channel)
VIDA	Voice, Interoperability, Data, Access (a Harris system product)
VME	Versa Module Eurocard (IEEE 1014)
VNIC	Voice Network Interface Controller, the Harris voice switch
VTI	VIDA Telephone Interconnect
WACN	Wide Area Communication Network (20-bit network ID, part of SUID). This is a customer network which can include many VNICs
Zeroize	A P25 control channel command which causes the mobile radio to erase its encryption keys (but then requires manual loading to restore encryption keys)

24. UAS DATA BASE

24.1 Subscriber Units

Region Id	Agency Id	P25 IP Address	OpenSky IP Address	Description	Electronic Serial Number	Protocol Mask	Status	Sub Type	Assigned End User	Algorithm Support
10	998		10.128.111.19	OS_Radio_19	0	OpenSky	Enabled Unit			
10	998		10.128.111.20	OS_Radio_20	0	OpenSky	Enabled Unit			
10	998		10.128.111.2	OS_Radio_02	0	OpenSky	Enabled Unit			
10	998		10.128.111.3	OS_Radio_03	0	OpenSky	Enabled Unit			
10	998		10.128.111.4	OS_Radio_04	0	OpenSky	Enabled Unit			
10	998		10.128.111.5	OS_Radio_05	0	OpenSky	Enabled Unit			
10	998		10.128.111.6	OS_Radio_06	0	OpenSky	Enabled Unit			
10	998		10.128.111.7	OS_Radio_07	0	OpenSky	Enabled Unit			
10	998		10.128.111.8	OS_Radio_08	0	OpenSky	Enabled Unit			
10	998		10.128.111.9	OS_Radio_09	0	OpenSky	Enabled Unit			
10	998		10.128.111.10	OS_Radio_10	0	OpenSky	Enabled Unit			
10	998		10.128.111.11	OS_Radio_11	0	OpenSky	Enabled Unit			

10	998		10.128.111.12	OS_Radio_12	0	OpenSky	Enabled Unit			
10	998		10.128.111.13	OS_Radio_13	0	OpenSky	Enabled Unit			
10	998		10.128.111.14	OS_Radio_14	0	OpenSky	Enabled Unit			
10	998		10.128.111.15	OS_Radio_15	0	OpenSky	Enabled Unit			
10	998		10.128.111.16	OS_Radio_16	0	OpenSky	Enabled Unit			
10	998		10.128.111.1	OS_Radio_1	0	OpenSky	Enabled Unit			
10	998		10.128.111.17	OS_Radio_17	0	OpenSky	Enabled Unit			
10	998		10.128.111.18	OS_Radio_18	0	OpenSky	Enabled Unit			
10	998	10.128.79.9		Radio9	109980009	P25	Enabled Unit	Harris XG-75 Portable	010:998:0009	AES
10	998	10.128.79.10		Radio10	109980010	P25	Enabled Unit	Harris XG-75 Portable	010:998:0010	AES
10	998	10.128.79.8		Radio8	109980008	P25	Enabled Unit	Harris XG-75 Portable	010:998:0008	AES
10	998	10.128.53.1		Console9101	109989101	P25	Enabled Unit	Maestro Console	010:998:9101	AES
10	998	10.128.53.2		Console 9102	109989102	P25	Enabled Unit	Maestro Console	010:998:9102	Both
10	998	10.128.79.1		Radio1	109980001	P25	Enabled Unit	Harris P5400	010:998:0001	AES
10	998	10.128.79.2		Radio2	109980002	P25	Enabled Unit	Harris P5400	010:998:0002	AES
10	998	10.128.79.3		Radio3	109980003	P25	Enabled Unit	Harris XG-75 Portable	010:998:0003	AES
10	998	10.128.79.4		Radio4	109980004	P25	Enabled Unit	Harris XG-75 Portable	010:998:0004	AES

10	998	10.128.79.5	Radio5	109980005	P25	Enabled Unit	Harris XG-75 Portable	010:998:0005	AES
10	998	10.128.79.6	Radio6	109980006	P25	Enabled Unit	Harris XG-75 Portable	010:998:0006	AES
10	998	10.128.79.7	Radio7	109980007	P25	Enabled Unit	Harris XG-75 Portable	010:998:0007	AES
10	998	10.128.79.11	Radio11	109980011	P25	Enabled Unit	Harris UNITY XG-100P	010:998:0011	AES
10	998	10.128.79.12	Radio12	109980012	P25	Enabled Unit	Harris UNITY XG-100P	010:998:0012	AES
10	998	10.128.1.161	s0u1xcda	0	P25	Enabled Unit		010:998:9001	AES
10	998	10.128.1.162	s0u1xcdb	0	P25	Enabled Unit		010:998:9005	AES

24.2 Voice End Users

Region Id	Agency Id	User Id	Name	Description	Personality	User Privilege	Message Trunked ICall	Enable P25 AES OTAR	Manually-Keyed	Preferred Vocoder	Transcoding Allowed Flag
10	998	010:998:9921	VAQ-SS22	SiteSim VAQ User22	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0210	BeOn_210	BeOn_210	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9012	XCD_9012	XCD_9012	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9014	XCD_9014	XCD_9014	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:7005	VTI_7005	VTI_7005	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9909	VAQ-SS10	SiteSim VAQ User10	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9926	VAQ-SS27	SiteSim VAQ User27	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9905	VAQ-SS06	SiteSim VAQ User06	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0202	BeOn_202	BeOn_202	BeOn_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9925	VAQ-SS26	SiteSim VAQ User26	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0015	U9980015	U9980015	OS_Pers	998_10_default	TRUE	FALSE	FALSE	OpenSky 2400 AMBE+2	TRUE

10	998	010:998:00 16	U9980016	U9980016	OS_Pers	998_10_default	TRUE	FALSE	FALSE	OpenSky 2400 AMBE+2	TRUE
10	998	010:998:99 15	VAQ-SS16	SiteSim VAQ User16	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:99 03	VAQ-SS04	SiteSim VAQ User04	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:99 18	VAQ-SS19	SiteSim VAQ User19	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:99 04	VAQ-SS05	SiteSim VAQ User05	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:99 20	VAQ-SS21	SiteSim VAQ User21	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:99 07	VAQ-SS08	SiteSim VAQ User08	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:00 03	U9980003	U9980003	Pers1	998_10_default	TRUE	TRUE	FALSE	P25 Full Rate	TRUE
10	998	010:998:99 19	VAQ-SS20	SiteSim VAQ User20	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:99 11	VAQ-SS12	SiteSim VAQ User12	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:00 17	U9980017	U9980017	OS_Pers	998_10_default	TRUE	FALSE	FALSE	OpenSky 2400 AMBE+2	TRUE
10	998	010:998:00 08	U9980008	U9980008	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:99 01	VAQ-SS02	SiteSim VAQ User02	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE

10	998	010:998:0208	BeOn_208	BeOn_208	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9927	VAQ-SS28	SiteSim VAQ User28	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:7009	VTI_7009	VTI_7009	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9004	XCD_9004	XCD_9004	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9006	XCD_9006	XCD_9006	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9007	XCD_9007	XCD_9007	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0005	U9980005	U9980005	Pers1	998_10_default	TRUE	TRUE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9002	XCD_9002	XCD_9002	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:7002	VTI_7002	VTI_7002	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9906	VAQ-SS07	SiteSim VAQ User07	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9922	VAQ-SS23	SiteSim VAQ User23	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:7001	VTI_7001	VTI_7001	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0207	BeOn_207	BeOn_207	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE

10	998	010:998:9010	XCD_9010	XCD_9010	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9929	VAQ-SS30	SiteSim VAQ User30	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:7004	VTI_7004	VTI_7004	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9018	XCD_9018	XCD_9018	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0013	U9980013	U9980013	OS_Pers	998_10_default	TRUE	FALSE	FALSE	OpenSky 2400 AMBE+2	TRUE
10	998	010:998:7006	VTI_7006	VTI_7006	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9016	XCD_9016	XCD_9016	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9009	XCD_9009	XCD_9009	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:6005	Site5VirtualUser	Site5VirtualUser	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0006	U9980006	U9980006	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9011	XCD_9011	XCD_9011	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9013	XCD_9013	XCD_9013	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0007	U9980007	U9980007	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE

10	998	010:998:0206	BeOn_206	BeOn_206	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9019	XCD_9019	XCD_9019	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9917	VAQ-SS18	SiteSim VAQ User18	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9908	VAQ-SS09	SiteSim VAQ User09	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0004	U9980004	U9980004	Pers1	998_10_default	TRUE	TRUE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9005	XCD_9005	XCD_9005	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9900	VAQ-SS01	SiteSim VAQ User01	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9003	XCD_9003	XCD_9003	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9928	VAQ-SS29	SiteSim VAQ User29	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9923	VAQ-SS24	SiteSim VAQ User24	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0011	U9980011	U9980011	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0010	U9980010	U9980010	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9916	VAQ-SS17	SiteSim VAQ User17	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE

10	998	010:998:9008	XCD_9008	XCD_9008	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9017	XCD_9017	XCD_9017	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0205	BeOn_205	BeOn_205	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0201	BeOn_201	BeOn_201	BeOn_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9001	XCD_9001	XCD_9001	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0209	BeOn_209	BeOn_209	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0204	BeOn_204	BeOn_204	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9914	VAQ-SS15	SiteSim VAQ User15	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9103	U9980003	U9980003	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:7007	VTI_7007	VTI_7007	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:7010	VTI_7010	VTI_7010	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0009	U9980009	U9980009	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9924	VAQ-SS25	SiteSim VAQ User25	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE

10	998	010:998:7008	VTI_7008	VTI_7008	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0002	U9980002	U9980002	Pers1	998_10_default	TRUE	TRUE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0012	U9980012	U9980012	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0014	U9980014	U9980014	OS_Pers	998_10_default	TRUE	FALSE	FALSE	OpenSky 2400 AMBE+2	TRUE
10	998	010:998:9912	VAQ-SS13	SiteSim VAQ User13	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:6003	Site3VirtualUser	Site3VirtualUser	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9902	VAQ-SS03	SiteSim VAQ User03	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0203	BeOn_203	BeOn_203	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9015	XCD_9015	XCD_9015	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9913	VAQ-SS14	SiteSim VAQ User14	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:7003	VTI_7003	VTI_7003	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9910	VAQ-SS11	SiteSim VAQ User11	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:6004	Site4VirtualUser	Site4VirtualUser	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE

10	998	010:998:9101	Cons9101	Console 9101	Pers1	998_10_supervisor	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0001	U9980001	U9980001	Pers1	998_10_supervisor	TRUE	TRUE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9102	Cons9102	Console 9102	Pers1	998_10_supervisor	TRUE	FALSE	FALSE	P25 Full Rate	TRUE

24.3 Talk Groups

TG Id	Region Id	Agency Id	Name	Description	SPNI	Property Id	Priority Id	Coverage	Valid Coverage	Announcement Group	Test Partition Only	Type	Preferred Vocoder	ISSI Site	Transcoding Allowed
9900	10	998	PS-28-AN	VAQ SitSim01	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	Analog/ADPCM		TRUE
9901	10	998	Tone-25	VAQ SitSim02	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
9902	10	998	AmpFreq	VAQ SitSim03	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
9903	10	998	PseudSp	VAQ SitSim04	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
9904	10	998	Phrases	VAQ SitSim05	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
9905	10	998	SiteSm1	VAQ SitSim06	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
9906	10	998	SiteSm2	VAQ SitSim07	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
9907	10	998	SiteSm3	VAQ SitSim08	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE

9908	10	998	SiteSm 4	VAQ SitSim09	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:Al lSites:AllP SAPs	None	FALSE	Genera l	P25 Full Rate		TRUE
9909	10	998	SiteSm 5	VAQ SitSim10	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:Al lSites:AllP SAPs	None	FALSE	Genera l	P25 Full Rate		TRUE
9910	10	998	SiteSm 6	VAQ SitSim11	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:Al lSites:AllP SAPs	None	FALSE	Genera l	P25 Full Rate		TRUE
9911	10	998	T-25-HR	VAQ SitSim12	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:Al lSites:AllP SAPs	None	FALSE	Genera l	P25 Half Rate		TRUE
9912	10	998	AF-HR	VAQ SitSim13	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:Al lSites:AllP SAPs	None	FALSE	Genera l	P25 Half Rate		TRUE
9913	10	998	PSp-HR	VAQ SitSim14	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:Al lSites:AllP SAPs	None	FALSE	Genera l	P25 Half Rate		TRUE
9914	10	998	Phrs-HR	VAQ SitSim15	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:Al lSites:AllP SAPs	None	FALSE	Genera l	P25 Half Rate		TRUE
9915	10	998	T-25-AN	VAQ SitSim16	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:Al lSites:AllP SAPs	None	FALSE	Genera l	Analog/ADP CM		TRUE
9916	10	998	AF-AN	VAQ SitSim17	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:Al lSites:AllP SAPs	None	FALSE	Genera l	Analog/ADP CM		TRUE
9917	10	998	P-Sp-AN	VAQ SitSim18	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:Al lSites:AllP SAPs	None	FALSE	Genera l	Analog/ADP CM		TRUE

9918	10	998	Phrs-AN	VAQ SitSim19	1	3	3	AllRegs:AllSites:AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	Analog/ADPCM		TRUE
9919	10	998	VAQ20	VAQ SitSim20	1	3	3	AllRegs:AllSites:AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
9920	10	998	DVSITV	VAQ SitSim21	1	3	3	AllRegs:AllSites:AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Half Rate		TRUE
9921	10	998	T-25OS	VAQ SitSim22	1	3	3	AllRegs:AllSites:AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE		TRUE
9922	10	998	AF-OS	VAQ SitSim23	1	3	3	AllRegs:AllSites:AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE		TRUE
9923	10	998	P-SpOS	VAQ SitSim24	1	3	3	AllRegs:AllSites:AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE		TRUE
9924	10	998	PhrsOS	VAQ SitSim25	1	3	3	AllRegs:AllSites:AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE		TRUE
9925	10	998	T-25OS2	VAQ SitSim26	1	3	3	AllRegs:AllSites:AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE+2		TRUE
9926	10	998	AF-OS2	VAQ SitSim27	1	3	3	AllRegs:AllSites:AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE		TRUE
9927	10	998	P-SpOS2	VAQ SitSim28	1	3	3	AllRegs:AllSites:AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE+2		TRUE

9928	10	998	PhrsOS 2	VAQ SitSim29	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE+2		TRUE
9929	10	998	VAQ30	VAQ SitSim30	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
64000	10	998	64000 ALL	TG64000 P25 Full Rate All Call	1	3	7	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	All-Call	P25 Full Rate		FALSE
64001	10	998	64001 TUL	TG64001 TG64001 P25 Full Rate TX Unconf Low Priority	1	3	3	P25Sites_PSAPs	P25Sites_PSAPs	64007:64007ANN	FALSE	General	P25 Full Rate	010:Region 10--111:ISSI_SITE	TRUE
64002	10	998	64002 TUM	TG64002 P25 Full Rate TX Unconf Med Priority	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	64007:64007ANN	FALSE	General	P25 Full Rate	010:Region 10--111:ISSI_SITE	TRUE
64003	10	998	64003 TUM	TG64003 P25 Full Rate TX Unconf Med Priority	1	5	5	P25Sites_PSAPs	P25Sites_PSAPs	64007:64007ANN	FALSE	General	P25 Full Rate	010:Region 10--111:ISSI_SITE	TRUE
64004	10	998	64004 TUM	TG64004 P25 Full Rate TX Unconf Med Priority	1	4	5	P25Sites_PSAPs	P25Sites_PSAPs	64007:64007ANN	FALSE	General	P25 Full Rate	010:Region 10--111:ISSI_SITE	TRUE

64005	10	998	64005 TUM	TG64005 P25 Full Rate Msg Unconf Med Priority	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	64007:64007ANN	FALSE	General	P25 Full Rate	010:Region 10--111:ISSI_SITE	TRUE
64006	10	998	64006 TUH	TG64006 P25 Full Rate Msg Unconf High Priority	1	3	6	P25Sites_PSAPs	P25Sites_PSAPs	64007:64007ANN	FALSE	General	P25 Full Rate		TRUE
64007	10	998	64007 ANN	TG64007 P25 Full Rate Announcement	1	3	6	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	Announcement	P25 Full Rate		TRUE
64051	10	998	64051 TUL	TG64051 P25 Half Rate Low Priority	1	3	3	P25Sites_PSAPs	P25Sites_PSAPs	64057:64057ANN	FALSE	General	P25 Half Rate		TRUE
64052	10	998	64052 TUM	TG64052 P25 Half Rate Med Priority	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	64057:64057ANN	FALSE	General	P25 Half Rate		TRUE
64053	10	998	64053 TUM	TG64053 P25 Half Rate Med Priority	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	64057:64057ANN	FALSE	General	P25 Half Rate		TRUE
64054	10	998	64054 TUM	TG64054 P25 Half Rate Med Priority	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	64057:64057ANN	FALSE	General	P25 Half Rate		TRUE

64055	10	998	64055 TUM	TG64055 P25 Half Rate Med Priority	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	64057:64057ANN	FALSE	General	P25 Half Rate		TRUE
64056	10	998	64056 TUH	TG64056 P25 Half Rate High Priority	1	3	6	P25Sites_PSAPs	P25Sites_PSAPs	64057:64057ANN	FALSE	General	P25 Half Rate		TRUE
64057	10	998	64057 ANN	TG64057 P25 Half Rate Announcement	1	3	6	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	Announcement	P25 Half Rate		FALSE
64100	10	998	64100 ALL	TG64100 P25 Full Rate All Call	1	3	7	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	All-Call	P25 Full Rate		FALSE
64101	10	998	64101 TCL	TG64101 P25 Full Rate Conf Low Priority	1	4	3	P25Sites_PSAPs	P25Sites_PSAPs	64107:64107ANN	FALSE	General	P25 Full Rate		TRUE
64102	10	998	64102 TCM	TG64102 P25 Full Rate Conf Med Priority	1	4	5	P25Sites_PSAPs	P25Sites_PSAPs	64107:64107ANN	FALSE	General	P25 Full Rate		TRUE
64103	10	998	64103 TCM	TG64103 P25 Full Rate Conf Med Priority	1	4	5	P25Sites_PSAPs	P25Sites_PSAPs	64107:64107ANN	FALSE	General	P25 Full Rate		TRUE
64104	10	998	64104 TCM	TG64104 P25 Full Rate Conf Med Priority	1	4	5	P25Sites_PSAPs	P25Sites_PSAPs	64107:64107ANN	FALSE	General	P25 Full Rate		TRUE

64105	10	998	64105 TCM	TG64105 P25 Full Rate Conf Med Priority	1	4	5	P25Sites _PSAPs	P25Sites_ PSAPs	64107:64107ANN	FALSE	General	P25 Full Rate		TRUE
64106	10	998	64106 TCH	TG64106 P25 Full Rate Conf High Priority	1	4	6	P25Sites _PSAPs	P25Sites_ PSAPs	64107:64107ANN	FALSE	General	P25 Full Rate		TRUE
64107	10	998	64107 ANN	TG64107 P25 Full Rate Announcement	1	4	6	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	Announcement	P25 Full Rate		TRUE
64151	10	998	64151 TCL	TG64151 P25 Half Rate Low Priority	1	4	3	P25Sites _PSAPs	P25Sites_ PSAPs	64157:64157ANN	FALSE	General	P25 Half Rate		TRUE
64152	10	998	64152 TCM	TG64152 P25 Half Rate Med Priority	1	4	5	P25Sites _PSAPs	P25Sites_ PSAPs	64157:64157ANN	FALSE	General	P25 Half Rate		TRUE
64153	10	998	64153 TCM	TG64153 P25 Half Rate Med Priority	1	4	5	P25Sites _PSAPs	P25Sites_ PSAPs	64157:64157ANN	FALSE	General	P25 Half Rate		TRUE
64154	10	998	64154 TCM	TG64154 P25 Half Rate Med Priority	1	4	5	P25Sites _PSAPs	P25Sites_ PSAPs	64157:64157ANN	FALSE	General	P25 Half Rate		TRUE
64155	10	998	64155 TCM	TG64155 P25 Half Rate Med Priority	1	4	5	P25Sites _PSAPs	P25Sites_ PSAPs	64157:64157ANN	FALSE	General	P25 Half Rate		TRUE

64156	10	998	64156 TCH	TG64156 P25 Half Rate High Priority	1	4	6	P25Sites_PSAPs	P25Sites_PSAPs	64157:64157ANN	FALSE	General	P25 Half Rate		TRUE
64157	10	998	64157 ANN	TG64157 P25 Half Rate Announcement	1	4	6	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	Announcement	P25 Half Rate		FALSE
64201	10	998	64201 TUE	TG64201 P25 Full Rate Unconf Encrypted	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	P25 Full Rate		TRUE
64202	10	998	64202 TUE	TG64202 P25 Full Rate Unconf Encrypted	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	P25 Full Rate		TRUE
64203	10	998	64203 TCE	TG64203 P25 Full Rate Conf Encrypted	1	4	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	P25 Full Rate		TRUE
64204	10	998	64204 TCE	TG64204 P25 Full Rate Conf Encrypted	1	4	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	P25 Full Rate		TRUE
64251	10	998	64251 TUE	TG64251 P25 Half Rate Unconf Encrypted	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	P25 Half Rate		TRUE
64252	10	998	64252 TUE	TG64252 P25 Half Rate Unconf Encrypted	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	P25 Half Rate		TRUE

64253	10	998	64253 TCE	TG64253 P25 Half Rate Conf Encrypted	1	4	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	P25 Half Rate		TRUE
64254	10	998	64254 TCE	TG64254 P25 Half Rate Conf Encrypted	1	4	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	P25 Half Rate		TRUE
64301	10	998	64301 MUM	TG64301 P25 Full Rate MT Unconf Med Priority	1	5	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	P25 Full Rate		TRUE
64302	10	998	64302 MUM	TG64302 P25 Full Rate MT Unconf Med Priority	1	5	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	P25 Full Rate		TRUE
64303	10	998	64303 MUM	TG64303 P25 Full Rate MT Unconf Med Priority	1	5	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	P25 Full Rate		TRUE
64304	10	998	64304 MUM	TG64304 P25 Full Rate MT Unconf Med Priority	1	5	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	P25 Full Rate		TRUE
64305	10	998	64305 MCM	TG64305 P25 Full Rate MT Conf Med Priority	1	6	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	P25 Full Rate		TRUE

64306	10	998	64306 MCM	TG64306 P25 Full Rate MT Conf Med Priority	1	6	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	Genera l	P25 Full Rate		TRUE
64307	10	998	64307 MCM	TG64307 P25 Full Rate MT Conf Med Priority	1	6	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	Genera l	P25 Full Rate		TRUE
64308	10	998	64308 MCM	TG64308 P25 Full Rate MT Conf Med Priority	1	6	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	Genera l	P25 Full Rate		TRUE
64351	10	998	64351 MUM	TG64351 P25 Half Rate MT Unconf Med Priority	1	5	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	Genera l	P25 Half Rate		TRUE
64352	10	998	64352 MUM	TG64352 P25 Half Rate MT Unconf Med Priority	1	5	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	Genera l	P25 Half Rate		TRUE
64353	10	998	64353 MUM	TG64353 P25 Half Rate MT Unconf Med Priority	1	5	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	Genera l	P25 Half Rate		TRUE
64354	10	998	64354 MUM	TG64354 P25 Half Rate MT	1	5	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	Genera l	P25 Half Rate		TRUE

				Unconf Med Priority											
64355	10	998	64355 MCM	TG64355 P25 Half Rate MT Conf Med Priority	1	6	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	P25 Half Rate		TRUE
64356	10	998	64356 MCM	TG64356 P25 Half Rate MT Conf Med Priority	1	6	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	P25 Half Rate		TRUE
64357	10	998	64357 MCM	TG64357 P25 Half Rate MT Conf Med Priority	1	6	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	P25 Half Rate		TRUE
64358	10	998	64358 MCM	TG64358 P25 Half Rate MT Conf Med Priority	1	6	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	P25 Half Rate		TRUE
64400	10	998	64400 OSTUH	TG64400 OS AMBE TX Unconf High Priority	1	3	6	AllRegs:AllSites:AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE+2		TRUE
64401	10	998	64401 OSTUM	TG64401 OS AMBE TX Unconf Med Priority	1	3	5	AllRegs:AllSites:AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE+2		TRUE
64402	10	998	64402 OSTUM	TG64402 OS AMBE TX	1	3	5	AllRegs:AllSites:AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE+2		TRUE

				Unconf Med Priority											
64403	10	998	64403 OSTUM	TG64403 OS AMBE MT Unconf Med Priority	1	5	5	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE+2		TRUE
64404	10	998	64404 OSTUL	TG64404 OS AMBE TX Unconf Low Priority	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE+2		TRUE
64450	10	998	64450 ANA	TG64450 Analog ADPCM Med Priority	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	IP Console Intercom	Analog/ADPCM		TRUE
64451	10	998	64451 ANA	TG64451 Analog ADPCM Med Priority	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	Analog/ADPCM		TRUE
64452	10	998	64452 ANA	TG64452 Analog ADPCM Med Priority	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	Analog/ADPCM		TRUE
64453	10	998	64453 ANA	TG64453 Analog ADPCM Med Priority	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	Analog/ADPCM		TRUE
9900	10	998	PS-28-AN	VAQ SitSim01	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	Analog/ADPCM		TRUE

9901	10	998	Tone-25	VAQ SitSim02	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
9902	10	998	AmpFreq	VAQ SitSim03	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
9903	10	998	PseudSp	VAQ SitSim04	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
9904	10	998	Phrases	VAQ SitSim05	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
9905	10	998	SiteSm1	VAQ SitSim06	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
9906	10	998	SiteSm2	VAQ SitSim07	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
9907	10	998	SiteSm3	VAQ SitSim08	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
9908	10	998	SiteSm4	VAQ SitSim09	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
9909	10	998	SiteSm5	VAQ SitSim10	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
9910	10	998	SiteSm6	VAQ SitSim11	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE

9911	10	998	T-25-HR	VAQ SitSim12	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Half Rate		TRUE
9912	10	998	AF-HR	VAQ SitSim13	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Half Rate		TRUE
9913	10	998	PSp-HR	VAQ SitSim14	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Half Rate		TRUE
9914	10	998	Phrs-HR	VAQ SitSim15	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Half Rate		TRUE
9915	10	998	T-25-AN	VAQ SitSim16	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	Analog/ADP CM		TRUE
9916	10	998	AF-AN	VAQ SitSim17	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	Analog/ADP CM		TRUE
9917	10	998	P-Sp-AN	VAQ SitSim18	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	Analog/ADP CM		TRUE
9918	10	998	Phrs-AN	VAQ SitSim19	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	Analog/ADP CM		TRUE
9919	10	998	VAQ20	VAQ SitSim20	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
9920	10	998	DVSITV	VAQ SitSim21	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Half Rate		TRUE

9921	10	998	T-25OS	VAQ SitSim22	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE		TRUE
9922	10	998	AF-OS	VAQ SitSim23	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE		TRUE
9923	10	998	P-SpOS	VAQ SitSim24	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE		TRUE
9924	10	998	PhrsOS	VAQ SitSim25	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE		TRUE
9925	10	998	T-25OS2	VAQ SitSim26	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE+2		TRUE
9926	10	998	AF-OS2	VAQ SitSim27	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE		TRUE
9927	10	998	P-SpOS2	VAQ SitSim28	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE+2		TRUE
9928	10	998	PhrsOS2	VAQ SitSim29	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE+2		TRUE
9929	10	998	VAQ30	VAQ SitSim30	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
64000	10	998	64000 ALL	TG64000 P25 Full Rate All Call	1	3	7	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	All-Call	P25 Full Rate		FALSE

64001	10	998	64001 TUL	TG64001 TG64001 P25 Full Rate TX Unconf Low Priority	1	3	3	P25Sites _PSAPs	P25Sites_ PSAPs	64007:64007ANN	FALSE	General	P25 Full Rate	010:Region 10--111:ISSI_SITE	TRUE
64002	10	998	64002 TUM	TG64002 P25 Full Rate TX Unconf Med Priority	1	3	5	P25Sites _PSAPs	P25Sites_ PSAPs	64007:64007ANN	FALSE	General	P25 Full Rate	010:Region 10--111:ISSI_SITE	TRUE
64003	10	998	64003 TUM	TG64003 P25 Full Rate TX Unconf Med Priority	1	5	5	P25Sites _PSAPs	P25Sites_ PSAPs	64007:64007ANN	FALSE	General	P25 Full Rate	010:Region 10--111:ISSI_SITE	TRUE
64004	10	998	64004 TUM	TG64004 P25 Full Rate TX Unconf Med Priority	1	4	5	P25Sites _PSAPs	P25Sites_ PSAPs	64007:64007ANN	FALSE	General	P25 Full Rate	010:Region 10--111:ISSI_SITE	TRUE
64005	10	998	64005 TUM	TG64005 P25 Full Rate Msg Unconf Med Priority	1	3	5	P25Sites _PSAPs	P25Sites_ PSAPs	64007:64007ANN	FALSE	General	P25 Full Rate	010:Region 10--111:ISSI_SITE	TRUE
64006	10	998	64006 TUH	TG64006 P25 Full Rate Msg Unconf High Priority	1	3	6	P25Sites _PSAPs	P25Sites_ PSAPs	64007:64007ANN	FALSE	General	P25 Full Rate		TRUE

64007	10	998	64007 ANN	TG64007 P25 Full Rate Announcement	1	3	6	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	Announcement	P25 Full Rate		TRUE
64051	10	998	64051 TUL	TG64051 P25 Half Rate Low Priority	1	3	3	P25Sites_PSAPs	P25Sites_PSAPs	64057:64057ANN	FALSE	General	P25 Half Rate		TRUE
64052	10	998	64052 TUM	TG64052 P25 Half Rate Med Priority	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	64057:64057ANN	FALSE	General	P25 Half Rate		TRUE
64053	10	998	64053 TUM	TG64053 P25 Half Rate Med Priority	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	64057:64057ANN	FALSE	General	P25 Half Rate		TRUE
64054	10	998	64054 TUM	TG64054 P25 Half Rate Med Priority	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	64057:64057ANN	FALSE	General	P25 Half Rate		TRUE
64055	10	998	64055 TUM	TG64055 P25 Half Rate Med Priority	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	64057:64057ANN	FALSE	General	P25 Half Rate		TRUE
64056	10	998	64056 TUH	TG64056 P25 Half Rate High Priority	1	3	6	P25Sites_PSAPs	P25Sites_PSAPs	64057:64057ANN	FALSE	General	P25 Half Rate		TRUE
64057	10	998	64057 ANN	TG64057 P25 Half Rate	1	3	6	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	Announcement	P25 Half Rate		FALSE

				Announcement											
64100	10	998	64100 ALL	TG64100 P25 Full Rate All Call	1	3	7	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	All-Call	P25 Full Rate		FALSE
64101	10	998	64101 TCL	TG64101 P25 Full Rate Conf Low Priority	1	4	3	P25Sites_PSAPs	P25Sites_PSAPs	64107:64107ANN	FALSE	General	P25 Full Rate		TRUE
64102	10	998	64102 TCM	TG64102 P25 Full Rate Conf Med Priority	1	4	5	P25Sites_PSAPs	P25Sites_PSAPs	64107:64107ANN	FALSE	General	P25 Full Rate		TRUE
64103	10	998	64103 TCM	TG64103 P25 Full Rate Conf Med Priority	1	4	5	P25Sites_PSAPs	P25Sites_PSAPs	64107:64107ANN	FALSE	General	P25 Full Rate		TRUE
64104	10	998	64104 TCM	TG64104 P25 Full Rate Conf Med Priority	1	4	5	P25Sites_PSAPs	P25Sites_PSAPs	64107:64107ANN	FALSE	General	P25 Full Rate		TRUE
64105	10	998	64105 TCM	TG64105 P25 Full Rate Conf Med Priority	1	4	5	P25Sites_PSAPs	P25Sites_PSAPs	64107:64107ANN	FALSE	General	P25 Full Rate		TRUE
64106	10	998	64106 TCH	TG64106 P25 Full Rate Conf High Priority	1	4	6	P25Sites_PSAPs	P25Sites_PSAPs	64107:64107ANN	FALSE	General	P25 Full Rate		TRUE
64107	10	998	64107 ANN	TG64107 P25 Full Rate	1	4	6	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	Announcement	P25 Full Rate		TRUE

				Announcement											
64151	10	998	64151 TCL	TG64151 P25 Half Rate Low Priority	1	4	3	P25Sites_PSAPs	P25Sites_PSAPs	64157:64157ANN	FALSE	General	P25 Half Rate		TRUE
64152	10	998	64152 TCM	TG64152 P25 Half Rate Med Priority	1	4	5	P25Sites_PSAPs	P25Sites_PSAPs	64157:64157ANN	FALSE	General	P25 Half Rate		TRUE
64153	10	998	64153 TCM	TG64153 P25 Half Rate Med Priority	1	4	5	P25Sites_PSAPs	P25Sites_PSAPs	64157:64157ANN	FALSE	General	P25 Half Rate		TRUE
64154	10	998	64154 TCM	TG64154 P25 Half Rate Med Priority	1	4	5	P25Sites_PSAPs	P25Sites_PSAPs	64157:64157ANN	FALSE	General	P25 Half Rate		TRUE
64155	10	998	64155 TCM	TG64155 P25 Half Rate Med Priority	1	4	5	P25Sites_PSAPs	P25Sites_PSAPs	64157:64157ANN	FALSE	General	P25 Half Rate		TRUE
64156	10	998	64156 TCH	TG64156 P25 Half Rate High Priority	1	4	6	P25Sites_PSAPs	P25Sites_PSAPs	64157:64157ANN	FALSE	General	P25 Half Rate		TRUE
64157	10	998	64157 ANN	TG64157 P25 Half Rate Announcement	1	4	6	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	Announcement	P25 Half Rate		FALSE

64201	10	998	64201 TUE	TG64201 P25 Full Rate Unconf Encrypted	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	P25 Full Rate		TRUE
64202	10	998	64202 TUE	TG64202 P25 Full Rate Unconf Encrypted	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	P25 Full Rate		TRUE
64203	10	998	64203 TCE	TG64203 P25 Full Rate Conf Encrypted	1	4	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	P25 Full Rate		TRUE
64204	10	998	64204 TCE	TG64204 P25 Full Rate Conf Encrypted	1	4	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	P25 Full Rate		TRUE
64251	10	998	64251 TUE	TG64251 P25 Half Rate Unconf Encrypted	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	P25 Half Rate		TRUE
64252	10	998	64252 TUE	TG64252 P25 Half Rate Unconf Encrypted	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	P25 Half Rate		TRUE
64253	10	998	64253 TCE	TG64253 P25 Half Rate Conf Encrypted	1	4	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	P25 Half Rate		TRUE
64254	10	998	64254 TCE	TG64254 P25 Half Rate Conf Encrypted	1	4	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	P25 Half Rate		TRUE

64301	10	998	64301 MUM	TG64301 P25 Full Rate MT Unconf Med Priority	1	5	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	P25 Full Rate		TRUE
64302	10	998	64302 MUM	TG64302 P25 Full Rate MT Unconf Med Priority	1	5	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	P25 Full Rate		TRUE
64303	10	998	64303 MUM	TG64303 P25 Full Rate MT Unconf Med Priority	1	5	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	P25 Full Rate		TRUE
64304	10	998	64304 MUM	TG64304 P25 Full Rate MT Unconf Med Priority	1	5	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	P25 Full Rate		TRUE
64305	10	998	64305 MCM	TG64305 P25 Full Rate MT Conf Med Priority	1	6	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	P25 Full Rate		TRUE
64306	10	998	64306 MCM	TG64306 P25 Full Rate MT Conf Med Priority	1	6	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	P25 Full Rate		TRUE
64307	10	998	64307 MCM	TG64307 P25 Full Rate MT	1	6	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	P25 Full Rate		TRUE

				Conf Med Priority											
64308	10	998	64308 MCM	TG64308 P25 Full Rate MT Conf Med Priority	1	6	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	P25 Full Rate		TRUE
64351	10	998	64351 MUM	TG64351 P25 Half Rate MT Unconf Med Priority	1	5	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	P25 Half Rate		TRUE
64352	10	998	64352 MUM	TG64352 P25 Half Rate MT Unconf Med Priority	1	5	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	P25 Half Rate		TRUE
64353	10	998	64353 MUM	TG64353 P25 Half Rate MT Unconf Med Priority	1	5	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	P25 Half Rate		TRUE
64354	10	998	64354 MUM	TG64354 P25 Half Rate MT Unconf Med Priority	1	5	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	P25 Half Rate		TRUE
64355	10	998	64355 MCM	TG64355 P25 Half Rate MT Conf Med Priority	1	6	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	P25 Half Rate		TRUE

64356	10	998	64356 MCM	TG64356 P25 Half Rate MT Conf Med Priority	1	6	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	Genera l	P25 Half Rate		TRUE
64357	10	998	64357 MCM	TG64357 P25 Half Rate MT Conf Med Priority	1	6	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	Genera l	P25 Half Rate		TRUE
64358	10	998	64358 MCM	TG64358 P25 Half Rate MT Conf Med Priority	1	6	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	Genera l	P25 Half Rate		TRUE
64400	10	998	64400 OSTUH	TG64400 OS AMBE TX Unconf High Priority	1	3	6	AllRegs: AllSites: AllPSAPs	AllRegs:Al lSites:AllP SAPs	None	FALSE	Genera l	OpenSky 2400 AMBE+2		TRUE
64401	10	998	64401 OSTU M	TG64401 OS AMBE TX Unconf Med Priority	1	3	5	AllRegs: AllSites: AllPSAPs	AllRegs:Al lSites:AllP SAPs	None	FALSE	Genera l	OpenSky 2400 AMBE+2		TRUE
64402	10	998	64402 OSTU M	TG64402 OS AMBE TX Unconf Med Priority	1	3	5	AllRegs: AllSites: AllPSAPs	AllRegs:Al lSites:AllP SAPs	None	FALSE	Genera l	OpenSky 2400 AMBE+2		TRUE
64403	10	998	64403 OSTU M	TG64403 OS AMBE MT Unconf Med Priority	1	5	5	AllRegs: AllSites: AllPSAPs	AllRegs:Al lSites:AllP SAPs	None	FALSE	Genera l	OpenSky 2400 AMBE+2		TRUE

64404	10	998	64404 OSTUL	TG64404 OS AMBE TX Unconf Low Priority	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE+2		TRUE
64450	10	998	64450 ANA	TG64450 Analog ADPCM Med Priority	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	IP Console Intercom	Analog/ADPCM		TRUE
64451	10	998	64451 ANA	TG64451 Analog ADPCM Med Priority	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	Analog/ADPCM		TRUE
64452	10	998	64452 ANA	TG64452 Analog ADPCM Med Priority	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	Analog/ADPCM		TRUE
64453	10	998	64453 ANA	TG64453 Analog ADPCM Med Priority	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	Analog/ADPCM		TRUE

24.4 PSAPs

Region Id	Agency Id	PSAP Id	Device Id	Name	Description	Max Talk Paths	Service Type
10	998	9101	1	Console9101	Console9101	7	IP Console
10	998	9102	1	Console9102	Console9102	7	IP Console
10	998	7001	1	VTI7001	VTI7001	16	VTI
10	998	7002	1	VTI7002	VTI7002	16	VTI
10	998	9103	1	Console9103	Console9103	7	IP Console
10	998	9104	1	Console9104	Console9104	7	IP Console
10	998	9105	1	Console9105	Console9105	7	IP Console
10	998	9106	1	Console9106	Console9106	7	IP Console
10	998	9107	1	Console9107	Console9107	7	IP Console
10	998	9108	1	Console9108	Console9108	7	IP Console
10	998	9109	1	Console9109	Console9109	7	IP Console
10	998	9110	1	Console9110	Console9110	7	IP Console

Region Id	Agency Id	P25 IP Address	OpenSky IP Address	Description	Electronic Serial Number	Protocol Mask	Status	Sub Type	Assigned End User	Algorithm Support
10	998		10.128.111.19	OS_Radio_19	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.20	OS_Radio_20	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.2	OS_Radio_02	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.3	OS_Radio_03	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.4	OS_Radio_04	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.5	OS_Radio_05	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.6	OS_Radio_06	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.7	OS_Radio_07	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.8	OS_Radio_08	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.9	OS_Radio_09	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.10	OS_Radio_10	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.11	OS_Radio_11	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.12	OS_Radio_12	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.13	OS_Radio_13	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.14	OS_Radio_14	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.15	OS_Radio_15	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.16	OS_Radio_16	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.1	OS_Radio_1	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.17	OS_Radio_17	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.18	OS_Radio_18	0000000000000000	OpenSky	Enabled Unit			
10	998	10.128.79.9		Radio9	0000000109980009	P25	Enabled Unit	Harris XG-75 Portable	010:998:0009	AES
10	998	10.128.79.10		Radio10	0000000109980010	P25	Enabled Unit	Harris XG-75 Portable	010:998:0010	AES
10	998	10.128.79.8		Radio8	0000000109980008	P25	Enabled Unit	Harris XG-75 Portable	010:998:0008	AES
10	998	10.128.53.1		Console9101	0000000109989101	P25	Enabled Unit	Maestro Console	010:998:9101	AES
10	998	10.128.53.2		Console 9102	0000000109989102	P25	Enabled Unit	Maestro Console	010:998:9102	Both
10	998	10.128.79.1		Radio1	0000000109980001	P25	Enabled Unit	Harris P5400	010:998:0001	AES

10	998	10.128.79.2	Radio2	0000000109980002	P25	Enabled Unit	Harris P5400	010:998:0002	AES
10	998	10.128.79.3	Radio3	0000000109980003	P25	Enabled Unit	Harris XG-75 Portable	010:998:0003	AES
10	998	10.128.79.4	Radio4	0000000109980004	P25	Enabled Unit	Harris XG-75 Portable	010:998:0004	AES
10	998	10.128.79.5	Radio5	0000000109980005	P25	Enabled Unit	Harris XG-75 Portable	010:998:0005	AES
10	998	10.128.79.6	Radio6	0000000109980006	P25	Enabled Unit	Harris XG-75 Portable	010:998:0006	AES
10	998	10.128.79.7	Radio7	0000000109980007	P25	Enabled Unit	Harris XG-75 Portable	010:998:0007	AES
10	998	10.128.79.11	Radio11	0000000109980011	P25	Enabled Unit	Harris UNITY XG-100P	010:998:0011	AES
10	998	10.128.79.12	Radio12	0000000109980012	P25	Enabled Unit	Harris UNITY XG-100P	010:998:0012	AES
10	998	10.128.1.161	s0u1xcda	0000000000000000	P25	Enabled Unit		010:998:9001	AES
10	998	10.128.1.162	s0u1xcdb	0000000000000000	P25	Enabled Unit		010:998:9005	AES

25. Action Items

Test #	Page #	Action/Issue	Date Resolved	Resolution

COVERAGE CHARACTERIZATION TEST PROCEDURES

Table of Contents

ABOUT THIS DOCUMENT

This document was specifically prepared for the customer shown below. Each section of this document is individually maintained in the Harris document control system. The revisions of each section are individually listed.

Customer:	Nevada Shared Radio System (NSRS) - Washoe County
Prepared By:	Jerome Daniszewski
Total Test Pages:	**24**

DOCUMENT USAGE

Although specific tests are not included relating to electrical measurements or timing parameters of equipment, Harris measures and records these tests and levels as part of our standard installation practices. These parameters include but are not limited to:

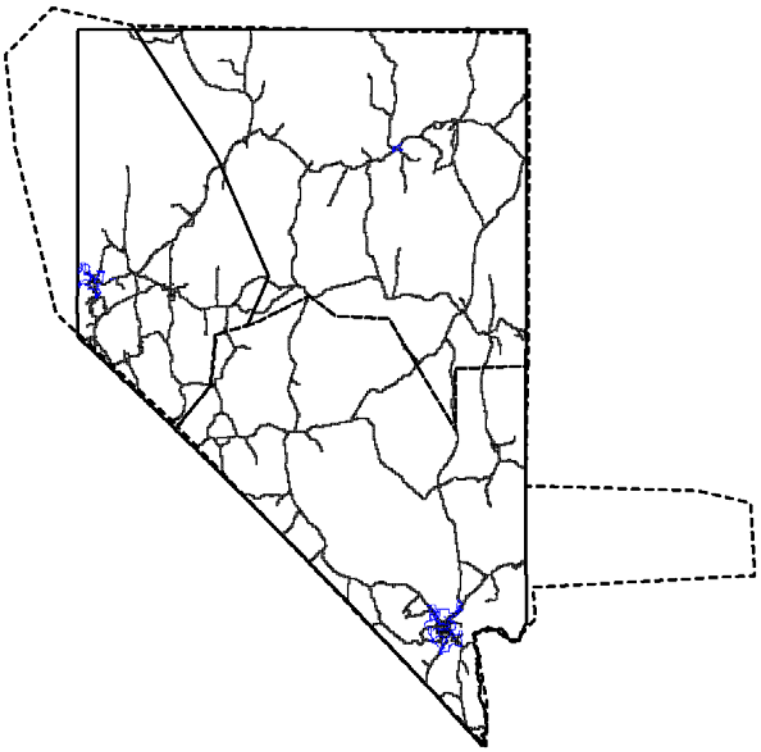
- Transmit Frequency and Deviation
- Output and Reflected Power
- Receiver Sensitivity
- Receiver Multicoupler Gain (if applicable)
- Receiver Preamplifier Gain (if applicable)
- Time Domain Reflectometry of Transmission Line
- Combiner Loss (if applicable)
- Audio line out
- Audio line in

We will provide system parameters and measurements to the NSRS Members as part of the final documentation package.

1. SERVICE AREA DEFINITIONS AND GRID STRUCTURE

TSB-88-D defines a service area as a boundary of the geographic area of concern for a user, and states that Validated CPC Service Area Reliability shall be determined by the percentage of test locations in the bounded service area that meet or exceed the specified CPC. We are proposing a Bounded Area design for NSRS as defined in TSB-88-D wherein coverage predictions are made out to the boundary of the defined service area and coverage is verified throughout the service area out to the boundary through the performance of a Validated CPC Service Area Reliability test. The service area is shown in Figure 1 and consists of the Nevada State Border and the state highways as defined by Attachment 4 of the NSRS Project RFP, the entirety of the three regions planned for the buildoout, and the Urban Areas as defined by NSRS.

Figure 1 – Nevada Shared Radio System Service Areas



TSB-88-D recommends coverage verification measurements at a statistically significant number of random test locations, uniformly distributed throughout the service area. We divide the service area by a test grid pattern using TSB-88-D Estimate of Proportions analysis to determine the number and size of the test tiles providing both statistically significant

measurement results and a high confidence that the results are a true indication of the installed radio system coverage.

Table 1 provides our recommended tile sizes to obtain a uniform distribution of tiles throughout the customer defined service areas.

Table 1 - Coverage Service Area, Tile Size, and Tile Count

Service Area Definition	Tile Size (miles)	Accessible Tile Count
NSRS Boundary, consisting of	1 x 1 mile	~ 80,900
Region 1		~ 30,000
Region 2		~ 19,650
Region 3		~ 31,250
State Highways	1 x 1 mile	~ 5600
10% of tiles within cities	¼ X ¼ mile	~ 1000*0.1 = 100

The grid pattern overlays onto street maps and we determine a drive test route that will pass through all accessible tiles (i.e. have roads) within the defined service area boundaries, with an approximately equal distance traveled in each tile. Accessible tiles are based on access to the tile from a road included in the US Census Bureau TIGER roads database. In order to include as many test tiles as possible, the following roads have been deemed accessible:

- Primary Roads
- Secondary Roads
- Local Roads (Streets)
- Ramps
- Service Drives
- Vehicular Trails
- Private Service Roads

The drive route should pass through each tile at least once but not more than twice, as far as is practically possible. The defined drive route should not pass through tunnels, underpasses, underground garages, or other man made obstructive areas where radio coverage is not

planned or expected. If a drive route passes through any of these areas, we disable the TYPHON test unit to prevent collection of data in these areas.

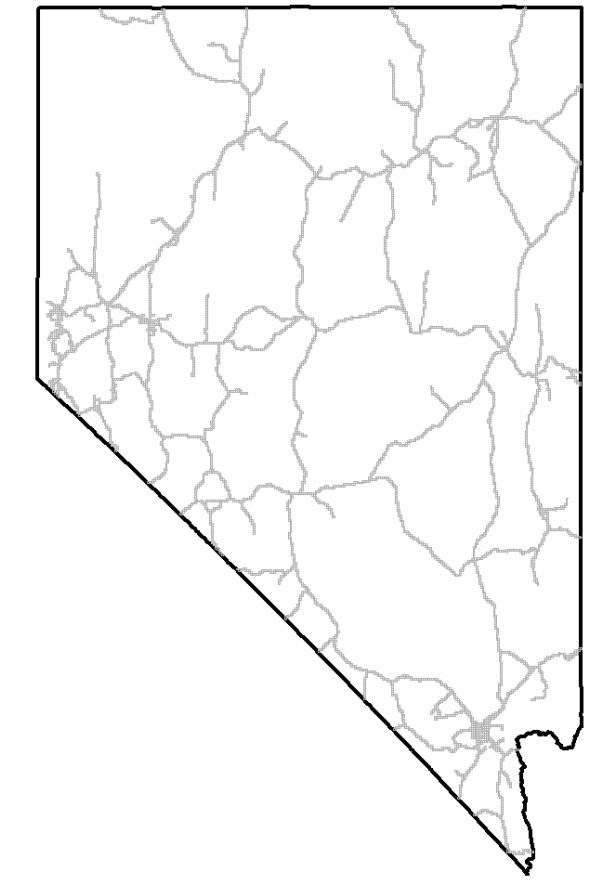
Measurements will be made in all accessible tiles within the defined service area boundaries. We do not use test measurements along the drive route that are outside of each service area boundary. Any areas or accessible tiles within the service area boundary that NSRS decides not to test will have coverage scored as a PASS in the reliability calculations.

We will discard inaccessible tiles (i.e. have no roads) from the reliability calculations with the acceptance criteria adjusted by treating the inaccessible tiles as exclusion zones.
The statewide accessible grid structure is shown in **Figure 2 - NSRS Accessible Grid Structure**. **Figure 2** also includes the 3 regional boundaries used to plan the build-out and test of the system.

Figure 2 - NSRS Accessible Grid Structure

The State highway grid structure is shown in Figure 3 – State Highway Grid Structure.

Figure 3 – State Highway Grid Structure



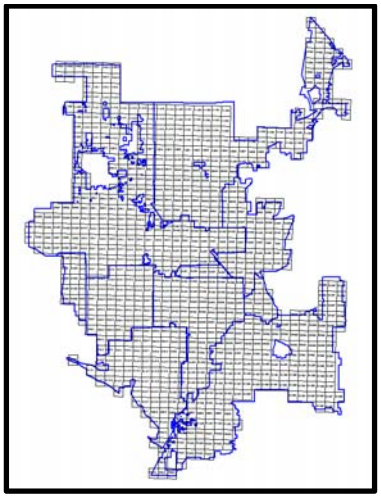
The following are the urban areas as defined in Section 1.4.1, Paragraph F:

- Las Vegas Metropolitan Area
- Reno/Sparks City Limits
- Elko City Limits

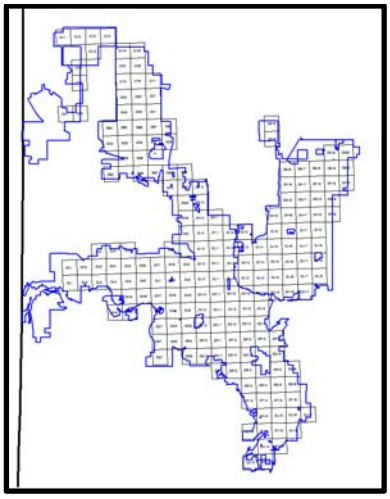
The Urban Areas grid structure is shown in Figure 4 – Urban Areas Grid Structure.

Figure 4 – Urban Areas Grid Structure**s**

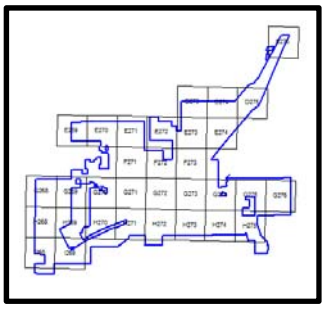
Las Vegas Metropolitan Area



Reno/Sparks City Limits



Elko City Limits



Ten percent of the urban area tiles will be characterized for DAQ Voice Quality per the RFP. Measurements will be made in all accessible grids within NSRS's defined service area boundaries. Test measurements along the drive route that are outside of NSRS's defined service area boundaries will not be counted. Any areas or accessible grids within the service area boundary that the NSRS Members decide not to test will have coverage scored as a PASS in the reliability calculations.

Harris Corporation reserves the right to update the maps and coverage guarantees after system implementation, through the change order process, in the event that radio sites or design parameters changed during the system build-out.

Inaccessible grid (i.e. have no roads) will be discarded from the reliability calculations with the % acceptance criteria adjusted by treating the inaccessible grids as exclusion zones.

2. TALK-OUT BIT ERROR RATE (BER) TEST

This Acceptance Test Procedure (ATP) is used by Harris for RF coverage verification based on Bit Error Rate (BER) measurements. This procedure provides an accurate, statistically valid, repeatable, objective, and cost-effective method to verify all the Members' coverage requirements are met.

This ATP is in conformance with the Telecommunications Industry Association (TIA) Telecommunications Systems Bulletin TSB-88.3-D titled "Wireless Communications Systems - Performance in Noise and Interference-Limited Situations - Recommended Methods for Technology-Independent Modeling, Simulation, and Verification". TSB-88-D has defined Channel Performance Criterion (CPC) as the specified minimum design performance level in a faded channel, and provides a set of Delivered Audio Quality (DAQ) CPCs that define subjective voice quality performance applicable to both analog voice and digital voice systems.
TSB-88-D also defines a service area as a boundary of the geographic area of concern for a user, and states that Validated CPC Service Area Reliability shall be determined by the percentage of test locations in the bounded service area that meet or exceed the specified CPC. Harris has proposed a Bounded Area design for the Nevada Shared Radio System as defined in TSB-88-D wherein coverage predictions are made out to the boundary of the defined service area and coverage is verified throughout the service area out to the boundary through the performance of a Validated CPC Service Area Reliability test.

RF coverage using this ATP is verified by measuring talk-out (base to portable) BER throughout NSRS's defined bounded service areas, and calculating the percentage of measurements that are equal or better than a BER of 2.4% required to support NSRS's specified CPC of DAQ 3.4.

2.1 Setup

Harris' TYPHON wireless testing system is utilized to measure BER. TYPHON consists of Harris portable radios, a GPS receiver to provide accurate position information for each measured data point, a computer with an internal clock that coordinates and records the test data, roof mounted antennas, and variable attenuators for use when portable coverage is being tested.

The TYPHON equipment will be mounted inside the test vehicle (an SUV/van for multiple BER measurements) with an external antenna(s) mounted on the outside and centrally located on the vehicle's roof, with no other equipment installed on the roof. For portable outdoor coverage verification, the variable attenuator will be set to the appropriate level to account for portable body losses. Attenuator values are shown in Table 2.

Table 2 - Coverage Service Area, Body/Building Loss, and Attenuator Values

Service Area Definition	Description	Body Loss (dB)	Attenuator Value (dB)*
All Service Areas	Portable Outdoor	7 dB	7

* The actual attenuator value, including Body Loss, will be determined prior to testing once the actual test vehicle and test set up configurations are finalized

Prior to taking BER measurements, each site must be audited to verify that the radio system is operating properly. The audits will verify the antenna configuration, the power into the antenna, the antenna installation, and the frequency of the test transmitter. Harris shall provide all test equipment necessary to perform the audits.

2.2 Data Measurements

For each of the three regions, each radio system base station site defined as part of that region continuously transmits a P25 test pattern data sequence on a working channel, and measurements of this signal are collected every 3 seconds by the TYPHON equipment mounted inside the test vehicle as it is driven along the defined test drive route. The software in the TYPHON laptop computer will automatically measure and record the test data and determine the BER for each 3-second measurement data record along the test drive route.

2.3 Data Analysis and Acceptance

As defined by Section 5 of TSB88-3, latest revision, we post-process all mean measurement data records collected from the drive test within the defined service area boundary, with data records recorded every 0.1-mile (typically) used in the final analysis.

Measurements that have a BER equal to or less than 2.4% are recorded as PASS; the remainder are recorded as FAIL. This acceptance criteria is for P25 Phase 2 operation. P25 Phase 1 operation will meet or exceed the system's Phase 2 coverage.

Harris will then calculate the ratio of PASS points to total number of points collected for the P25 system. The installed radio system coverage is deemed to meet the coverage requirements if, for each of the three regional bounded service areas in Table 3, the ratio of the number of PASS points to the total number of points in the service area equals or exceeds the minimum % Validated CPC Service Area Reliability acceptance criteria that is shown. If all three of the regions pass, the the NSRS Boundary passes.

Table 3 - Coverage Service Area, Service, and Acceptance Criteria

Service Area Definition	Description	% Validated CPC Service Area Reliability Acceptance Criteria
NSRS boundary, consisting of	Portable Outdoor	**69.5%**
Region 1	Portable Outdoor	**65.0%**
Region 2	Portable Outdoor	**67.5%**
Region 3	Portable Outdoor	**66.5%**
Nevada State Highways as customer defined	Portable Outdoor	90.1%

2.4 Results Presentation

The data records are plotted on a map showing the test grids, the areas tested and the test results. Different pen colors are used to show ranges of measured BER. A test report is also provided that summarizes the test results.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

3. TALK-IN BIT ERROR RATE (BER) TEST

This Coverage Acceptance Test Procedure (CATP) is used by Harris for RF coverage verification based on signal strength measurements. This procedure provides an accurate, statistically valid, repeatable, objective, and cost-effective method to verify that all of the NSRS coverage requirements are met.

This CATP is in conformance with the Telecommunications Industry Association (TIA) Telecommunications Systems Bulletin TSB-88.3-D titled “Wireless Communications Systems - Performance in Noise and Interference-Limited Situations - Recommended Methods for Technology-Independent Modeling, Simulation, and Verification”. TSB-88-D has defined Channel Performance Criterion (CPC) as the specified minimum design performance level in a faded channel, and provides a set of Delivered Audio Quality (DAQ) CPCs that define subjective voice quality performance applicable to both analog voice and digital voice systems.

TSB-88.3-D also defines a service area as a boundary of the geographic area of concern for a user, and states that Validated CPC Service Area Reliability shall be determined by the percentage of test locations in the bounded service area that meet or exceed the specified CPC. Harris has proposed a Bounded Area design for the Nevada Shared Radio System as defined in TSB-88.3-D wherein coverage predictions are made out to the boundary of the defined service area and coverage is verified throughout the service area out to the boundary through the performance of a Validated CPC Service Area Reliability test.

RF coverage using this CATP is verified by measuring talk-in (portable to base) BER at all sites from a test unit located throughout NSRS’ defined bounded service area, and calculating the percentage of measurements that equal or exceed a specified BER from a portable radio required to support NSRS’ specified CPC of DAQ 3.4.

3.1 Setup

Harris’ TYPHON wireless testing system is utilized to measure BER. TYPHON connects to a base station at each site in the system and includes a GPS receiver to provide accurate time information for each measured data point and a computer with an internal clock that coordinates and records the test data.

Multiple TYPHON units are required. One TYPHON unit is mounted inside the test vehicle (standard passenger vehicle) with an external antenna mounted on the vehicle's roof. A portable radio is also installed in the test vehicle with its external antenna also mounted on the vehicle's roof. No other equipment is installed on the roof of the test vehicle. One TYPHON unit will be located adjacent to the base station receiver at each site. TYPHON will be connected to the BASE station of the channel under test. For portable outdoor coverage verification, the variable attenuator will be set to the appropriate level to account for portable body losses. Variable attenuator values are shown in Table 2 in Section 2.1.

Prior to taking BER measurements, each site must be audited to verify that the radio system is operating properly. The audits will verify the antenna configuration, the antenna installation, and the frequency of the test transmitter. Harris shall provide all test equipment necessary to perform the site audits.

Table 4 - Coverage Service Area, Body/Building Loss, and Attenuator Values

Service Area Definition	Description	Body Loss (dB)	Attenuator Value (dB)*
All Service Areas	Portable Outdoor	7 dB	7

* The actual Attenuator value, including Body Loss, will be determined prior to testing once the actual test vehicle and test set up configurations are finalized.

3.2 Data Measurements

With the test vehicle in motion[1] along the drive route, the portable in the test vehicle transmits the data sequences on a working channel, and measurements of this signal are collected with the TYPHON equipment at each site. The software in the TYPHON laptop computer will automatically measure and record the data sequences that will be used to determine the BER for each measurement point along the drive route.

[1] Vehicle velocity must be between 30-60 miles per hour dependent on the grid size to provide the maximum number of test sequences along the drive route and ensure a minimum of one test sequence per grid area.

The GPS time of the start and stop (ON and OFF) for each transmission, as well as the vehicle position for each transmission, will be recorded in the test vehicle TYPHON.log file. These start and stop times will identify the corresponding portions of the base station receive TYPHON.log file containing the valid data to be used in the analysis.

3.3 Data Analysis and Acceptance

As defined by Section 5 of TSB88-3, latest revision, we post-process all mean measurement data records collected from the drive test within the defined service area boundary, with data records recorded every 0.1-mile (typically) used in the final analysis.

Measurements that have a BER equal to or better than 2.6% are recorded as PASS; the remainder are recorded as FAIL. This acceptance criteria is for P25 Phase 2 operation. P25 Phase 1 operation will meet or exceed the system's Phase 2 coverage.

Harris will then calculate the ratio of PASS points to total number of points collected for the P25 system. The installed radio system coverage is deemed to meet the coverage requirements if, for each bounded service area in Table 5, the ratio of the number of PASS points to the total number of points in the service area equals or exceeds the minimum % Validated CPC Service Area Reliability acceptance criteria that is shown. If all three of the regions pass, the the NSRS Boundary passes.

Table 5 - Coverage Service Area, Service, and Acceptance Criteria

Service Area Definition	Description	% Validated CPC Service Area Reliability Acceptance Criteria
NSRS boundary, consisting of	**Portable Outdoor**	**69.5%**
Region 1	**Portable Outdoor**	**65.0%**
Region 2	**Portable Outdoor**	**67.5%**
Region 3	**Portable Outdoor**	**66.5%**
Nevada State Highways as customer defined	**Portable Outdoor**	**90.1%**

3.4 Results Presentation

The data records are plotted on a map showing the test grids, the areas tested and the test results. Different pen colors are used to show ranges of measured mean signal levels. A test report is also provided that summarizes the test results.

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

4. VOICE QUALITY SAMPLE TEST, PORTABLE

This Characterization Test Procedure (CTP) is used by Harris for verification of portable coverage based on the evaluation of Digital voice quality.

This CTP is in conformance the Telecommunications Industry Association (TIA) Telecommunications Systems Bulletin TSB-88.3-D, titled “Wireless Communications Systems - Performance in Noise and Interference-Limited Situations - Recommended Methods for Technology-Independent Modeling, Simulation, and Verification”. TSB-88-D has defined Channel Performance Criterion (CPC) as the specified minimum design performance level in a faded channel, and provides a set of Delivered Audio Quality (DAQ) CPCs that define subjective voice quality performance applicable to both analog voice and digital voice systems. These DAQ definitions are provided in Table 6.

Table 6 - Delivered Audio Quality Scale Definitions

Delivered Audio Quality	Subjective Performance Description
DAQ 5.0	Speech easily understood.
DAQ 4.5	Speech easily understood. Infrequent Noise/Distortion.
DAQ 4.0	Speech easily understood. Occasional Noise/Distortion.
DAQ 3.4	Speech understandable with repetition only rarely required. Some Noise/Distortion.
DAQ 3.0	Speech understandable with slight effort. Occasional repetition required due to Noise/Distortion.
DAQ 2.0	Understandable with considerable effort. Frequent repetition due to Noise/Distortion.
DAQ 1.0	Unusable, speech present but unreadable.

TSB-88-D also defines a service area as a boundary of the geographic area of concern for a user, and states that Validated CPC Service Area Reliability shall be determined by the percentage of test locations in the bounded service area that meet or exceed the specified CPC. Harris has proposed a Bounded Area design for the NSRS as defined in TSB-88-D wherein coverage predictions are made out to the boundary of the defined service area and coverage is

verified throughout the service area out to the boundary through the performance of a Validated CPC Service Area Reliability test.

Portable coverage using this CATP is characterized by evaluating the voice quality of Digital voice test calls to/from a portable radio at test locations in a random sample of 10% of NSRS' defined urban service area. At each test location, a test call is placed from the portable user to the dispatcher (an inbound call), as well as from the dispatcher to the portable user (an outbound call). The inbound and outbound test call at each location is graded using the DAQ definitions in Table 6.

4.1 Test Equipment and Preparation

Portable radios as proposed and from NSRS' original order will be used for the voice quality test.

Prior to performing the tests, each site must be audited to verify that the radio system is operating properly. The audits will verify the antenna configuration, the power into the antenna, the antenna installation, and the frequency of the test transmitter. Harris shall provide all test equipment necessary to perform the site audits.

4.2 Characterizing of Test Locations

The Digital voice quality test requires two representatives from each entity (Harris and NSRS). One representative from Harris and one from NSRS will be the Field team, which will travel the drive route, perform the inbound calls, and grade the outbound calls. The second representatives from Harris and NSRS will be the Base team, which will remain at the dispatch location, grade the inbound calls, and perform the outbound calls.

To reduce the time required for this coverage test, a single Base team can support multiple Field teams, and multiple Field and Base teams may be used.

The Digital voice test calls within each grid consist of a short message representative of typical public safety call duration and include the identification of the location being tested. The suggested inbound test message is "TESTING GRID NUMBER XXX", followed by a short sentence or two from a newspaper or periodical such as "USA Today". To ensure that the message is understood, the dispatcher then repeats the inbound test message. The dispatcher will then make a similar outbound test call. The suggested outbound test message is

"CONFIRMING GRID XXX", followed by a different short sentence or two from a newspaper or periodical such as "USA Today". The field team will then repeat the dispatcher's test message. Within each grid, if the message is not understood on the first attempt, it can be repeated one time. Dependent on the size of the test grid and the vehicle speed, the test vehicle can be driven through the test grid a second time and the voice quality test call repeated.

Each of the four representatives grades the test call using the Table 6 DAQ definitions and records the test score for each test location using the template in Table 7. PASS or FAIL determination is made separately for the inbound and outbound calls at each location. For each call direction, a test location is deemed to PASS if it meets or exceeds NSRS' requirement for DAQ 3.4 voice quality from both graders. If both graders agree that the voice quality does not meet the defined DAQ 3.4 criteria, then that test location fails for the direction being graded. If a score differs between testers at a location that results in a failing score from only one tester, that location will need to be tested again to determine the cause of the discrepancy. If the discrepancy cannot be rectified, then that grid will be set aside for discussion and evaluation.

4.3 Test Analysis and Acceptance

The data logged by the four representatives on the grading template is then analyzed to determine whether the individual test grid meets the DAQ 3.4 definition.

4.4 Results Presentation

A test report is provided that includes:

- The number of test grids
- The location tested within each grid
- A copy of the Table 7 inbound or outbound grading template used by each grader

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

Table 7 –Portable Coverage

Voice Quality Test Grading Template

Coverage Test Data for: Nevada Shared Radio System Date: _____

Requirement: DAQ 3.4

Building Loss Attenuator Value: N/A dB

Portable Attenuator Value: ____ dB

Check the link used: ☐ Digital Voice ☐ Base to Portable (outbound)

☐ Portable to Base (inbound)

Harris Evaluator:	NSRS Evaluator:
Organization:	Organization:
Test Radio:	Test Frequency:

Service Area Test Grid Number	Harris Grade	NSRS Grade	Remarks

(One row for each test grid/location)

5. *PORTABLE INDOOR VOICE QUALITY TEST*

This Acceptance Test Procedure (ATP) verifies portable indoor coverage in mandatory buildings based on the evaluation of Digital voice quality.

This ATP is in conformance the Telecommunications Industry Association (TIA) Telecommunications Systems Bulletin TSB-88-D, titled “Wireless Communications Systems - Performance in Noise and Interference-Limited Situations - Recommended Methods for Technology-Independent Modeling, Simulation, and Verification”. TSB-88-D has defined Channel Performance Criterion (CPC) as the specified minimum design performance level in a faded channel, and provides a set of Delivered Audio Quality (DAQ) CPCs that define subjective voice quality performance applicable to both analog voice and digital voice systems. These DAQ definitions are provided in Table .

Table 8 - Delivered Audio Quality Scale Definitions

Delivered Audio Quality	Subjective Performance Description
DAQ 5.0	Speech easily understood.
DAQ 4.5	Speech easily understood. Infrequent Noise/Distortion.
DAQ 4.0	Speech easily understood. Occasional Noise/Distortion.
DAQ 3.4	Speech understandable with repetition only rarely required. Some Noise/Distortion.
DAQ 3.0	Speech understandable with slight effort. Occasional repetition required due to Noise/Distortion.
DAQ 2.0	Understandable with considerable effort. Frequent repetition due to Noise/Distortion.
DAQ 1.0	Unusable, speech present but unreadable.

TSB-88-D also defines a service area as a boundary of the geographic area of concern for a user, and states that Validated CPC Service Area Reliability shall be determined by the percentage of test locations in the bounded service area that meet or exceed the specified CPC.

RF coverage using this ATP is verified by evaluating the voice quality of digital voice test calls to/from a portable radio in each of the mandatory buildings (bounded service areas) specified by NSRS. In each building, test calls are placed from the portable user to the dispatcher (an inbound call), as well as from the dispatcher to the portable user (an outbound call). The inbound and outbound test calls in each building are graded using the DAQ definitions in Table . Scores that equal or exceed NSRS’s specified CPC of DAQ 3.4 are considered acceptable (PASS), and those lower than DAQ 3.4 are not acceptable (FAIL).

5.1 Test Equipment and Preparation

Portable radios as proposed and from NSRS’s original order will be used for the voice quality test. Prior to performing the tests, Harris will bench test and align all portable radios to be used during coverage testing. The portable radio will be worn on the belt and equipped with a shoulder-mounted speaker/microphone.

Prior to performing the tests, each site must be audited to verify that the radio system is operating properly. The audits will verify the antenna configuration, the power into the antenna, the antenna installation, and the frequency of the test transmitter. Harris shall provide all test equipment necessary to perform the site audits.

5.2 Test Planning

TSB-88.3-D recommends coverage verification at a statistically significant number of random test locations, uniformly distributed throughout the service area. To accomplish this, each mandatory building (bounded service area) is divided into a grid pattern as an aid to test planning.

An equal number of points on each floor, excluding basements, of each mandatory building will be tested. Each floor will be divided into 20-ft by 20-ft grids to obtain a uniform distribution of 100-200 grids in each mandatory building. A minimum of 20 test grids is required for small, single floor mandatory buildings. The voice quality test is conducted using portable radios near the center of each building test grid.

Test grids will exclude elevators. Harris and NSRS will mutually agree and identify other areas of each mandatory building that will be excluded from testing such as locations where RF signals are not permitted due to potential interference with sensitive electronics equipment, and areas where access is denied. Test grids that are within excluded areas of a building will not be tested and will be disregarded in the data analysis.

5.3 Grading of Building Test Locations

The digital voice quality test requires two representatives from each entity (Harris and NSRS). One representative from Harris and one from NSRS will be the Field team, which will travel the drive route, perform the inbound calls, and grade the outbound calls. The second representatives from Harris and NSRS will be the Base team, which will remain at the dispatch location, grade the inbound calls, and perform the outbound calls.

To reduce the time required for this coverage test, a single Base team can support multiple Field teams, and multiple Field and Base teams may be used.

At each agreed upon test location within a building, the portable user to dispatcher (inbound) and the dispatcher to portable user (outbound) test calls are performed. Per TSB-88-D, if the message is not understood on the first attempt the portable user is allowed to move 3-feet in any direction and the test can be repeated one time. The voice quality test is then repeated at each test grid within the building.

The digital voice test calls at each location within a building consist of a short message representative of typical public safety call duration and include the identification of the building and location being tested. The suggested inbound test message is “Mobile Team to Dispatcher, Testing Grid Number XXX”, followed by [Random Test Language], Grid Number XXX, how do you copy Grid Number XXX?” The dispatcher will then make a similar outbound test call. The suggested outbound test message is ““Dispatcher to Mobile Team, Testing Grid Number XXX”, followed by [repeated Random Test Language], Grid Number XXX, how do you copy Grid Number XXX?” Within each grid, if the message is not understood on the first attempt, it can be repeated one time. If a repeat (2nd PTT) test call performed within the grid is scored as a PASS, it will be annotated on the **Error! Reference source not found.** grading

template as a PASS-RETRY. If the second attempt to communicate fails (no access or audio quality below the required DAQ level), that test grid will be remain scored as a FAIL.

The [Random Test Language] to be used shall be mutually agreed upon between NSRS and Harris prior to testing. NSRS shall provide a list of potential test messages representing commonly used dispatch language, void of acronyms, and not to exceed 10 seconds in length, for evaluation. From the potential list of messages, one hundred shall be selected as the pseudo-random messages to be used for testing purposes. The phrase to be used during each test will be determined by the speaker. The final list will be determined prior to testing.

Each of the four representatives grades each test call using the DAQ definitions and records the test score for each test location using the template. PASS or FAIL determination is made separately for the inbound and outbound calls at each location. For each call direction, a test location is deemed to PASS if it meets or exceeds NSRS's requirement for DAQ 3.4 voice quality from both graders. If both graders agree that the voice quality does not meet the defined DAQ 3.4 criteria, then that test location fails for the direction being graded. If a score differs between testers at a location that results in a failing score from only one tester, that location will need to be tested again to determine the cause of the discrepancy. If the discrepancy cannot be rectified, then that grid will be set aside for discussion and evaluation.

NSRS reserves the right to begin testing anywhere within the building, i.e. the four corners (N, S, E, W) and the center of the building. NSRS also reserves the right to decide not to test all planned test grid locations within a building as well as the right to PASS a building in which NSRS has determined sufficient testing has been performed to verify coverage is acceptable within the building even if testing in all grid locations has not been completed. Any such grid locations within a mandatory building that are not tested will be recorded as a PASS in the template and the building will be recorded as a PASS on the template and in the final test report.

5.4 Individual Mandatory Building Test Analysis

The data logged by the four representatives on the grading template is then analyzed to determine whether the individual test grid meets the DAQ 3.4 definition.

An individual test grid location within a building is determined to PASS if both the inbound and outbound calls at that location have been scored as a PASS.

The building being tested is deemed to meet the digital voice quality coverage requirement if the percentage of test grid locations that receive a PASS score equals or exceeds NSRS's specified acceptance criteria, shown in Table 9.

All mandatory buildings will be tested. If Harris is denied access to a mandatory building to perform coverage acceptance testing, then that building will be scored as a PASS. NSRS may elect not to test all mandatory buildings, and any buildings thus not tested for convenience will likewise be recorded as a PASS.

Table 9 - Coverage Service Area and Acceptance Criteria

Mandatory or Critical Required Building	Maximum Building Loss (dB)	% Validated CPC Service Area Reliability Acceptance Criteria
FedEx Mustang Rd	18	95%
VA Hospital	18	95%
Red Rock FS	18	95%
Renown Medical Center	18	95%
Nugget Casino	18	95%
Mendive Middle School	18	95%
Sparks PD	18	95%
Ed Van Gorder School	18	95%
Stewart Facility	18	95%
Belrose Office Building	18	95%
Rawson-Neal Hospital	18	95%
Grant Sawyer	18	95%
AG Office	18	95%
Welfare & Support Services	18	95%
Department of Taxation	18	95%
Richard Bryan Building	18	95%
DHHS	18	95%
DMV	18	95%
NDOT HQ	18	95%
NDOT Hot Springs Annex	18	95%
State Capital building	18	95%
Legislature Building	18	95%
Ohm Service Center	18	95%
GOB	18	95%
Beltway Service Center	18	95%
Ryan Service Center	18	95%
Pearson Building	18	95%

5.5 Test Acceptance

Each mandatory building is evaluated separately. If the building's Voice Quality test meets the specified % Validated CPC Service Area Reliability Acceptance Criteria, the building passes.

If a mandatory building does not meet the coverage acceptance requirements, then additional tests will be made to determine if the loss characteristics of the failed test grid locations within the building exceed the maximum building loss specified below. If the measured building loss at a failed test grid is less than or equal to the County's specified maximum building loss, then the test grid will remain recorded as a FAIL. If the measured building loss for the test grid is greater than the County's specified maximum building loss, then that test grid will be discarded. The PASS/FAIL determination for the building is then recomputed discarding all test results that have a measured building loss greater than the specified building loss.

5.6 Building Loss Measurement Procedure

If a building fails the BER test, Harris will measure and compare the signal strength inside the building to an on-street signal strength measurement, using Harris' TYPHON or Storm wireless testing system. Measurements will be taken both immediately around the building as well as inside the building in a small area centered on each failed test location. The building loss at a test location is defined as the difference between the mean of the outside measurements minus the 95th percentile of the inside measurements at the failed test location. The 95th percentile is the signal level that is exceeded by 95% of the measurements.

5.7 Results Presentation

A test report is provided that includes:

- the name and location of each mandatory building
- the number and location of individual test grids within each building
- the identification of excluded areas/grids within each building
- a copy of the **Table 10** inbound or outbound grading template used by each grader for each building
- the % PASS/FAIL score for each building
- a statement of overall test acceptance or failure of coverage for NSRS.

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

Table 10 –Portable Indoor Coverage

Voice Quality Test Grading Template

Coverage Test Data for: Nevada Shared Radio System Date: _____

Requirement: DAQ 3.4

Building Loss Attenuator Value: N/A dB

Portable Attenuator Value: ____ dB

Check the link used: ☐ Digital Voice ☐ Base to Portable (outbound)

☐ Portable to Base (inbound)

Harris Evaluator:	NSRS Evaluator:
Organization:	Organization:
Test Radio:	Test Frequency:

Service Area Test Grid Number	Harris Grade	NSRS Grade	Remarks

(One row for each test grid/location)

Project Implementation Plan

Harris provides radio communication systems that support critical public safety operations, fulfilling the specific needs of its customers. The flowchart below shows the steps necessary to deliver a radio system that will replace the Washoe County's legacy system.

The implementation of such a large system will be completed in a phased, or regional approach. Each region will be handled as its own system, but with maintained focus on the interdependencies with surrounding regions and/or systems. A design period occurs first for the entire statewide system. Then the equipment for WASHOE COUNTY will be staged, installed, tested and cutover, region by region until the entire state-wide system is complete. The regions overlap to optimize the schedule and are staggered in time to optimize resources.

Design Reviews

Kick-Off Meeting and Preliminary Design Review

The project manager initiates project implementation with a Project Kick-Off Meeting, followed by a Preliminary Design Review. The Harris Team and WASHOE COUNTY will mutually agree on the timing of these meetings. The objectives of the meeting include:

- Introduction of all project participants
- Review of the roles of the project participants
- Review of the overall project scope, objectives, and deliverables
- Review of the current site status
- Review of WASHOE COUNTY owned site documentation
- Review status of WASHOE COUNTY site acquisition efforts, where applicable
- Review of the preliminary schedule
- Schedule detailed site surveys with WASHOE COUNTY, and/or site owner designated representatives.

- Following site surveys, the project schedule will be updated to reflect actual site conditions. The updated schedule will also account for site accessibility conditions during the winter months
- The project schedule will also reflect updated billing milestones
- Review progress of Microwave Upgrade
- Review Greenfield site development.
- Establish the communication methods, main POC's from each party

After the Kick-Off meeting, the Team will conduct detailed site surveys with WASHOE COUNTY. Harris will present the results of the detailed site surveys at the Preliminary Design Review Meeting.

Detailed Design Review (DDR)

The Harris Team uses the information obtained during the Kick-Off Meeting, Preliminary Design Review, site surveys, and regulatory and engineering documentation to deliver the final system design at the DDR. This will be defined on a per region basis.

The Harris Team presents rack elevation drawings, antennas placement drawings, antenna system drawings and documentation and all acceptance test plans during the DDR with WASHOE COUNTY. SOW Exhibit 3 contains the Responsibility Matrix for the DDR phase of the project.

Manufacturing and Staging

Immediately following WASHOE COUNTY's approval of the final design, the Harris Team procures material and schedules System Integration and Test using its Material Requirements Planning (MRP) system for the first region. Harris' Eagle Focus Factory assembles the RF equipment, integrates it with the key supplier items, and then tests each rack of equipment.

After assembly and test, each RF site rack will go through configuration, which consists of loading customer specific parameters and personalities into each applicable piece of equipment. The Network Switching Center (NSC) will undergo an imaging process. After imaging is complete, a Staging technician will perform a build and validation check against the NSC image.

Staging technicians position the racks of equipment under factory Staging halos. The Staging technicians make all network connections for each site's equipment including RF, NSC, dispatch, interop, and other site types. Ethernet and/or fiber cable connections are made to simulate backhaul networks and ensure the equipment connects to the network switches. The Staging Team programs radios to operate on a test user database programmed into the system during the NSC imaging process. The Staging Team verifies system levels and tests all features to confirm the system is ready for Factory Acceptance Test (FAT). Once a dry run FAT is completed by the Staging Team, the system transitions over to the system engineer for a week-long dry run of the FAT. During the following week, WASHOE COUNTY will visit the Eagle Focus Factory for a facility tour, introduction to the staged system, and to formally witness the FAT. The System Integration and Test responsibility matrix shown in SOW Exhibit 3 provides the staging activities that the Harris Team is responsible for and those activities that are the responsibility of WASHOE COUNTY. Each region of the State system repeats the manufacturing, staging, and FAT processes to meet the dates on the project schedule.

Shipping, Warehousing, and Inventory

After a successful Factory Acceptance Test (FAT), the Harris Team packages all system elements using established procedures depending on the mode of transportation. The Team engages appropriate freight carrier services to deliver WASHOE COUNTY's regional equipment to the Harris warehouse location in the State of Nevada or other mutually agreed to location.

Subscriber equipment may ship with the region or separately as determined by the Harris and Washoe County Project Team in coordination with Customer Care.

SOW Exhibit 3 contains the Responsibility Matrix for the shipping and inventory activities that the Harris Team is responsible for and those activities that are the responsibilities of WASHOE COUNTY.

System Installation

The Harris Team develops the installation plan during the detailed design phases of the project and presents it to WASHOE COUNTY for review and approval. The installation plan includes equipment rack-up drawings, antenna location details, and installation procedures based on site surveys conducted by the Team, or designated subcontractors. The installation plan coordinates all activities of the project team, minimizing installation conflicts, and ensures that system

implementation proceeds efficiently. The project team takes great care to ensure minimal disruption to existing EDACS service when installing the new P25 system in existing equipment locations. Site equipment installations follow industry standards, including Harris Grounding and Lightning Protection. The Team reviews the installation work to ensure implementation of these standards.

Antenna Systems

A key aspect of the infrastructure equipment work is installation of the new P25 antenna systems. Installation of new antenna systems may occur on a newly constructed tower, existing towers in use by WASHOE COUNTY as part of their legacy radio system, or on existing towers that are not part of the legacy radio system. In the case of newly constructed WASHOE COUNTY-owned towers, antenna system installation is straightforward per the system design. For towers that are part of WASHOE COUNTY's legacy system, new antenna system installations must consider the location of the existing WASHOE COUNTY antennas, and the timing of their removal. Antenna system installation on existing towers that are not part of WASHOE COUNTY's current system are not impacted by the presence of legacy system antennas. However, WASHOE COUNTY must coordinate the location of the antenna systems on the tower with the tower owner when it is a leased site.

The Harris Team uses experienced tower crews to install the antenna systems. The antennas mount on side arm mounts and support the RF cables with transmission line hangers secured to the tower cable ladder. The cables have ground kits that will be installed at the top, at the bottom as the cable leaves the tower, and at the end of the ice bridge before the cable entry port. Where applicable, grounding kits will be installed in the middle every 75 feet, so that there is no more than a 75-foot gap between grounds. The tower crew runs coaxial cables down the tower cable ladder, and onto the ice bridge terminating just inside the cable entry port.

After installation, the Team sweeps the RF transmission lines and antennas with a calibrated Anritsu Site Master, or equivalent cable-testing device, on the appropriate frequency band(s) to ensure proper performance. The Team records the baseline test data and provides it to WASHOE COUNTY. A copy will remain on-site for future reference.

Infrastructure Equipment

Upon completion of the tower work, installation crews install the base-stations, and associated

equipment. The MASTR V P25 trunked stations and associated equipment typically mounts in 86-inch standard aluminum EIA 19-inch open-frame racks. The RF connections extend to the coaxial cables using appropriately sized jumper cables.

Harris assumes that WASHOE COUNTY-provided shelters will accommodate the height of these open racks and allow them to position to maintain the desired 36 inches of free aisle space (in front and in the rear). Racks and cabinets anchor to the floor using at least four anchor points. All racks will be installed in accordance to seismic zone 4 requirements.

Harris assumes that WASHOE COUNTY-provided shelters will have sufficient primary and back-up power systems. If shelters are found to have insufficient primary and back-up power systems during site surveys they will be priced through the change order process.

Once the infrastructure racks secure in place, we ground and connect them to power, and technicians verify proper levels and settings preparing the site for the acceptance test.

WASHOE COUNTY personnel and/or their representatives are given advanced notice to prepare for their participation in acceptance testing. The installation team records the alignment and test data and provides copies to WASHOE COUNTY. Copies of the individual site alignment and test data will be available at the sites. Installation crews also install and commission the network switches, dispatch consoles, logging recorders, alarm terminals, and other infrastructure equipment, per the detailed implementation plan.

SOW Exhibit 3 contains the Responsibility Matrix for antenna systems and infrastructure equipment, that is repeated for each region.

System Optimization

Upon installation of infrastructure equipment, the system engineer(s) works with the on-site technicians to optimize the equipment in preparation for acceptance testing.

- **Simulcast** – Each Simulcast cell, includes verify launch timing, verify timing drive test, iterative adjustments, repeat timing drive test (if required due to non-compliance to specifications), verify configuration, test voter, test network latency, verify network switches, and dispatch console operation.

- **Multisite** – Includes setting up site adjacency in the virtual network interface controller (VNIC), build roaming personality, drive test roaming and hand-off, and finalize roaming personalities.

Harris will conduct a preliminary Acceptance Test to determine that the systems are fully optimized and ready for the Acceptance Test with WASHOE COUNTY. SOW Exhibit 3 contains the Responsibility Matrix for those tasks to be performed during the System Optimization phase for each Region.

Fleet Mapping

Fleet Mapping is the process used by the Radio System Administrator (RSA) to define regions, agencies, and talkgroups. WASHOE COUNTY's administrators create agencies by assigning an identifier to each agency, creating one or more administrators for the agency, and defining the "pools" of resources for the agency. The Agency administrators organize and configure their users, subscriber units (mobile radios), and consoles.

Harris will rely on input and direction from WASHOE COUNTY and other Members in the development of the fleet map. The new fleet map can be a carry-over from the existing one used today, or this can be an opportunity to streamline and generate a completely new fleet map. Either way, the fleet map will contain:

- Talkgroup IDs
- Agency definitions based on Work Unit or Division
- Emergency actions to be taken when a user declares an emergency
- Encryption capability for either persistent encryption or toggling on/off
- Roaming capability amongst WASHOE COUNTY sites, as well as surrounding systems
- Scan Priority and lists

Defining fleet maps as early in the project as possible allows flexibility for WASHOE COUNTY and the Harris Team to deliver and utilize radios early in the implementation. The Harris Team will work with WASHOE COUNTY's staff to develop templates for user radio programming promptly. Each template will have the basic features and functions defined for a user radio and

user type (e.g. high-tier portable for public safety) such as talkgroups for their work department, control head displays, alias displays, and other information necessary for each user. In prior implementations, Harris customers benefitted by programming a small set of radios with the new fleet map templates. This approach affords them the opportunity to verify that a radio with the intended programming is really what is desired or make changes to only a small subset of users.

Once the project team finalizes and WASHOE COUNTY approves the fleet map and templates, Harris starts mobilizing adequate resources to ensure timely fleet mapping and radio programming. Given the added benefit that Harris radios support both the existing EDACS technology and the new P25 communication protocols, this step can and should be taken prior to the migration over to the new system. All finalized fleet map documentation and templates will be provided as part of the final as-built documentation.

Coverage Testing

After the project team completes installation in a region, coverage testing will be executed. The Coverage Acceptance Test Plan (CATP) provided in this contract is preliminary. A final CATP will be submitted to WASHOE COUNTY for approval at the DDR and again 30 days prior to starting the coverage test.
Harris will complete coverage tests in cooperation with WASHOE COUNTY representatives. These tests include automated BER testing and Delivered Audio Quality (DAQ) tests. Harris will provide the lab test reports indicating that the radios have been tested and confirmed to meet the bit error rate that is equivalent to the required DAQ 3.4 audio quality. Both inbound and outbound automated BER tests will be performed over the entire service area. The DAQ voice call testing will be sampled over 10% of the number of tiles in urban areas across Nevada.

Harris' CATP is in conformance with the Telecommunications Industry Association (TIA) Telecommunications Systems Bulletin TSB-88-D titled "Wireless Communications Systems - Performance in Noise and Interference-Limited Situations - Recommended Methods for Technology-Independent Modeling, Simulation, and Verification." TSB-88-D has defined Channel Performance Criterion (CPC) as the specified minimum design performance level in a faded channel and provides a set of Delivered Audio Quality (DAQ) CPCs that define subjective voice quality performance applicable to both analog voice and digital voice systems.

Harris fully complies with the Test Configurations section 6.5.D.5 of the Attachment 1 Scope of Services document. Coverage testing of a region will only commence after the components in that region have been fully tested at the system level.

Cutover & Migration Plan

Harris understands the importance of continuous end user communications for all personnel. These users should be focused on carrying out their duties and should not need to worry about what features their radio can support before, during or after the migration phase. The Harris strategy is to make the migration transparent to the end user by maintaining functionality throughout the migration process.

A safe and seamless transition from the current EDACS system to the new Harris P25 communication system is a critical advantage unique to the Harris solution. Safe means the transition over to the new system minimizes communications or system outages, while ensuring the safety for every user that carries a Harris radio. Seamless means that the expected functionality that WASHOE COUNTY uses every day is still available, while at the same time being complemented by the new functionality the VIDA system offers.

Harris fully understands that the migration plan is one of the critical components of the overall project. As such, the plans' goal is to meet the following objectives:

- Maintain reliable and stable mission-critical communications
- Complete, functional system deployment in a timely manner
- Integrate with existing systems
- Smooth transition from existing operations for users
- Definition of clear roles and responsibilities between Harris and WASHOE COUNTY
- Provide training for all users, administrators and service personnel

The implementation and migration of such a large system will be completed in a phased, or regional approach. Each region will be handled as its own system, but with maintained focus on the interdependencies with surrounding regions and/or systems. The regions will be installed, tested and activated one by one until the entire statewide system is complete. As regions are

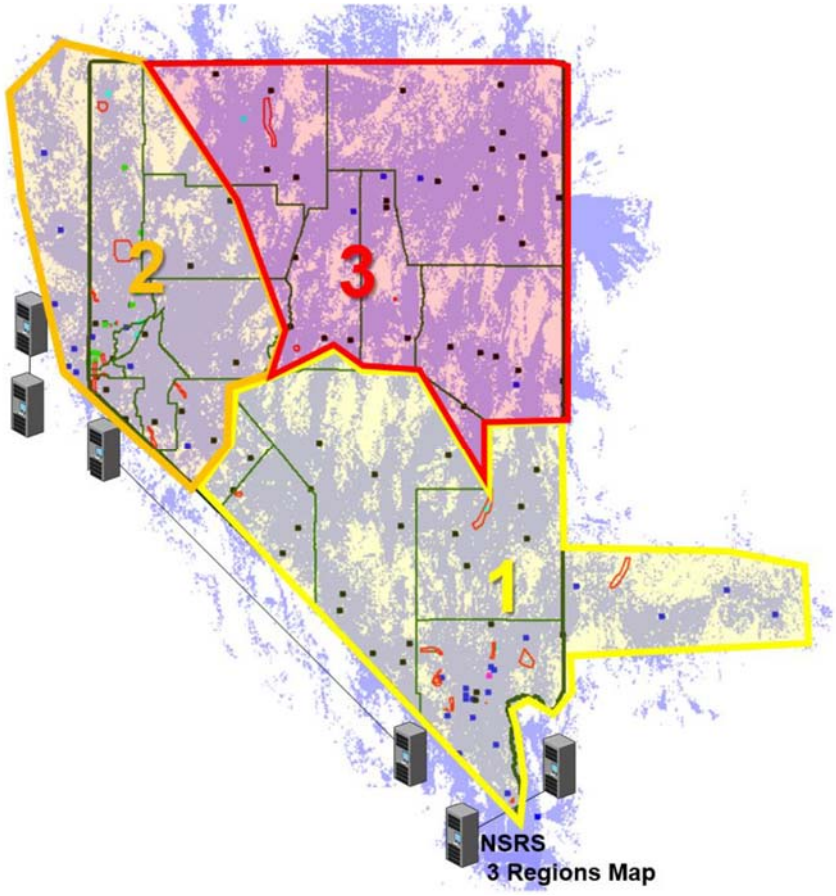
completed, WASHOE COUNTY agencies can be cutover for operational use. Figure 1 shows the preliminary regional breakdown. This plan is flexible and can be adjusted to WASHOE COUNTY's needs.

Harris will provide a detailed migration plan to WASHOE COUNTY at the Detailed Design Review. The final migration plan will detail the dispatch installation, migration phases, radio fleet transition, and details the site by site floor plans showing before, during, and after transition arrangements. Planned system outages will also be covered in the plan, with the goal of minimizing or mitigating any from being required. WASHOE COUNTY will have a single point of contact and a backup for technical and logistical communications.

The plans presented to each Member will be very similar in nature, though the scope may change slightly depending on the encompassed entities within the defined boundary. Each plan will detail the fallback procedures should it be necessary to pull back off the P25 system. With proper planning and upfront communication, this event is unlikely to occur. One of the added benefits of the regional approach is that the scope of such an effort is smaller and can be refined as information and lessons learned are gained from earlier region's implementations.

Harris will work with WASHOE COUNTY on migration coverage areas, especially along regional borders, to ensure that WASHOE COUNTY's coverage needs are met prior to cutover and are aligned with expected coverage during the design. The individual agency cutover timelines will be dependent on the new coverage footprints being operational.

Figure 1. NSRS Regional Map



Harris implementation teams have been very successful in cutting over new systems. This is attributable to proper planning and execution by both the project team and the customer. Tools to achieve this include:

- Dedicated project team assigned to WASHOE COUNTY project implementation
- Developing a solid cutover plan between Harris and WASHOE COUNTY
- A customer-focused collaboration during the planning phases to build consensus and buy-in from user groups
- Mobilizing adequate resources to ensure timely fleet mapping and radio programming
- Providing seamless communications between the legacy system and the new infrastructure (i.e. use of the EDACS Migration Gateway outlined below)
- Continual dialogue and cutover support to address user concerns

Experience shows that when the user community is fully involved and can ask questions and voice concerns, the cutover experience is much more efficient with greater end-user acceptance. From the program's start, through fleet mapping and user training, the local Harris team works directly with WASHOE COUNTY's project team to capture concerns, answer questions, and modify the final plan to suit each user's needs.

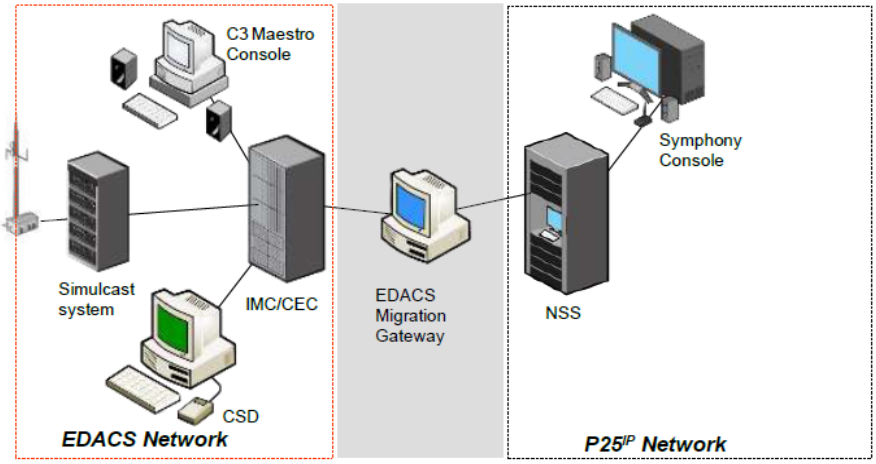
Throughout the transition process, the Harris team will monitor the system and respond to every reported communication incident. This methodical and detailed process provides the highest level of quality and oversight throughout the transition and cutover needs.

Migrating to the Power of IP

Many of WASHOE COUNTY's radios are capable of both EDACS and P25 modes, including Phase 1, with potential upgrade to Phase 2. Harris is providing WASHOE COUNTY with free EDACS software on any new P25 radios purchased as replacements for those radios that cannot operate on P25 as part of the system offering. The existing EDACS system will remain online and provide the existing coverage during the migration. As users are cutover to the new system, they will require reach back capability to the legacy EDACS system. Powered by the EDACS Migration Gateway (EMG), the Harris solution will provide full integration between the existing EDACS system and the P25 Phase 2 system. Unlike traditional gateways, the EMG is the only solution that can pass the following features from EDACS users to P25 users during migration:

- Full range of P25 & EDACS IDs
- Transmission trunked group calls
- Patch and simulselect
- Emergency indicators/clears
- Caller IDs across the two systems
- Pre-empt EDACS calls from the Symphony consoles
- Encrypted call support
- Individual calls

A network diagram for the EMG is shown below. The EMG provides a suitable migration tool for maintaining interoperability with legacy EDACS systems via the latest VIDA network technology. Providing dispatch connectivity to both systems using a single screen and single headset, to listen to both systems, is a critical advantage of the Harris system during the transition period. With the provided dispatch configuration, the Harris Symphony console dispatches over both the existing EDACS network and the new P25 network. Dispatchers see full information and have full control over both networks from a single console.



Harris will be responsible for designing and implementing Washoe County's IP-based microwave system and integrating it with the other NSRS members back-haul network.

Key Components of the Migration

Harris' primary goal for migration is to make the transition as transparent to the end user as possible by maintaining functionality throughout the migration process. Whether a user needs their Harris radio for administrative use or emergency response, the operational requirements they meet to perform their job will be enhanced on the Harris P25 system. The migration and cutover plan laid out in the following sections highlights the Harris strategy for each facet of the design, providing a summary of the strategy for each of the various subsystems in WASHOE COUNTY's portion of the NSRS P25 system. The following table identifies the RF sites in accordance to their assigned region.

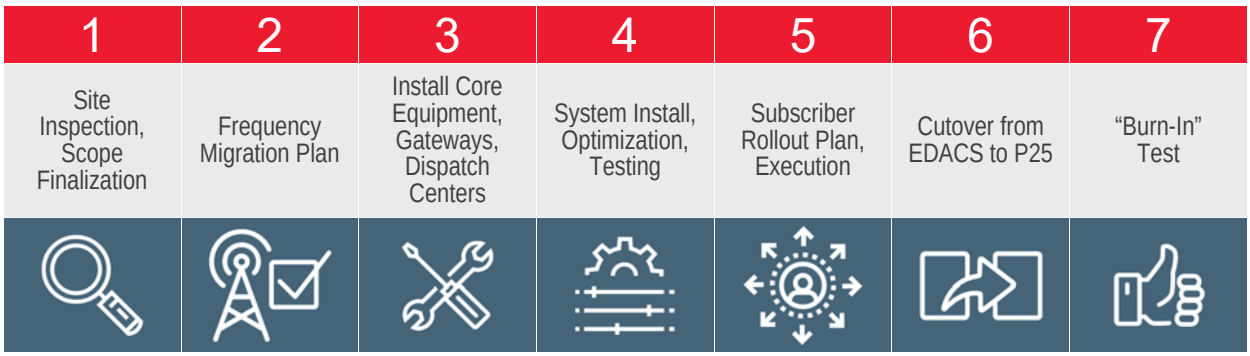
Region 0 RF Sites (Pilot Region)			
E/Cheyenne	E/Durango	E/Beltway RF	E/Decatur P25
E/Westside	E/Cabana	E/Sloan P25	E/Washington P25
E/Angels P25	E/Ryan Center		

Region 1 RF Sites			
E/Blue Diamond	E/Reid Gardner	E/Pipe Springs	D/White River P
E/Christmas	E/Silerhawk	E/Buckskin	D/Highland Peak
E/Big Horn	E/Apex	E/Page	D/Wilson
E/Laughlin	E/Lenzie	D/Coyote Springs	D/Sunnyside
E/Opal	E/Glendale	E/Pahranagat	D/Timber
D/Hoover Dam	D/Ragged Ridge	D/Alamo	D/Warm
E/Potosi	D/Mesquite	D/Irish	D/Fitzpatrick
E/Red Mountain	E/Beaver Dam	D/Caliente	D/Pilot Peak
D/Mercury	D/Schader	E/Indian Springs	D/Deer Creek
D/Red Rock	D/Millers	D/Brock	D/Palmetto
D/Sawtooth	D/Tempiute	D/Montezuma	D/Sober
D/Amargosa	D/Mt Charleston		

Region 2 RF Sites			
D/Kinkaid	E/Muller	W/Tahoe SC	W/Marble Bluff
E/TV Hill	D/Spooner Summit	E/Ophir	D/Toulon
D/Pinegrove	E/Pinenut	E/High Camp	W/Poito
W/Snowflake	D/Eagle Ridge	E/Alder Hill	W/Truckee 18
D/Bald West	D/Painted Rock	E/Beckworth	E/Likely
W/Biltmore	D/USA Highway	W/Chimney Peak	W/Fox

D/Fairview Peak	E/Patrick	W/Peavine	W/Fortynine Mt
D/Hot Springs	W/Slide	W/Red Peak	W/Yellow Peak
D/Wildoat Mt	W/Smokey Quartz	W/Virginia Peak	E/Fencemaker
D/Imlay	D/New Pass		

Region 3 RF Sites			
D/Mt Moses	E/Connors Pass	D/Peavy Hill	E/Chevas
D/Mt Austin	D/Border Inn	D/HD Summit	D/Penn Hill
D/Prospect Peak	D/Victoria	D/Jackpot	E/Argenta
D/Buster Mountain	D/Spruce	D/Ellen Dee	D/Golconda
D/Currant Summit	D/Secret Pass	D/Elko Mountain	D/Winnemucca Mountain
D/Kimberly	D/3 Mile	E/East Twin	D/Trident Peak
D/Squaw Peak	D/Loray	D/Emigrant	D/Double H
D/Cave Mountain	D/Rocky Point	D/Mary's	D/Hickison
D/Flat Creek			



Stage 1 – Site Inspection and Scope Finalization

Harris' design approach uses as many of the existing sites in the current system as possible. There will be additional sites required as well. Harris outlines our site development and site equipment costs critical to support the P25 system in the pricing pages. We will finalize these costs from site surveys, and collected quotes from local contractors to perform the expansion work. Equipment installation are dependent on-site readiness and weather conditions, and will be determined after site surveys.

Harris' solution accounts for these intrinsically challenging upgrades and new installations. The efforts require coordination, planning, and risk mitigation. Harris understands these efforts and is uniquely positioned to tackle them in this upgrade. After project kick-off, Harris will start this process with the following critical activities to inspect sites, finalize scopes, and complete the Detail Design Review.

- Schedule site surveys with WASHOE COUNTY
- Perform structural analysis on the existing antenna structures to determine the capabilities to support the P25 antenna design loads
  - Any underperforming towers will require detailed costs from Harris to remedy the tower, and an additional change order and approved engineering drawings before antenna mounting work may proceed
- Perform an electrical load study at each site to determine the spare load available in the local panel. This information will inform the final Harris load transition plan to support the DC Power upgrade from the legacy system to the new P25 system.
  - Identified additional power needs will result in a change order and possible delays at the site.

- Finalize the physical rack and antenna installation plan given the constraints imposed by the RF equipment space.
- During site survey inspections the Harris team will identify and document any site upgrades that are required or recommended to support the new P25 system. During the DDR the Harris team will work with WASHOE COUNTY to finalize site civil requirements and submit a change order documenting the final site designs.

Below are the recommended site civil requirements to support the new P25 communications system. Following site surveys Harris will submit a report identifying required site upgrades, upon WASHOE COUNTY's approval a change order will be submitted to complete the necessary upgrades

Site Name	48 VDC Plant Current	Back-up Generator	Space Available for TX Antenna	Space Available for RX Antenna	Space Available for # Racks	Dual HVAC
Fox WCRCS	96 amps	25 KW	35 Ft	50 Ft	3 racks	1.5 ton
Poito - WC	157.5 amps	30 KW	55 Ft	70 Ft	6 racks	2.5 ton
Tahoe SC - Biltmore	140.7 amps	30 KW	45 Ft	45 Ft	3 racks	2 ton
Tahoe SC - Snowflake	140.7 amps	30 KW	55 Ft	55 Ft	3 racks	2 ton
Slide WCRCS	200.2 amps	30 KW	105 Ft	120 Ft	4 racks	3 ton
Rose WCRCS	200.2 amps	35 KW	65 Ft	75 Ft	4 racks	3 ton
Red Peak - Metro SC	259.7 amps	40 KW	135 Ft	150 Ft	4 racks	4 ton

Site Name	48 VDC Plant Current	Back-up Generator	Space Available for TX Antenna	Space Available for RX Antenna	Space Available for # Racks	Dual HVAC
Peavine - Metro SC	259.4 amps	40 KW	85 Ft	100 Ft	6 racks	4 ton
Virginia Peak WCRCS	170.4 amps	30 KW	115 Ft	130 Ft	4 racks	2.5 ton
Marble Bluff WCRCS	170.4 amps	30 KW	115 Ft	132 Ft	4 racks	2.5 ton
Yellow Peak	81.2 amps	25 KW	80 Ft	100 Ft	3 racks	1.5 ton
Smokey Quartz	200.2 amps	30 KW	80 Ft	100 Ft	4 racks	3 ton
Red Rock	81.2 amps	25 KW	80 Ft	100 Ft	3 racks	1.5 ton
49 Mtn	66.3 amps	25 KW	80 Ft	100 Ft	3 racks	1.5 ton
Truckee Station 18	140.7 amps	30 KW	80 Ft	100 Ft	3 racks	2 ton

Stage 2 – Frequency Migration Plan

The process for developing a Statewide frequency plan is a long, intensive and often iterative process. Harris has taken the first step in developing a frequency plan for the P25 system by evaluating spectrum availability. Harris' goal is to reuse as many of WASHOE COUNTY's current spectrum holdings as possible while also looking to implement *additional channels* to provide for coverage testing and avoid impacting the EDACS users during the multi-year cutover period. A final and comprehensive frequency plan will be provided at the DDR. Harris will work to completely build out the P25 site alongside the existing EDACS sites, allowing for a smooth and logical cutover.

Harris plans to implement a phased, or regional, cutover, thus allowing the 800 MHz EDACS frequencies to be placed back into the P25 pool for reuse. This plan mitigates risk, and allows the new P25 system to be fully vetted, and loaded at WASHOE COUNTY's discretion. In addition, Harris will put forth the due diligence in determining the viability of using any available 700 MHz channels.
Harris will provide WASHOE COUNTY with a draft frequency plan before DDR. In addition to the plan, a report will be provided which substantiates the ability to license frequencies associated with the plan.

Finally, Harris' frequency plan mitigates these additional risks.

- Minimum of 250 kHz of channel separation within any sites' transmitter combiner
- Minimum of 50 kHz of channel separation between any channel assigned in overlap areas of the network
- No interference with existing system frequencies during the various migration phases

Stage 3 – Installation of Core Equipment, Gateways, and Dispatch Centers

New core equipment is being provided for WASHOE COUNTY, which gives Harris the ability to build out in parallel with the existing EDACS core, and move resources over to the new core while maintaining a connection back to the EDACS system via the EMG.

Harris will install the core equipment for all NSRS members during the rollout of region 0 allowing the Harris team to turn RF sites on as we move through the regions.

Once the new core is in place and connected to the microwave ring, Harris will make it operational and begin the testing of the new core. Other subsystems that will be installed in the system with the new core include:

- New Network Management System (NMS)
- EDACS Migration Gateway (EMG)
- New centralized Logging Recorder

These devices must be cutover to the new core prior to the transition of dispatch operations.

The migration plan includes steps to evaluate the maintenance or replacement of current gateways, or other interfaces to analog or non-P25 systems. This will prevent loss or degradation of connectivity during migration. Users on either the existing EDACS system or new P25 system will have access to all system resources prior to transition. Harris will work with WASHOE COUNTY to prevent loss or degradation of connectivity with outside agencies by determining what systems and interop agencies are critical to the operations within a region during the migration. This step is critical in terms of *risk mitigation*, allowing WASHOE COUNTY to maintain operation on the current EDACS system before any sites or dispatch consoles are moved to the new network.

DISPATCH MIGRATION

Harris understands the important role of the dispatcher regarding critical communications, and we developed our newest Symphony console to simplify dispatch operations and empower dispatchers. With console space restrictions in mind, Harris designed the Symphony console to require minimal space in already tight dispatch centers.

Harris installers will work with WASHOE COUNTY's Dispatch Centers to custom design their console screen layout to meet the individual dispatcher needs. Likewise, the Symphony console supports individual dispatcher login and personalization to provision dispatcher specific settings from the network so dispatchers can access their specific settings at any dispatch console location and not be tied to a specific workstation location.

With the EDACS Migration Gateway, dispatchers can access both P25 and EDACS talkgroups, allowing a seamless transition to the new system. As users transition to P25 from EDACS, dispatchers will be there every step of the way, leveraging their new dispatch consoles to operate both systems. The EMG provides the capability to operate all the scenarios outlined below:

- New Symphony Consoles dispatching on EDACS
- Existing Consoles dispatching on P25
- Backup control stations can also operate on both systems with multi-mode software
- Having both existing and new consoles in operation at the same time

A Harris technician or console trainer will be on hand during the cutover period as each shift begins to train the dispatchers on use of the new consoles. The guidance provided to the dispatchers will ensure a smoothly running operation. Dispatch consoles can be installed prior to or during migration thanks to the benefits the EMG provides.

Installing consoles in a 24-hour dispatch center requires consideration of minimum staffing as well as operational peak times. Harris will interview the dispatch center managers to identify downtimes, console availability and operational peak times to schedule console installs accordingly. Evening or weekend console installation can be scheduled as well, should WASHOE COUNTY feel it is beneficial to install consoles at non-peak operational times.

Realizing that operations must continue while consoles are being installed, console installations will occur using hand tools rather than power tools (as much as practical) to limit background noise in the dispatch center. Typical console installation requires approximately two to three hours per installer. Harris will provide additional installers as necessary to meet console availability and to install consoles at the allowable pace at each individual dispatch center.

Once up and running, dispatchers can transition to the new platform with proper training to *handle all operational requirements* including administration, day-to-day operations, emergency response, and how to handle catastrophic events on the new platform.

NEW NETWORK MANAGEMENT SYSTEM INTEGRATION

The new core equipment has its own built in network management platform. Harris *recommends system training* on the new platform to bring system administrators up to speed on the latest feature available. Once the core is in place, WASHOE COUNTY administrators can begin using the new Network Management System immediately.

Stage 4 – System Installation, Optimization & Testing

Once the VIDA core and dispatch capabilities are operational, Harris is ready to finalize the installation, optimization and cutover to the P25 system on a regional basis. Harris will install all P25 site equipment in parallel to existing EDACS equipment at existing facilities. Prior to commencing user cutover within a region, Harris will fully test and optimize the new system to ensure that all functional and coverage acceptance test plans have been completed, and the system is ready. This includes the completion and signoff of the Functional Acceptance Test Plan (FATP) and Coverage Acceptance Test Plan (CATP) procedures, per region. This critical step minimizes risk and ensures the region is ready for cutover.

Stage 5 – Subscriber Rollout Plan and Execution

Harris can safely move EDACS users over to P25 during the transition with a single radio device. This is accomplished using dual programming of both EDACS and P25 modes. All existing subscribers capable of P25 Phase 1 or Phase 2 operation can be upgraded and programmed ahead of the transition date. Harris strongly encourages WASHOE COUNTY to provide new radios to users that will be operating in a region before migration starts for that region. By orchestrating this programming effort ahead of the actual migration, radios can be fielded in advance to minimize disruption, and not require the need to pull users out of service. This also prevents users from having to carry two radios at any point during the transition. EDACS operators will continue to use their EDACS talkgroups all the way up to their transition date. For mobile users, their radios can be installed and programmed ahead of time, which limits how many users need to be taken out of service for the cutover date.

On their cutover date, users will be trained on how to switch modes on the radio, the differences between analog and digital modes of operation, and what talkgroups are available to them in P25 mode. This training will cover administrative use, day-to-day operations, how to handle emergency events, and what occurs on the radio in the event of catastrophic failures. Careful consideration of fleet mapping up front will minimize reprogramming efforts that can prove costly and timely for the users. The new fleet map structure will closely resemble the existing EDACS structure since primary EDACS talkgroups will be bridged to the same P25 talkgroups. Once on the P25 system, users will likely not know the difference between users that have transitioned, and those that haven't on their primary talkgroups.

The final radio procurement and upgrade plan will be finalized at Detail Design Review (DDR). Harris will work with WASHOE COUNTY to identify the number and type of existing radios they wish to upgrade, as well as the quantity of new radios they want to procure. Once these radio quantities are finalized, Harris will provide a detailed plan to accommodate the programming, training, install and removal of radios into the final migration plan. In general, Harris intends on using the EDACS migration gateway and mixed mode radios (i.e. radios that support both

EDACS and P25 operation) to provide a flexible and seamless migration.

Once an entire talkgroup moves to the new P25 network, the EMG talkpaths are available for the next talkgroup. Throughout the transition, legacy system users will always hear audio and see emergencies from those that are on the new P25 network and vice versa. Training will be provided in alignment with the migration plan to ensure each user is fully capable of operating the new radio.

User cutover within a region occurs once the new P25 network system is tested and accepted. Once ready for transition, Harris' strategy is to move radio users by functionality (public services, police, fire, etc.) but is flexible in their approach and looks forward to working with WASHOE COUNTY to finalize the plan. Throughout the transition, the Harris team will monitor the system and respond to communication incidents. With dual operation, fallback is seamless to the existing EDACS system.

User Radio Equipment Implementation

Harris will be responsible for programming and installing radios. The project team will coordinate the distribution of portable radios and accessories with WASHOE COUNTY. In addition, the project team will begin mobile installations for the initial group in concert with the training schedule. Technicians and subcontractors will equip vehicles with new mobiles in accordance with a schedule created by WASHOE COUNTY and mutually agreed upon by Harris. WASHOE COUNTY will direct vehicles to a regional installation area where old mobile radios will be swapped out for new mobile radios.

Technicians and subcontractors experienced with user radio operations will be available to answer any last-minute questions. Harris will ensure that the subcontractors perform the work to Harris specifications and that they leave the work area as it was found at the end of each day.

To identify the specific radios assigned to individuals and vehicles, the project team will provide Washoe County an inventory list of all radios, including serial numbers, calibration data, and radio programming information. The cutover team will work together to schedule the delivery of the radios to each user shortly before they go live on the new P25 system. As required, installations will consist of completely placed, anchored, and installed equipment, including the placement of associated cabling, appropriate layout, and full testing of the radio. Harris will

provide associated power supplies and any other hardware, adapters, and/or connections to deliver a complete operable user radio to WASHOE COUNTY at the time of field acceptance.

User Equipment

The Harris Team and WASHOE COUNTY personnel will develop a mutually agreeable cutover schedule. The Harris Team will provide overall management and planning of the installation and test activities, while its subcontractors perform the installations. The Harris Team will schedule and coordinate the user training and distribution of the portable and mobile user equipment per the cutover plan installation schedule. All mobile radio installations will be closely coordinated with WASHOE COUNTY and participating user agencies, to minimize disruption to their operation, and to reduce out-of-service and unproductive time.

Radio Installation Planning

Mobile Radio Installations*	Portable Radio Distribution*
Harris *Knows* mobile installs: ▪ Require extensive planning and coordination ▪ Remain with the vehicle for years ▪ Have a need for collaborative planning/continuous quality management = decreased end-user agency impact ▪ Can be accomplished ahead of cutover dates due to Harris' ability to support both EDACS and P25 modes of operation	Harris *Knows* portable distribution: ▪ Can occur concurrently with mobile installs, but ***encourages*** distributing ahead of time due to the capability of supporting both EDACS and P25 modes of operation ▪ And if the user's legacy radio is not a P25 Phase 1 or 2 capable radio, the user will turn it in and walk away with the new P25 Phase 2 radio(s) ▪ And if the user's existing radio is P25 Phase 1 or 2 capable, WASHOE COUNTY has the option to upgrade the radio to P25 Phase 1 or 2

*Harris will be responsible for updating each system users radio equipment to operate on the network before, during, and after system migration.

Stage 6 – System Cutover from EDACS to P25

Our migration solution installs the new system in parallel with the legacy system. All installations and verifications will complete prior to starting the migration. Therefore, Harris expects little downtime as users migrate from the EDACS system to the new P25 system because of the parallel systems approach. Momentary downtimes may occur when de-activating a frequency on the legacy system and activating that frequency on the new P25 system. However, as the frequency plan outlines, the new system only uses a small subset of channels from the legacy system. Harris expects to perform frequency migrations during off-peak hours during scheduled windows of time to reduce impacts.

With the EDACS Migration Gateway in operation, WASHOE COUNTY can migrate users to the new system as entire disciplines, while maintaining the legacy communication infrastructure if users need to switch back to the legacy system. Since critical communications between systems will support trunking features such as IDs and emergencies, end users will have constant communications between both the EDACS and P25 system so that they can still communicate with users that have not completed migration.

Harris will provide a detailed cutover plan as part of Detail Design Review, which will incorporate WASHOE COUNTY's suggestions for which regions should be upgraded first, the order of those regions, and traffic analysis outlining the results on both the legacy EDACS and new P25 system during each transition step.

Final Acceptance Testing

The Harris Team will perform systems acceptance testing per the agreed upon final acceptance test plan (FATP) for each region. The Harris Team will provide two weeks written notice to WASHOE COUNTY when installation and optimization are complete, the FATP has been fully dry-run successfully and the system is ready for acceptance testing. The following is a sample outline of Harris' FATP.

- Facility Test - Visual Inspection
- VIDA Universal Administration Server (UAS) Operation
- Encrypted Voice Operations
  - Single site, Multisite and Console encrypted group calls
  - Encrypted Individual (Private) Calls
- Over the Air Rekeying (OTAR)
  - Includes Rekeying and Changing Over a Crypto Net, plus Zeroing subscribers
  - Rekeying a Console
- Redundant Wide Area and High Availability Router Failover
- Site Activity using the Activity Warehouse
- VIDA Regional Network Manager
  - Reporting of RF System Alarm Indications
- Enterprise Network Manager (ENM)
- P25 Station Reconfiguration using the Device Manger
- NSS Switchover
- Control Point Movement
  - DCP Forced Control Point Movement
  - DCP Control Point Movement in response to Faults at the Active Control Point
- P25 Trunked Calls and Site Features
  - Includes Emergency calls, All-Call, Call Priority and Scanning
- Transcoder Operation
- P25 Phase 2 Functionality
  - Includes Mixed-Mode and standard call operation
- Symphony Dispatch Platform Features and Operation
  - Includes Emergency Calls, Pre-empt, Patching, Simulselecting, Console Cross-mute

- Trunked Logging Recorder Operation
- P25 Simulcast Bypass Operation
- VIDA Interoperability Gateway Tests

The system engineer provides documentation defining each of the test areas. The FATP procedures contain a short description, test methodology, and a record form for logging results and acceptance signatures for each test. The Harris Team uses a punch list to document any issues found, so the team can quickly resolve them. Follow-up tests and documentation will show the correction of open items. Upon satisfactory completion of each testing phase, the project manager will present the system acceptance documentation to WASHOE COUNTY's project manager(s). The project team and WASHOE COUNTY can proceed with cutover of a region with each approval WASHOE COUNTY provides.

SOW Exhibit 3 contains the Responsibility Matrix for Final Acceptance Testing activities performed by Harris, and those activities that WASHOE COUNTY will perform for each region.

Stage 7 – "Burn-In" Test

The new P25 radio system will undergo a 30-day burn-in period encompassing 30 consecutive days of uninterrupted operation following cutover. The 30-day burn-in period is intended to demonstrate reliable system operation. Several important aspects of the reliability test are to have no disruption in communication, and to have no reduction in the quality of communication. Failure modes, categories, and correction scenarios will be topics to be discussed.

Major failures might include items such as a complete loss of network switching capability, loss of wide area trunking mode operation, complete loss of simulcast control point equipment, etc. In general, a major system failure will result in the test period being stopped and restarted from zero after correction of the issue.

Minor failures could include any non-critical failures that don't affect trunking or system operation. In general, minor system failures do not result in testing being suspended. Minor system failures are added to an incident report tracking document and these items are addressed while reliability testing is on-going.

At the successful completion of the 30-day burn-in period, the project manager will arrange a meeting with the field service team to review maintenance support during the warranty period. The team will provide the contact information and procedures used to obtain service during the warranty period for standard business hours and after hours.

APPROACH

The Burn-in Period Test will be conducted once the System Acceptance Test Plan and Coverage Acceptance Test Plan have been successfully completed and users loaded on the system for that region. During the test, the region shall operate for a period of 30 accumulated calendar days without a major failure relating to hardware or software infrastructure. Neither the (Customer) nor Harris shall perform any system maintenance during the test unless mutually agreed upon in writing.

During the test, records of hardware and software failures will be collected, evaluated and resolved as required. The failures will be classified as a “Major System Failure”, an “Intermediate System Failure”, or a “Minor Failure” (as defined below in table 2). The test will be successfully completed upon the completion of a 30-calendar day period without the occurrence of a “Major System Failure”. Event failures could either stop and reset the cycle time, or temporarily pause the Burn-in Period test.

Harris and WASHOE COUNTY shall assign a primary and secondary point of contact which will be available at all times during active testing of the region. These contacts will comprise the “test committee”. Any in-process failures will be reviewed by both parties, a determination made as to the actions to be taken, and the effect on the test clock following the guidelines and definitions of failures below. During this time, all documented issues will be logged, evaluated, resolved and reviewed by the test committee.

MONITOR AND CONTROL

The Regional Network Manager (RNM) application will be used to monitor system health status. The Harris project engineering team will require VPN Remote Access to WASHOE COUNTY’s network in order to perform remote monitoring and diagnosis of the LMR System.

Site and terminal configurations will be locked during the Burn-in Period Test preparation. Any mutually agreed changes will be documented and become a part of the test report.

FAILURE DEFINITIONS AND SAMPLES

Figure 2. Failure Types

Failure Types	Description
Major/Critical	A Critical failure of the system during this test will cause the thirty (30) day burn-in period and warranty to reset and restart from the beginning after completion the repair. A critical failure is defined as follows: • Any failure which causes a loss of fifteen percent or more in capacity or coverage in any cell • Any failure which causes a loss of the primary core • Any failure which causes a loss of simulcast capability • Any system failure that causes the loss of two or more console positions • Any failure that renders the logging recorder inoperable or causes the irretrievable loss of recorded audio • The concurrent failure of two (2) or more repeaters • Concurrent failure of two (2) or more switches and/or routers • Failure of the receiver voting system • Two (2) or more repetitive minor failures of the same functionality with or without the same root cause
Intermediate	Defined as Harris supplied hardware or software failure which INTERRUPTS 30-Day Burn-in Period Test and will STOP testing. Harris and/or its authorized repair service will make the necessary repairs/adjustments, and the 30-calendar day test period will be re-started at the point that it was discontinued and will continue until the thirtieth day occurs without further interruptions. For example, if failure occurs on Day 15 of the reliability test, repairs will be made, and the Burn-in Period Test will restart and continue on Day 15. The Burn-in Period Test will then be deemed successfully completed when Day 30 is completed without further interruptions of failures.

Failure Types	Description
Minor	A minor failure will cause the burn-in period to temporarily hold until the issue has been fully resolved to the Members satisfaction. On approval, the burn-in period can resume. The Members will accept a maximum two (2) minor failures before a full reset of the burn-in period will be required. Two (2) or more repetitive minor failures of the same functionality with or without the same root cause shall be defined as a major failure. Two (2) or more of the same minor failure without the determination of cause will temporarily hold the burn-in test until a cause is found, confirmed and corrected, or the Members are satisfied there is little likelihood of a systemic recurring issue
Other	Defined as one or any combination of the following type of events considered out of Harris' Control: Radio call failures in "known" poor coverage areas, non-Harris customer provided equipment such as the backhaul, commercial power failures, customer staff/operator errors, previously agreed system maintenance downtime and/ or harsh environmental conditions or acts which cannot be prevented.

System failure definitions are shown in Figure 3.

Figure 3. System Failure Definitions

Item	Failure Description	Major	Intermediate	Minor
A	Complete Loss of Network Switching capability.	X		
B	Loss of wide area trunking mode of operation.	X		
C	Base station failure	X		
D	Loss of simulcast control point equipment.	X		
E	Failure of 20% or more dispatch console positions including control stations.	X		

Item	Failure Description	Major	Intermediate	Minor
F	A software failure or download or any intervention by a Harris software developer or programmer on the radio system infrastructure components resulting in a service outage that would otherwise be classified as a major failure.	X		
G	Failure of the radio system infrastructure to properly recognize the emergency alert from a terminal subscriber.	X		
H	Complete Loss of Network Management capability.		X	
I	Loss of more than ten percent traffic capacity of the user base.		X	
J	Failure of any single Network First Gateway interface equipment between the Gateway		X	
K	Any non-critical failure that does not affect trunking operation			X
L	Any user terminal equipment			X
M	Single Console position			X

Test Planning Procedures

Prior to the start of the 30-Day Burn-in Period Test, the following activities must take place:

- System Acceptance Test Plan completed
- xxxx users identified during DDD (full radio cutover completed for the region)
- User training completed
- Test Committee members identified
- Team meeting with users and test committee to review the test plan and failure definitions and examples

- Issue reporting process reviewed and approved

FAILURE REPORTING

Upon observing a system issue, the user will complete the Radio System Issue Report (Figure 4) and submit it to the test committee within 12 hours. Upon receipt of the issue report, the Harris representative will log the report and make a preliminary classification of the issue and report it to the Test Committee within 12 hours of receiving the report. Should the issue be classified a major failure, the test will be halted until resolved.

All reported issues will be logged documenting the details of the issue resolution. Should the initial classification be disputed by another member of the test committee, the committee will meet within 24 hours to review the issue and reach agreement on the classification. The test will continue until the team meets and reaches agreement.

In the unlikely event that the test committee cannot reach consensus on the issue classification, or restart of the test after a major failure, the Harris Project Manager and WASHOE COUNTY Project Manager will meet and discuss. If they cannot reach agreement, the test will resume and the issue will be referred to the Dispute Resolution Board.

Weekly meetings will take place to review the progress of the test, discuss issues identified and their resolution. Attendees of the meetings will include the Test Committee and others as identified by APS and Harris Project Managers. The Harris Project Manager will document and distribute meeting minutes and action items for each meeting.

Figure 4. WASHOE COUNTY P25 Radio System Issue Report Form

Name/User:				
Date:				
Time:				
Location:				
In Building (Y/N):				
GPS Coordinates:				
Agency:				
User ID:				
Talk Group/Channel:				
Selected System:				

Issue Description

Scheduled Maintenance or Intermediate Failure

Upon completion of the maintenance or resolution of the failure, the test shall resume as if the maintenance or failure had not occurred (i.e. if the test is stopped on day 5 for maintenance, it would then resume on day 6 after the maintenance is complete).

MAJOR FAILURE

Should a major failure occur, the Harris team will take prompt action to evaluate the issue and implement corrective action. After resolving the issue, the Harris project manager or engineering manager will document the resolution and provide notice of restarting the test at day 1.

RESOURCES AND DESIGNATIONS

Harris and WASHOE COUNTY will determine the necessary resources to execute and monitor the testing and ensure they are available to meet, perform, and complete the technical requirements as agreed upon. Such resources include personnel, facilities, site access, and the assistance of required WASHOE COUNTY personnel to conduct testing. Identified and agreed upon resources will be made available such that there is no impact to the cycle-time of the reliability test and performance of the task.

ACCEPTANCE

As identified on the project schedule, upon successful completion of the 30-Day Burn-in Period Test, Harris will submit the results of the test including a summary of issues and descriptions of resolutions performed. A joint meeting will follow, at a mutually agreeable location, to review the test documentation and obtain acceptance and agreement that the Burn-in Period Test was successfully executed, completed and approved.

Conclusion

Our philosophy is to maintain existing operations throughout the transition process. This continuous radio communications operations approach minimizes impact on the users until and during the time of transition. Harris will commit to the following:

- Uninterrupted operability between the new and existing radio system during transition
- Continued communications on normal and interoperability talkgroups in place today
- Single radio use during the transition and the operation of the new Harris radio device will stay consistent with existing operations
- Single dispatch console use during the transition

Warranty Plan

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Scope of Warranty Plan

SERVICE PROVIDER will provide this Warranty Plan ("Warranty Plan") for a projected forty-two (42) months for Region 1, twenty-seven (27) months for Region 2 and twelve (12) months for Region 3 such that all warranties end on the same date for Infrastructure Equipment and Software per the preliminary implementation schedule contained in Exhibit 4 – Project Schedule

If there are WASHOE COUNTY caused schedule delays beyond the projected implementation schedule from the acceptance of Region 1 to the acceptance of Region 3, SERVICE PROVIDER reserves the right to charge the WASHOE COUNTY an additional amount to compensate for schedule delays (i.e. Warranty extension).

Harris will also provide a 2-year warranty on Terminal Hardware from the date the hardware is put in service by the WASHOE COUNTY.

SERVICE PROVIDER is providing standard Warranty services packaged with additional Premium Warranty services for the Warranty Plan. The scope of the Warranty Plan is listed in Figure 1 and described individually in Statement of Works (SOWs).

Figure 1. Warranty Plan Scope of Services

Scope of Services	Standard and Premium Services During Warranty		
	NDOT	NVE	Washoe
Depot Repair and Return	YES	YES	YES
Priority Technical Assistant Center (P-TAC)	YES	YES	YES
Tech-Link (included in P-TAC)	YES	YES	YES
Software FX with SUMS - Harris Infrastructure and Subscribers	YES	YES	YES
Software Maintenance - Tait Infrastructue and Subscribers	YES	YES	YES
Software FX with SUMS and Tait Software Maintenance Installation	YES	YES	YES
Issue Resolution Support	YES	YES	YES
Preventive Maintenance (Infrastructure)	YES	YES	YES

Equipment Covered

The Warranty Plan covers all Equipment and Services provided by SERVICE PROVIDER under the Agreement as listed in Exhibit 5 – Equipment List.

Reused equipment is not covered by this Warranty Plan. Console upgrade software to Windows 10 is covered by this Warranty Plan but not the physical console hardware. The physical hardware is considered reused equipment.

WASHOE COUNTY Performed Warranty Repair

SERVICE PROVIDER provides WASHOE COUNTY the ability to perform maintenance and/or repairs during the Warranty Period without voiding or affecting the SERVICE PROVIDER's warranty or other responsibilities with proper, documented training. WASHOE COUNTY will provide all First Echelon support as outlined in the Issue Resolution Support SOW contained in this Warranty Plan.

WASHOE COUNTY technicians conducting warranty service work must complete the following technical training to be authorized to conduct the service work.

Figure 2. Technical Training Required

System Administration Training

Course Name	Course No.
P25 System Overview	YTSN4F
Unified Administration System	YTSN6B
Regional Network Manager	YTSN3V
Over-The-Air Rekeying	YTSN6C
Radio Programming & OTAP	YTSN6X

In addition to the classroom training, the technicians need to take the online System Administrator/Manager web-based training package through HTU.

- P25 Fleet Mapping Overview
- XL-200P Radio Operation
- Symphony Console Operation
- Radio Programming Overview
- Advanced Access Control (AAC)
- Radio Personality Manager (RPM & RPM 2)
- Unified Administration System (UAS) Overview
- Regional Network Manager (RNM) Overview
- Enterprise Network Manager (ENM)
- Over-The-Air Programming (OTAP)

- Active Directory
- Activity Warehouse
- Over-The-Air Rekeying (OTAR) Fundamentals
- Inter-RF Subsystem Interface (ISSI) Fundamentals

Radio Infrastructure Training

Course Name	Course No.
P25 System Maintenance	YTSN6D
Network Operation and Maintenance	YTSN3W
MASTR V Station Maintenance	YTSN8G
P25 Simulcast System Maintenance	YTSN8H
Tait P25 Conventional Configuration & Maintenance	YTSN4M
Regional Network Manager	YTSN3V

Radio Subscriber Training

Course Name	Course No.
RF Maintenance	YTSP7P

Work that is performed by a WASHOE COUNTY technician that has not been certified by receiving the prerequisite training will void the warranty for portions of the subsystems or components that they attempted to service. SERVICE PROVIDER will keep a list of all certified, trained technicians that have met the training requirements. If new technicians join the WASHOE COUNTY's staff, they must receive training and certification before working on the system.

Warranty Plan Statement of Works

Depot Repair and Return

SERVICE PROVIDER RESPONSIBILITIES

1. Provide a Return Material Authorization ("RMA") within two business days from the date of receipt of' WASHOE COUNTY request.
2. Depot Repair and Return receipt and inspection.
   - Receive Equipment from WASHOE COUNTY.
   - Verify against WASHOE COUNTY submitted RMA.
   - Perform a visual inspection.
   - Perform an operational check to determine if there is a problem and the nature of the problem.
3. Standard Repair
   - Schedule the standard repairs to be made to the Equipment.
   - Make the required repairs and test the functionality of the repaired Equipment.
   - Package, ship, and return the repaired Equipment to WASHOE COUNTY at SERVICE PROVIDER expense.
   - Provide a Summary Report, per repair as exemplified below, or another format as determined by SERVICE PROVIDER.

Repair Order	Date	Problem	Resolution	Resolution Date
123456	7/4/2017	No card communication.	Corrupt software. Reloaded. Passed communication tests.	7/4/2017

4. Standard Third-Party Original Equipment Manufacturer ("OEM") Equipment
   - Provide proper method for processing RMA against Third- Party Equipment.
   - Track Equipment sent to the OEM.
   - Provide status updates to WASHOE COUNTY.
   - Package, ship, and return the repaired Equipment to WASHOE COUNTY at SERVICE PROVIDER expense.
5. Non-standard Repair
   - SERVICE PROVIDER may determine with mutual agreement with the WASHOE COUNTY, that the repair of Equipment is not within the scope of Services of this SOW due to:
     - Extraordinary physical and other damages.
     - Equipment misuse, mishandling, improper storage, unauthorized Equipment modifications, detrimental exposure, or involvement in an accident (including without limitation liquid intrusions), Acts of God, including, without limitation, lightning damages.
   - If the Parties determine, for the reasons set forth above, that the Equipment is not within the scope of Services of this SOW, SERVICE PROVIDER shall either:
     - Determine and provide to WASHOE COUNTY an estimate of all additional charges required to perform repairs on the Equipment; or
     - Determine and provide to WASHOE COUNTY an estimate of all additional charges for replacement Equipment.
   - If WASHOE COUNTY approves the additional charges, the repaired or replacement Equipment shall be shipped to WASHOE COUNTY.
   - If WASHOE COUNTY disapproves the additional charges, SERVICE PROVIDER will charge a Diagnostic Fee of $105 per incident and return the unrepaired Equipment to WASHOE COUNTY.

6. Schedule

   - Fixed equipment mail-in board repair shall be completed within seven calendar days of receipt. Equipment will be returned to the WASHOE COUNTY via second-day shipping, with tracking number provided to the WASHOE COUNTY.
   - Standard Repairs – The time for completion for standard repairs is approximately ten business days from the date of receipt of the Equipment to the date of shipment of the repaired Equipment to WASHOE COUNTY.
   - Standard Third-Party Original Equipment Manufacturer ("OEM") Equipment Repairs – The time for completion for standard Third-Party OEM Equipment repairs is approximately 30 business days from the date of receipt of the Equipment to the date of shipment of the repaired Equipment to WASHOE COUNTY.
   - Non-standard Repairs – Non-standard repairs may take longer than standard repairs. SERVICE PROVIDER will notify WASHOE COUNTY of any repairs that take longer than ten business days.

7. Return Shipments to WASHOE COUNTY

   - Equipment shipments shall occur as the individual RMA Equipment is repaired.
   - Multiple Equipment listed on a single RMA shall be shipped together to WASHOE COUNTY if complete shipment is specifically requested by WASHOE COUNTY.
   - SERVICE PROVIDER will properly pack outbound shipments and bears the responsibility for damage that occurs prior to delivery to WASHOE COUNTY.

WASHOE COUNTY RESPONSIBILITIES

1. Request RMA using SERVICE PROVIDER provided process.
2. Follow the current RMA instructions.
3. Pack Equipment adequately to prevent damages during transit. Equipment damaged in transit will be returned to WASHOE COUNTY un-repaired and may incur a Diagnostic Fee.
4. Ship, at SERVICE PROVIDER'S expense, the Equipment listed in the RMA either to SERVICE PROVIDER' Depot Repair and Return or another mutually agreed facility.
5. If WASHOE COUNTY wants multiple items listed on a single RMA to be returned together, WASHOE COUNTY shall request complete shipment.
6. Approve or disapprove additional charges within five business days.
7. Pay a Diagnostic Fee if WASHOE COUNTY disapproves the additional charges.
8. Contact SERVICE PROVIDER and arrange for advanced replacement.

Priority Technical Assistance Center (P-TAC)

DESCRIPTION OF SERVICES

1. Priority TAC provides technical telephone support twenty-four (24) hours per day, seven (7) days a week, including holidays via a dedicated telephone number and access to Tech-Link. Knowledgeable and experienced TAC personnel provide support on product operation, programming, maintenance and troubleshooting for SERVICE PROVIDER fixed site equipment, mobiles, and portables. Priority TAC also guarantees a two (2) hour response time if TAC personnel are not readily available to answer the call and a one (1) hour response time for Emergency Calls.

SERVICE PROVIDER RESPONSIBILITIES

1. Provide WASHOE COUNTY with twenty-four (24) hours per day - seven (7) days a week - three hundred sixty-five (365) days a year technical telephone assistance for resolving problems with their SERVICE PROVIDER fixed site equipment, mobile and portable Subscriber equipment. TAC support personnel will endeavor to respond to calls as quickly as they are received; however, if all support personnel are busy, a call back will be made within one (1) hour from the time the first support request was received.
2. Provide emergency assistance twenty-four (24) hours per day- seven (7) days a week - three hundred sixty-five (365) days a year. TAC support personnel will return all Emergency Calls within one (1) hour.
3. Provide WASHOE COUNTY with access to Tech-Link. Tech-Link provides access to various on-line support tools via a secure website; WASHOE COUNTY will receive a user ID and password allowing them access to the secured website. This secure website gives WASHOE COUNTY 24x7x365 access to technical service memos, the technical library, current software release notes, user documentation and answers to frequently asked questions.
4. If on-site support is required, the TAC personnel will coordinate with the appropriate SERVICE PROVIDER personnel to provide the needed on-site support.

Software FX with SUMS – SERVICE PROVIDER Infrastructure and Subscribers

DESCRIPTION OF SERVICES

SERVICE PROVIDER's Software FX is a comprehensive software maintenance program that provides periodic Software Updates to SERVICE PROVIDER developed software applications and system Security Updates. Software FX is made of three elements. This SOW covers system software release 10A and succeeding versions.

1. The first element provides updates to SERVICE PROVIDER developed software programs. These Software Updates are baseline tested as system level releases and provided as a package to ensure compatibility across system infrastructure, radio components, and programming utilities. The Software Updates include enhancements to the existing software baseline, corrections to issues, and the ability to purchase and enable newly developed licensed features. All software media and revised software manuals are provided at the time of any software revisions and are available in manual form or on-line through SERVICE PROVIDER's Tech-Link web portal. SERVICE PROVIDER will separate corrective revisions from enhancements; however, if new releases are necessary to provide corrections, then the entire release (including enhancements) shall be provided.
2. The second element, SUMS, for SERVICE PROVIDER Infrastructure only, provides periodic security-related updates to mitigate identified software vulnerabilities. SERVICE PROVIDER monitors governmental and open source information databases to identify vulnerabilities applicable to the Designated System. Updates are tested on dedicated security verification test systems to ensure proper system operation prior to general release. Security Updates may include Microsoft security updates, Sybase, SQL, Red Hat Linux and other security-related updates that are relevant to the Designated System. Security Updates are electronically distributed to target devices via a client - server application running within the designated system. This application provides the full scheduling capabilities should an application restart or server reboot be necessary to complete the update process.
3. The third element, Tech-Link, provides WASHOE COUNTY access to various on-line support tools via a secure website. WASHOE COUNTY will receive a user ID and password allowing them access to the secured website. In addition to providing access to Software Updates, the secure website gives WASHOE COUNTY

24x7x365 access to technical service memos, the technical library, current software release notes, user documentation and answers to frequently asked questions.

4. All updates shall be shipped to the WASHOE COUNTY's Software FX contact as designated below and installed by SERVICE PROVIDER.

SERVICE PROVIDER RESPONSIBILITIES

1. SERVICE PROVIDER will provide WASHOE COUNTY Software Updates, documentation updates and software release notes.
2. Prior to the general release of a major system release, SERVICE PROVIDER shall make available a system level release document announcing the impending release and detailing its contents and impact.
3. Provide Security Updates, security release notes, and installation instructions at periodic intervals targeting bi-monthly releases. More frequent Security Update distributions may be required to address urgent product security vulnerabilities. Security Update distributions on other than a bi-monthly basis does not constitute a contractual default or breach by SERVICE PROVIDER.
4. Provide method to deliver Security Updates to the target devices within the WASHOE COUNTY's Designated System via an automated client - server distribution application.
5. Monitor pertinent governmental, vendor, independent and open source databases for security vulnerabilities and any subsequent resolutions that affect products provided by SERVICE PROVIDER that are part of the WASHOE COUNTY's Designated System.
6. Identify and document latest system vulnerabilities and compliance issues discovered. Provide a status and recommendations report via Tech-Link.
7. Pretest the Security Updates to ensure that they do not adversely affect SERVICE PROVIDER' stated performance of the WASHOE COUNTY's Designated System. Testing is performed on dedicated security verification test systems to ensure proper operation prior to general release.
8. Reassess the system configuration annually and provide revised pricing should any significant changes be made to WASHOE COUNTY's Designated System(s)

configuration. Unless otherwise identified in this SOW, revised pricing will be reflected in the following year's Software FX fee. If SERVICE PROVIDER's rates for Software FX should increase, the WASHOE COUNTY will be notified in writing of any such increases at least 120 days prior to the end of Subscriber's yearly Software FX period then in effect.

9. Replace any hardware that is impacted by software updates during the Warranty Period

WASHOE COUNTY RESPONSIBILITIES

1. Properly install or allow SERVICE PROVIDER to install the Software Updates provided by SERVICE PROVIDER in order of receipt from SERVICE PROVIDER. WASHOE COUNTY recognizes that software support provided by SERVICE PROVIDER is limited to SERVICE PROVIDER's current and current minus 2 software release levels of software programs.
2. Complete or allow SERVICE PROVIDER to complete the Security Update process on the target devices (e.g. rebooting the target devices) following the instructions accompanying each Security Update distribution.
3. Cooperate with SERVICE PROVIDER and perform all acts that are reasonable or necessary to enable SERVICE PROVIDER to provide the services in this SOW to WASHOE COUNTY.
4. Designate a contact individual(s) or group(s) with sufficient technical expertise to be able to interact knowledgeably with SERVICE PROVIDER's technical support personnel.
5. Purchase of all necessary software licenses to enable the automated distribution of Security Updates for new and existing devices not previously licensed as part of the original Designated System purchase.
6. WASHOE COUNTY hereby delegates, grants, and assigns to SERVICE PROVIDER, acting as the WASHOE COUNTY's agent, all approval rights relating to the selection of vendor patches. All approvals given to Third-Party vendors shall be deemed as being granted by the WASHOE COUNTY.

7. Provide the below designated contact information. The below designated contact will receive all notices and software and Security Updates provided under this SOW.

Name	Shawn Tayler – Washoe County Regional Communications System
Title	Regional Communications Coordinator
Phone	1-775-85-5952
Email	stayler@washoecounty.us

OTHER CHARGES

1. WASHOE COUNTY may be required to have currently executed service(s)/support agreement(s) with Third-Party vendor(s) separate from this SOW to receive certain Security Updates. Failure to do so may limit the WASHOE COUNTY's right to receive the Third-Party software.

EXCLUSIONS

1. Any Software products released by SERVICE PROVIDER for which an earlier generation or release level of software is not already contained within WASHOE COUNTY's Designated System is not included in this SOW.

Software Maintenance – Tait Infrastructure and Subscribers

WASHOE COUNTY IS ENTITLED TO RECEIVE

1. Software and firmware releases relevant to and within the licensed feature set of Equipment.
2. Access to the Software releases referred to in this SOW shall be through PSPC Info Center or via email PSPC_TAC@Harris.com.
3. SERVICE PROVIDER will provide technical support described in this SOW for the current and up to three previous releases of Software and firmware. Technical support for previous software releases is at SERVICE PROVIDER's discretion and may require additional payment by WASHOE COUNTY.
4. SERVICE PROVIDER shall maintain only the current Software release for Tait Equipment. If WASHOE COUNTY has a problem with a non-current release of Software, WASHOE COUNTY may be required to install, at WASHOE COUNTY's expense, the most current version of Software to remedy such problem.
5. This SOW does not include the provision of WASHOE COUNTY requested enhancements, modifications, or developments. Any such enhancement, modification or development may be requested by WASHOE COUNTY, for an additional fee, via the Help Desk, for consideration by SERVICE PROVIDER.

Software FX with SUMS and Tait Software Maintenance Installation

SERVICE PROVIDER RESPONSIBILITIES

1. Provide WASHOE COUNTY with a Business Hours installation schedule and approximate Equipment outage times (if applicable).
2. Install Software FX and SUMS updates and Tait Software Maintenance updates.
3. Provide WASHOE COUNTY with a Summary Report as part of a monthly reporting cycle as exemplified below, or another format as determined by SERVICE PROVIDER:

WO No.	Date	Problem	Resolution	Resolution Date
123456	7/4/2017	Software FX received.	Loaded new Software per release notes.	7/4/2017

4. Provide software update for all SERVICE PROVIDER and Tait Infrastructure, Dispatch and User Radio equipment to the same and latest software release prior to the end of Warranty.

WASHOE COUNTY RESPONSIBILITIES

1. Decide whether to install or not install Software Updates based on the risks and benefits involved and waive all SERVICE PROVIDER liability for such decision.
2. Provide a suitable service environment (HVAC, power, illumination, grounding, internet access if applicable).
3. Provide SERVICE PROVIDER unlimited, safe, physical, and remote access to WASHOE COUNTY sites and Equipment to support delivery of Services.
4. Notify SERVICE PROVIDER when there is any activity that impacts the system, Equipment, or Services.
5. Provide SERVICE PROVIDER instant and easy access to all Equipment, data, and power points.

6. Provide Subscriber equipment collected in at several, mutually agreed, central points.
7. Ensure SERVICE PROVIDER can perform Services in one continuous effort.
8. Waive Services and reimbursement for Services when access is not provided to SERVICE PROVIDER for scheduled Services or the Software installation is deemed not necessary by SERVICE PROVIDER or SERVICE PROVIDER is unable to provide Services due to WASHOE COUNTY responsibilities.
9. Pay Demand Services for additional efforts including, delays in work, non-SERVICE PROVIDER Software or cable interface acquisition, configuration or engineering services, or repairs.
10. Cooperate with SERVICE PROVIDER and perform all efforts that are necessary to enable SERVICE PROVIDER to provide the Services to WASHOE COUNTY.

EXCLUSIONS

1. No Software Installation will be provided on Equipment unless targeted by the SERVICE PROVIDER Software FX Software Update or Tait Software Maintenance update.

Issue Resolution Support

INTRODUCTION

This SOW describes the procedure and SERVICE PROVIDER's involvement to address periodic system issues as they arise during the Warranty period. To facilitate understanding, flow charts will be utilized for each step of escalation.

STEP 1: First Echelon WASHOE COUNTY Support

The first step in exploring an issue is for the WASHOE COUNTY to attempt to correct an issue on their own (i.e. First Echelon support). The WASHOE COUNTY will attempt to resolve the issue remotely with their own staff. If not correctable remotely, the WASHOE COUNTY will dispatch a WASHOE COUNTY technician to go to the location and work with the remote WASHOE COUNTY in an attempt to resolve the issue.

Figure 3 – First Echelon Support Flow provides a visual of the process flow for First Echelon support.

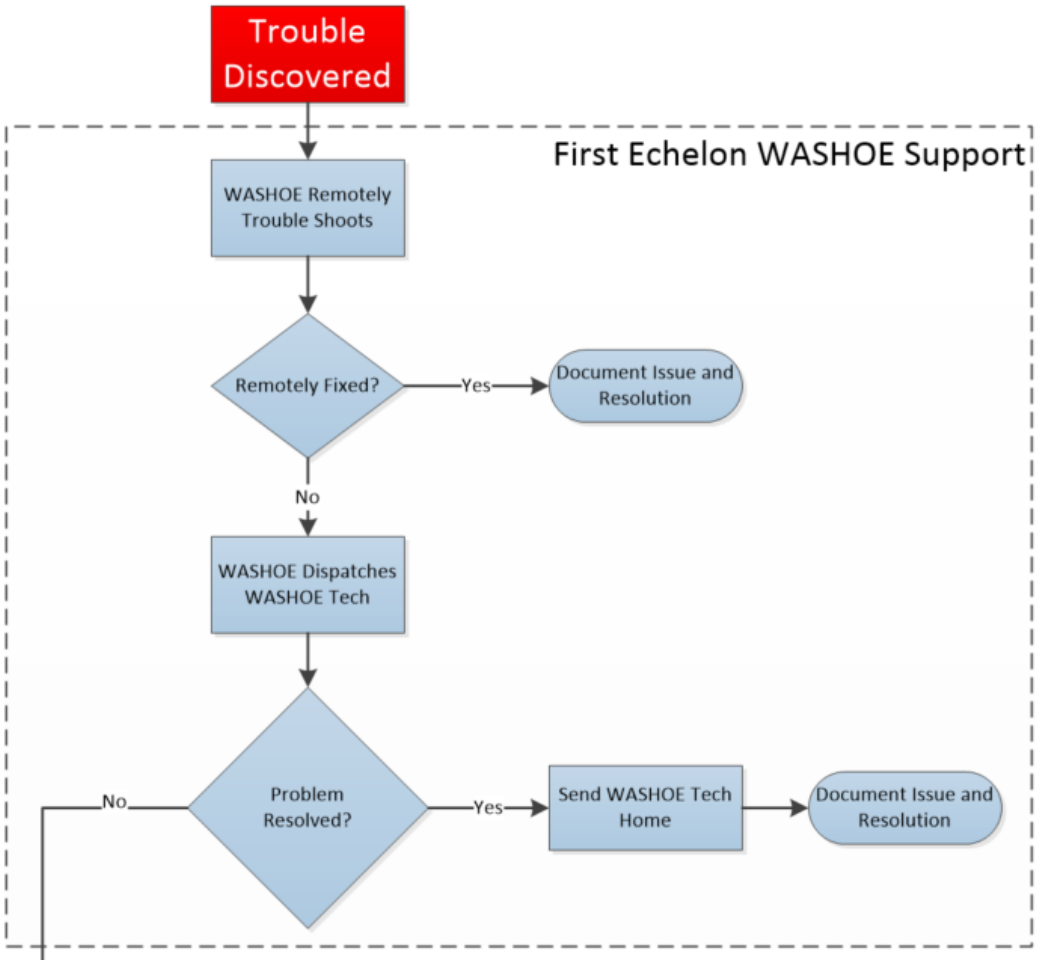
SERVICE PROVIDER Responsibilities:

- None

WASHOE COUNTY Responsibilities:

- Provide technical personnel and networked based computing resources that can remotely examine system performance.
- Provide technical personnel that can troubleshoot issues at a site.
- Provide computers, networking equipment and calibrated test equipment to WASHOE COUNTY staff that will adequately allow the staff to troubleshoot issues.
- Maintain adequate spares to support quick issue resolution.
- Log each ticket in the AMPS system or similar platform.

Figure 3. First Echelon Support Flow



STEP 2: SERVICE PROVIDER Level 1 (L1) Support

The second step in the process is initiated if WASHOE COUNTY team cannot solve the issue remotely or with a WASHOE COUNTY technician on site.

WASHOE COUNTY would then call an answering service who would attempt to call the on-call technician. If the on-call technician does not reply within 15 minutes of WASHOE COUNTY's call to the answering service, the answering service will continue to call the on-call tech plus call the Western Regional Service Manager. If neither reply within 25 minutes of WASHOE COUNTY's call to the answering service, the answering service will call the Director of Field Services. This is the Escalation Plan that will be followed to ensure the WASHOE COUNTY receives a call back acknowledging receipt of an issue reported within 30 minutes of WASHOE COUNTY contacting the answering service. The requirement is for a SERVICE PROVIDER person to call the WASHOE COUNTY back within 30 minutes acknowledging awareness of the issue.

The support structure is identified below in the flow chart as "Nevada 24x7". Nevada 24x7 is a group of in-state personnel that will support the WASHOE COUNTYs in their efforts to trouble shoot issues. The Wester Regional Service Manager and his direct staff and indirect channel partners will provide the second line of defense for system issues that arise.

The process flow for L2 support is shown in **Figure 4 – L1 Support Flow.**

The Escalation Plan:

- Step 1
  - WASHOE COUNTY's single point of contact or on-call personnel will call a defined local number for an answering service. The answering service will take WASHOE COUNTY's name, number and reason for the call. The answering service will then attempt to contact the SERVICE PROVIDER on-call technician.
- Step 2
  - If after fifteen (15) minutes of WASHOE COUNTY's call to the answering service the SERVICE PROVIDER on-call technician has not responded to the answering service and WASHOE COUNTY, the answering service will continue to call the SERVICE PROVIDER on-call technician plus the Regional Service Manager.

- Step 3
  - If after twenty-five (25) minutes of WASHOE COUNTY's call to the answering service neither the SERVICE PROVIDER on-call technician or the Regional Service Manager have responded to the answering service and WASHOE COUNTY, the answering service will call the SERVICE PROVIDER's Director of Field Services.
- Step 4
  - If SERVICE PROVIDER does not reply to the answering service within 30 minutes, answering service will call WASHOE COUNTY with a status update and continue to call all three levels of SERVICE PROVIDER escalation.

For L1 support, SERVICE PROVIDER will also attempt to remotely diagnose the issue along with the WASHOE COUNTY remote support person and on-site WASHOE COUNTY technician.

If SERVICE PROVIDER L1 remote person cannot assist in the resolution, the next step in the L1 process is for the SERVICE PROVIDER remote person to contact SERVICE PROVIDER' PTAC group for assistance.

If SERVICE PROVIDER L1 remote person, PTAC, WASHOE COUNTY remote person and WASHOE COUNTY on site technician cannot resolve the issue, the issue is escalated to Level 2 (L2). The Regional Service Manager will be responsible for driving the actions to resolve the issue.

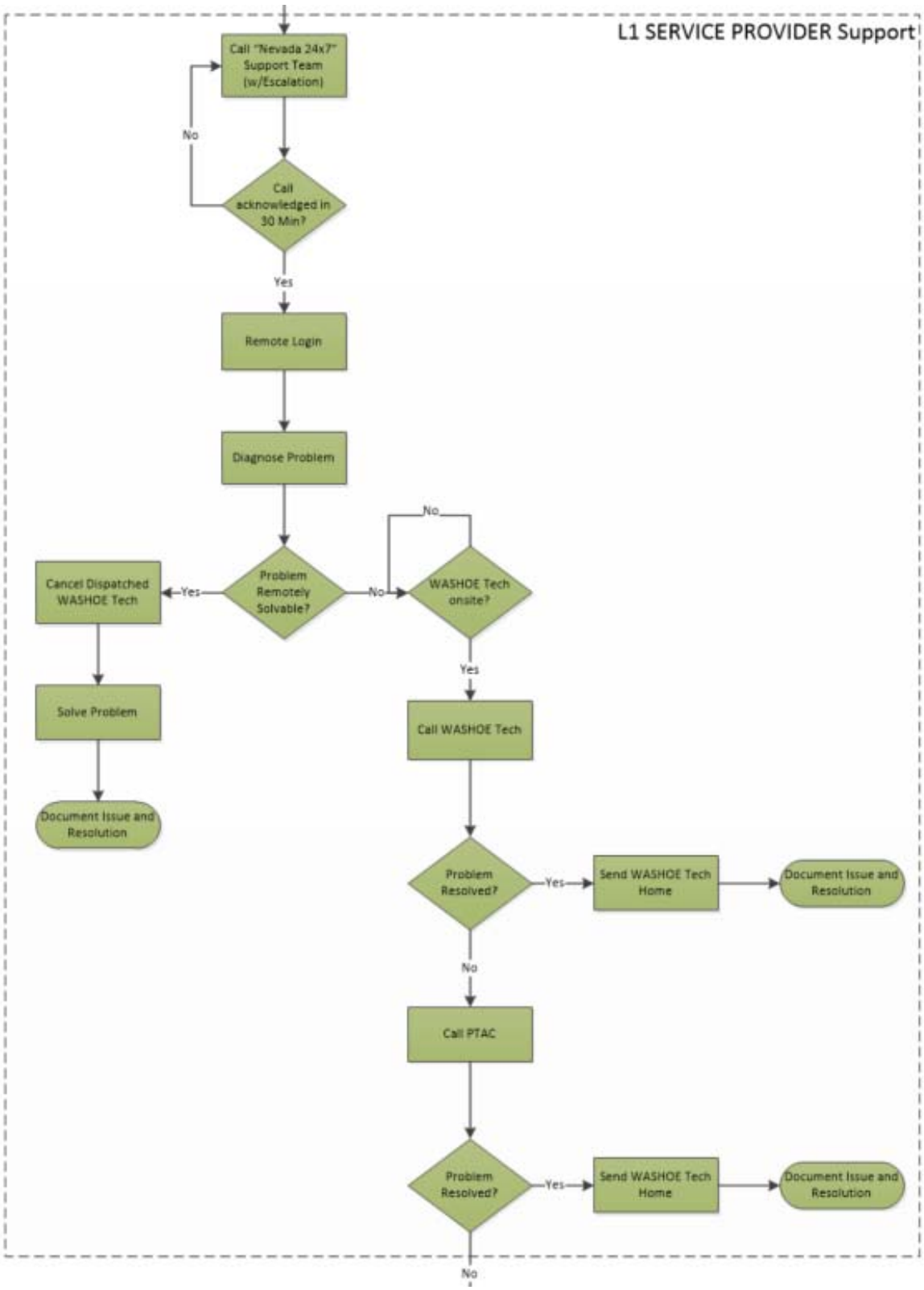
SERVICE PROVIDER Responsibilities:

- Provide qualified technical people to be on-call 24x7 that meet WASHOE COUNTY access policies.
- Provide the tools and equipment to the SERVICE PROVIDER staff for being able to remotely diagnose
- Provide PTAC assistance (separate service/SOW that is being procured by the WASHOE COUNTYs).

WASHOE COUNTY Responsibilities:

- Provide remote access to the NSRS systems for approved SERVICE PROVIDER staff.
- Provide technical personnel and networked computing resources that can remotely examine system performance
- Provide technical personnel that can troubleshoot issues at a site
- Provide computers, networking equipment and calibrated test equipment to WASHOE COUNTY staff that will adequately allow the staff to troubleshoot issues.
- Maintain adequate spares to support quick issue resolution.
- Ensure WASHOE COUNTY technician will remain on site throughout the duration of resolution

Figure 4. L1 Support Flow



STEP 3: SERVICE PROVIDER Level 2 (L2) Support

The third step in the process is initiated if the First Echelon and L1 support are unsuccessful in solving the issue.

If the issue is escalated to L2, the first step in the process is to conduct a Joint Action Plan meeting between WASHOE COUNTY and SERVICE PROVIDER. The goal of the meeting is to coordinate efforts, determine if a SERVICE PROVIDER direct staff technician or SERVICE PROVIDER indirect channel partner technician should be dispatched and to determine severity of the issue. The Regional Service Manager will be responsible for driving the actions from the Joint Action meeting.

If the decision is made to dispatch a SERVICE PROVIDER technician, the timing and logistics of getting SERVICE PROVIDER technician on site to join the WASHOE COUNTY technician will be mutually agreed upon. The goal for easily accessible sites with a Critical Service issue will be 8 hours. For remote and special vehicle access sites, best effort will be utilized with the goal of having the SERVICE PROVIDER technician on site within 24 hours. SERVICE PROVIDER and the WASHOE COUNTY will mutually agree on the best method and timing to reach remote sites. will mutually agree on the best method and timing to reach remote sites.

Figure 5 – Critical Service Issues identifies the issues that are deemed “Critical” and require the utmost urgency to resolve and Figure 6 – L2 Support Flow outlines the process flow for L2 support.

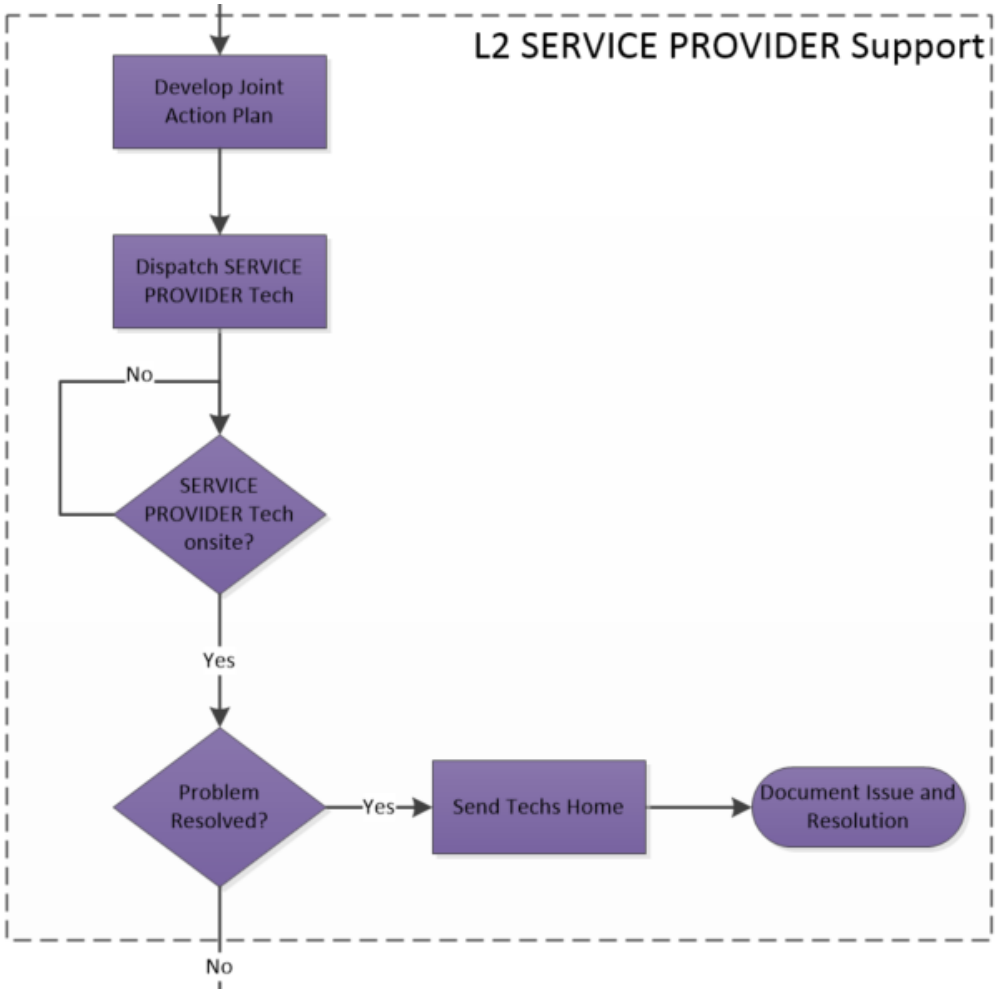
Figure 5. Critical Service Issues

Critical Service Issues
Any failure which causes a loss of 15% or more in capacity or coverage in any cell
Any failure which causes a loss of simulcast capability
Any failure which causes a loss of the primary core
Any system failure that causes the loss of two or more console positions
Any failure that renders the logging recorder inoperable or causes a loss of recorded audio
The failure of two or more repeaters
Concurrent failure of two or more switches and/or routers
Failure of the receiver voting system

Once the technician is on site, five different technical personnel will be attempting to diagnose the issue.

1. WASHOE COUNTY Remote support
2. SERVICE PROVIDER Remote support
3. P-TAC
4. WASHOE COUNTY on site technician
5. SERVICE PROVIDER on site technician

Figure 6. L2 Support Flow



SERVICE PROVIDER Responsibilities:

- Provide qualified technical people to be on-call 24x7 that meet WASHOE COUNTY access policies.
- Provide the tools and equipment to the SERVICE PROVIDER staff for being able to remotely diagnose
- Provide PTAC assistance (separate service/SOW that is being procured by the WASHOE COUNTY).
- Provide technical personnel that can troubleshoot issues at a site that meet WASHOE COUNTY access policies.
- Provide computers, networking equipment and calibrated test equipment to SERVICE PROVIDER staff that will adequately allow the staff to troubleshoot issues.
- Ensure SERVICE PROVIDER technician will remain on site throughout the duration of resolution.

WASHOE COUNTY Responsibilities:

- Provide remote access to the NSRS systems for approved SERVICE PROVIDER staff.
- Provide technical personnel and networked computing resources that can remotely examine system performance
- Provide technical personnel that can troubleshoot issues at a site
- Provide computers, networking equipment and calibrated test equipment to WASHOE COUNTY staff that will adequately allow the staff to troubleshoot issues.
- Maintain adequate spares to support quick issue resolution.
- Ensure WASHOE COUNTY technician will remain on site throughout the duration of resolution

STEP 4: SERVICE PROVIDER Level 3 (L3) Support

The fourth step in the process is initiated if the First Echelon support, L1 support and L2 support are unsuccessful in solving the issue.

If the issue is escalated to L3, the first step in the process is to conduct a Joint Action Plan meeting between WASHOE COUNTY and SERVICE PROVIDER. The goal of the meeting is to coordinate efforts, determine if a SERVICE PROVIDER engineer should be dispatched. The Regional Service Manager will be responsible for driving the actions from the Joint Action meeting.

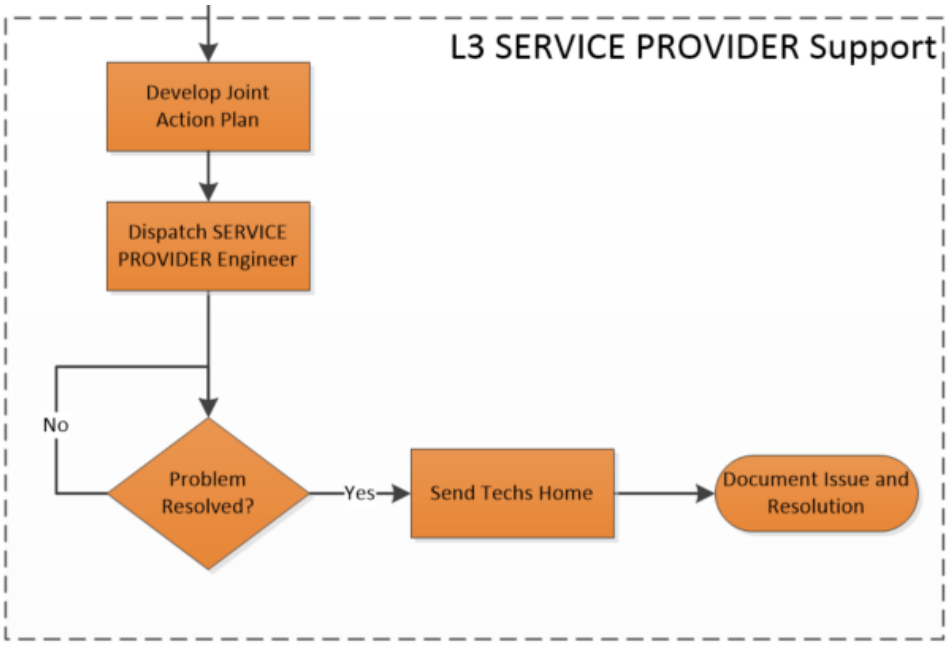
If the decision is made to dispatch a SERVICE PROVIDER engineer, the timing and logistics of getting the SERVICE PROVIDER engineer on site to join the WASHOE COUNTY technician and SERVICE PROVIDER technician will be mutually agreed upon. The goal for easily accessible sites with a Critical Service issue will be 8 hours. For remote and special vehicle access sites, best effort will be utilized with the goal of having the SERVICE PROVIDER engineer on site within 24 hours. SERVICE PROVIDER and the WASHOE COUNTY will mutually agree on the best method and timing to reach remote sites.

Figure 7 – L3 Support Flow outlines the process flow for L3 support. Notice that the issue will remain at L3 status until resolved.

Once the SERVICE PROVIDER engineer is on site, six different technical personnel will be attempting to diagnose the issue.

1. WASHOE COUNTY Remote support
2. SERVICE PROVIDER Remote support
3. P-TAC
4. WASHOE COUNTY on site technician
5. SERVICE PROVIDER on site technician
6. SERVICE PROVIDER on site engineer

Figure 7. L3 Support Flow



SERVICE PROVIDER Responsibilities:

- Provide qualified technical people to be on-call 24x7 that meet WASHOE COUNTY access policies.
- Provide the tools and equipment to the SERVICE PROVIDER staff for being able to remotely diagnose
- Provide PTAC assistance (separate service/SOW that is being procured by the WASHOE COUNTY).
- Provide technical personnel that can troubleshoot issues at a site that meet WASHOE COUNTY access policies.
- Provide computers, networking equipment and calibrated test equipment to SERVICE PROVIDER staff that will adequately allow the staff to troubleshoot issues.
- Ensure SERVICE PROVIDER technician and engineer will remain on site throughout the duration of resolution.

WASHOE COUNTY Responsibilities:

- Provide remote access to the NSRS systems for approved SERVICE PROVIDER staff.
- Provide technical personnel and network-based computing resources that can remotely examine system performance
- Provide technical personnel that can troubleshoot issues at a site
- Provide computers, networking equipment and calibrated test equipment to WASHOE COUNTY staff that will adequately allow the staff to troubleshoot issues.
- Maintain adequate spares to support quick issue resolution.
- Ensure WASHOE COUNTY technician will remain on site throughout the duration of resolution

REPORT GENERATION

If the issue is resolved by the WASHOE COUNTY First Echelon team, the WASHOE COUNTY will be responsible for generating the issue resolution report.

If the issue is resolved by SERVICE PROVIDER at the L1, L2 or L3 levels of support, SERVICE PROVIDER will be responsible for generating the issue resolution report.
SERVICE PROVIDER and the WASHOE COUNTY will mutually agree on the format of the issue resolution report but, at a minimum, it must include:

- Time issue was reported
- Location were issue is being observed
- Symptoms of the issue
- Information regarding Group ID, Unit ID and functionality impacted.
- Time to resolve issue
- Disposition of issue
- Date of issue closure
- Corrective Action if applicable

SPARE PART CONTROL

WASHOE COUNTY will be responsible for Spare Part Control including replenishment and usage reporting.

ADDITIONAL CONDITIONS REGARDING SITE ACCESS AND RESPONSE TIMES

1. The goal for easily accessible sites with a Critical Service issue will be 8 hours. For remote and special vehicle access sites, best effort will be utilized with the goal of having the SERVICE PROVIDER engineer on site within 24 hours. SERVICE PROVIDER and the WASHOE COUNTY will mutually agree on the best method and timing to reach remote sites.
2. WASHOE COUNTY is responsible to ensure that all necessary clearances, escorts, ID cards, network access requirements including custom software or security credentials, or other special requirements have been provided to SERVICE PROVIDER in advance to allow technicians and engineers prompt access to any Equipment requiring service that may be in a secured or limited access area under WASHOE COUNTY's control.
3. WASHOE COUNTY agrees to provide SERVICE PROVIDER an appropriate work environment and unlimited access, working space including heat, light ventilation, electric current and outlets, and local wireless, telephone access or networking port for the use of SERVICE PROVIDER' service personnel in the Equipment's physical location if reasonably possible.
4. WASHOE COUNTY agrees to setup a communications coordination talk group on the system for troubleshooting purposes in support of this Issue Resolution plan primarily for use at remote sites.

Preventive Maintenance on SERVICE PROVIDER Infrastructure and Tait Infrastructure

SERVICE PROVIDER RESPONSIBILITIES

1. Perform Preventive Maintenance which provides tests, checks, and alignment WASHOE COUNTY's Equipment to ensure the Equipment meets specifications. 's Equipment to ensure the Equipment meets specifications.
2. At WASHOE COUNTY's request, at Demand Services rates, perform services for work other than tests, checks, and alignment.
3. Provide WASHOE COUNTY with a Preventive Maintenance Work Hours schedule and approximate Equipment outage times (if any).
4. Provide optimization of Equipment to SERVICE PROVIDER' best practices or third party best practices as applicable.
5. Provide WASHOE COUNTY with a Summary Report as part of a monthly reporting cycle as exemplified by Preventive Maintenance SERVICE PROVIDER Infrastructure Table, or another format as determined by SERVICE PROVIDER.
6. If spares are consumed during a Preventative Maintenance, include the model and serial number of both the defective unit and the spare in the Summary Report.

WASHOE COUNTY RESPONSIBILITIES

1. Provide a suitable service environment (HVAC, power, illumination, grounding, internet access if applicable).
2. Provide SERVICE PROVIDER unlimited, safe, physical and remote access to WASHOE COUNTY sites and equipment to support delivery of Service.
3. Notify SERVICE PROVIDER when there is any activity that impacts the system, Equipment, or Services.
4. Provide SERVICE PROVIDER instant and easy access to all Equipment, data, and power points.
5. Ensure SERVICE PROVIDER can perform Services in one continuous effort.

6. Waive Services and reimbursement for Services when access is not provided to SERVICE PROVIDER for scheduled Services or SERVICE PROVIDER is unable to provide Services due to WASHOE COUNTY responsibilities.
7. Pay Demand Services for additional efforts including Equipment removal, Equipment aggregation management, delays in work, repairs or replacement.
8. Cooperate with SERVICE PROVIDER and perform all efforts that are necessary to enable SERVICE PROVIDER to provide the Services to WASHOE COUNTY.
9. Review Summary Report, and within 30 days of receipt, provide direction for further action.

ADDITIONAL CONDITIONS

1. WASHOE COUNTY is responsible to ensure that all necessary clearances, escorts, ID cards, network access requirements including custom software or security credentials, or other special requirements have been provided to SERVICE PROVIDER in advance to allow technicians prompt access to any Equipment requiring service that may be located in a secured or limited access area under WASHOE COUNTY's control.
2. WASHOE COUNTY shall be billed at Demand Services rates for time lost or changes due WASHOE COUNTY in the provision or execution of the Services. in the provision or execution of the Services.

PREVENTATIVE MAINTENANCE CHECKLIST

Figure 8 provides Services to be performed as applicable during the Preventive Maintenance Exhibit 5 – Equipment List. The technician will attempt to bring the equipment into specification, if necessary. If repairs are required and authorized by the WASHOE COUNTY, a separate work order will be created and noted in the actions., a separate work order will be created and noted in the actions.

Figure 8. Preventive Maintenance Checklist

Technician _____ Date _____

SERVICE PROVIDER Infrastructure Equipment	Preventive Maintenance (If Applicable & as Necessary)	Period	Pass Fail	Notes or Recommended Actions to Take
GENERAL	Check RF, data and audio cable condition	Once per year during the Warranty term		
	Check general alarm status, troubleshoot and investigate any found alarm conditions	Once per year during the Warranty term		
	Check condition of punch blocks	Once per year during the Warranty term		
	Perform a general talkgroup test	Once per year during the Warranty term		
	Perform a multisite test	Once per year during the Warranty term		
	Perform an individual call test	Once per year during the Warranty term		
MASTR V BASE STATION (Manual MM-017079-001)	Check simulcast timing, adjust, if needed	Once per year during the Warranty term		

SERVICE PROVIDER Infrastructure Equipment	Preventive Maintenance (If Applicable & as Necessary)	Period	Pass Fail	Notes or Recommended Actions to Take
MASTR V	Check transmitter RF power output per design specifications	Once per year during the Warranty term		
MASTR V	Check transmitter frequency stability is within specification	Once per year during the Warranty term		
MASTR V	Check modulation deviation is within specification	Once per year during the Warranty term		
Receive Multicoupler and connections to RX	Check Receiver sensitivity and BER	Once per year during the Warranty term		
Network Alarm Equipment	Verify alarm functionality	Once per year during the Warranty term		
System	Check call processing, each working (voice) channel	Once per year during the Warranty term		
All equipment including network equipment	Clean physical filters clean or replace, as needed	Once per year during the Warranty term		
Antenna System	Inspect and sweep RF TX and RX antenna cables. Inspect RF cable,	Once per year during the Warranty term		

SERVICE PROVIDER Infrastructure Equipment	Preventive Maintenance (If Applicable & as Necessary)	Period	Pass Fail	Notes or Recommended Actions to Take
	connectors and suppressor in the shelter. lines			
Network and Console Equipment	Inspect audio and data cables for snug connection and corrosion	Once per year during the Warranty term		
Site/system	Verify control channel operation and rolling	Once per year during the Warranty term		
Site Equipment	Perform power supply voltage checks	Once per year during the Warranty term		
CONVENTIONAL RADIO BASE STATION	Check transmitter RF power output doesn't exceed design specifications	Once per year during the Warranty term		
Tait 800/VHF	Check transmitter frequency stability is within specification	Once per year during the Warranty term		
Tait 800/VHF	Check modulation deviation is within specification on VHF and 800	Once per year during the Warranty term		

SERVICE PROVIDER Infrastructure Equipment	Preventive Maintenance (If Applicable & as Necessary)	Period	Pass Fail	Notes or Recommended Actions to Take
Tait 800/VHF	Check Receiver sensitivity	Once per year during the Warranty term		
Tait 800/VHF	Verify alarm functionality	Once per year during the Warranty term		
Tait 800/VHF	Perform voice call processing, each 800 and VHF channel	Once per year during the Warranty term		
Tait 800/VHF and Network Equipment	Clean or replace physical filters	Once per year during the Warranty term		
Tait 800/VHF	Inspect and sweep RF, TX, and RX antenna cables. Inspect RF cable, connectors and suppressor in the shelter.	Once per year during the Warranty term		
Tait 800/VHF	Inspect audio and data cables for snug connection and corrosion	Once per year during the Warranty term		

SERVICE PROVIDER Infrastructure Equipment	Preventive Maintenance (If Applicable & as Necessary)	Period	Pass Fail	Notes or Recommended Actions to Take
Tait 800/VHF	Perform power supply voltage checks			
GPS RECEIVERS	Verify GPS sync	Once per year during the Warranty term		
	Verify alarm functionality	Once per year during the Warranty term		
	Verify battery functionality	Once per year during the Warranty term		
	Check power supply voltage	Once per year during the Warranty term		
NETWORK	Check and verify RNM alarms	Once per year during the Warranty term		
	Inspect Ethernet cables	Once per year during the Warranty term		
	Check MPLS router voltage	Once per year during the Warranty term		

SERVICE PROVIDER Infrastructure Equipment	Preventive Maintenance (If Applicable & as Necessary)	Period	Pass Fail	Notes or Recommended Actions to Take
	Check MPLS router cables	Once per year during the Warranty term		
	Check MPLS router alarms	Once per year during the Warranty term		
	Check dual CPU operation	Once per year during the Warranty term		
	Check servers for dust; clean and replace filter, as necessary	Once per year during the Warranty term		
CONSOLE ACCESSORIES	Check microphone, headset jacks, foot switches for condition and functionality	Once per year during the Warranty term		
CALL DIRECTOR	Check functionality	Once per year during the Warranty term		
ISSI	Coordinate with WASHOE COUNTY for outside agencies and check functionality	Once per year during the Warranty term		

SERVICE PROVIDER Infrastructure Equipment	Preventive Maintenance (If Applicable & as Necessary)	Period	Pass Fail	Notes or Recommended Actions to Take
	Check for alarms	Once per year during the Warranty term		
NSS	Verify high availability (HA) functionality	Once per year during the Warranty term		
	Check for alarms	Once per year during the Warranty term		
	Check servers for dust	Once per year during the Warranty term		
	Check servers are operating on most current software revision	Once per year during the Warranty term		
	Check BeOn functionality	Once per year during the Warranty term		
SYMPHONY CONSOLES	Check for system connectivity	Once per year during the Warranty term		
	Verify console basic call functionality. Perform voice calls on talk groups	Once per year during the Warranty term		

SERVICE PROVIDER Infrastructure Equipment	Preventive Maintenance (If Applicable & as Necessary)	Period	Pass Fail	Notes or Recommended Actions to Take
	Check select and unselect speaker audio output for clarity	Once per year during the Warranty term		
	Check microphone, headset jacks, foot switches for condition and functionality	Once per year during the Warranty term		

Warranty Plan Definitions

BUSINESS HOURS. Business Hours are defined as 8:00 a.m. to 5:00 p.m. PST, Monday through Friday excluding, national, state, and local holidays.

WASHOE COUNTY. Means “Buyer”, the end-user entity, named in the Agreement, purchasing Services for its own internal use under this Warranty Plan.

DEMAND SERVICES. Means service requests beyond the scope of and not defined in this Warranty Plan. Demand Services may be performed at SERVICE PROVIDER’ rates plus any other applicable expenses, fees, and escalations, as determined by SERVICE PROVIDER. The installation, removal, reinstallation, and/or replacement of equipment not associated with the Services as defined in this Warranty Plan shall be considered Demand Services or Other Services, as applicable. SERVICE PROVIDER has the right to reasonably refuse to provide Demand Services or Other Services. Demand Services may include work performed outside of Business Hours and Other Services, as applicable. Demand Services may be escalated yearly.

DESIGNATED SYSTEM(S). Means the SERVICE PROVIDER system(s) purchased by WASHOE COUNTY and identified in Equipment List for the Software FX SOW. The Designated System does not include Third Party Software products, excluded products or other systems to which the Designated System may be linked.

DIAGNOSTIC FEE. Means the fee that is charged if WASHOE COUNTY disapproves charges to repair and/or replace Equipment upon SERVICE PROVIDER’ determination for repair or replacement of Equipment, as per applicable SOW. SERVICE PROVIDER will charge WASHOE COUNTY a Diagnostic Fee based on the repair facility used and return the unrepaired Equipment to WASHOE COUNTY.

EQUIPMENT. Means the products and related systems, as identified in the Equipment List for which Services are to be provided under and as set forth in this Warranty Plan.

EQUIPMENT LIST. Means the specific, serialized list of Equipment for Services to be provided under and is set forth in this Warranty Plan.

INFRASTRUCTURE. Means the i) Radio Frequency (RF) site (consisting of only a duplexer, combiner, multicoupler, channels, Internet Protocol (IP) channel routers with interface cards, network sentry, Unified Audio Card (UAC), and Mini-Mobility Exchange (MME); ii) the dispatch site (consisting of only IP consoles, IP console switches, IP console routers, IP console internal interface cards, and IP console power supplies; or iii) an Network Switching Center (NSC) site (consisting of only the NSC IP server, storage array, IP router, backup device, firewall, fault management data collection device, and network management pc interface). Infrastructure and respective quantities are specifically itemized in the Equipment List.

NON-SERVICE PROVIDER INFRASTRUCTURE. Means the Equipment not part of Infrastructure or Subscribers. Non SERVICE PROVIDER Infrastructure may comprise of the following: microwave or data transport system components (such as microwave, fiber, multiplexors, and routers), logging recorder timing receiving or generation systems, towers, tower top amplifiers, shelters, fences, landscaping, dehydrators, fuel tanks, bi-directional amplifiers (BDAs), alternating or direct current power systems (uninterruptible power supply (UPS), monitors, inverters, converters, generators, or feeds), heating ventilation air conditioning (HVAC), fire suppression, and/or other environmental monitoring or affecting systems. Non-SERVICE PROVIDER Infrastructure and respective quantities are specifically itemized in the Equipment List.

NON-SERVICE PROVIDER SOFTWARE. Means software whose copyright is owned by a party other than SERVICE PROVIDER or its affiliated companies, including but not limited to the applications, anti-virus updates, operating system patches, and signature files.

OTHER SERVICES. Means Demand Services as requested by WASHOE COUNTY that entail subcontractors, Third Parties, or non-SERVICE PROVIDER services on a time and material basis plus 35%. SERVICE PROVIDER has the right to reasonably refuse to provide Other Services. Other Services may include work performed outside of Business Hours and Demand Services, as applicable.

PREVENTIVE MAINTENANCE. Means tests, checks, and alignment on WASHOE COUNTY's Equipment to ensure that the Equipment meets the specifications of each Equipment's manual.

RESPONSE TIMES. Means the expected timeframe to respond to an unscheduled system problem or outage event as described in the applicable SOW. Response Times are based on the assumption that the site is accessible by normal transportation methods and vehicles. On-site Response Time requirements exclude site locations that require extensive drive time due to traffic conditions, obstructions, distances, or site locations where specialized vehicles are required.

SECURITY UPDATES. Means Software Updates, as stated in the Software FX SOW to the Designated System, that mitigate, address and/or resolve product security vulnerabilities in system components offered by SERVICE PROVIDER, including but not limited to, operating system updates, antivirus signatures, and other security related Windows-based third-party updates (Microsoft security patches, Red Hat Linux security patches, and vulnerability updates for third party products). Security Updates may include Non-SERVICE PROVIDER software patches and/or a work-around.

SECURITY UPDATE MANAGEMENT SERVICE ("SUMS"). Means SERVICE PROVIDER' automated patch management system that provides periodic, security-related Software Updates as stated in the Software FX SOW to the Designated System.

SOFTWARE UPDATES. Means SERVICE PROVIDER provided Software Updates to either SERVICE PROVIDER Designated System components or Security Updates. Updates may contain modifications, enhancements, and/or corrections to existing features, as determined solely by SERVICE PROVIDER. Software Updates means commercially available corrections, modifications, or minor enhancements to the licensed programs generally released and/or provided by SERVICE PROVIDER.

SOFTWARE UPGRADES. Means a major release that replaces the current version of software and provides new features and/or functionality.

SPARE PART(S). Means required additional Equipment to be purchased by WASHOE COUNTY for use to complete repairs of Equipment. Should WASHOE COUNTY not purchase Spare Parts, SERVICE PROVIDER shall not be responsible to provide the Services under the SOWs, in this Warranty Plan that are dependent upon Spare Parts being purchased by WASHOE COUNTY.

SUBSCRIBERS. Means mobile radios, portable radios, control stations, vehicle repeaters, modems, routers, Wi-Fi devices, tablets, or back up dispatch radios that consist of mobile or portable radios as their prime radio transmitter, as listed in the Equipment List.

SUMMARY REPORT. Means communication to indicate action taken in a report to be provided to WASHOE COUNTY within the frequency and intervals, and as exemplified, under the applicable SOW for Services.

TECH-LINK. Means SERVICE PROVIDER' secure web portal containing on-line support tools offered to WASHOE COUNTY as part of the applicable SOW. Access is restricted to authorized WASHOE COUNTYs via user ID and password login.

THIRD PARTY (IES). Means any entity other than SERVICE PROVIDER that provides products or services to WASHOE COUNTY, whether managed by or processed through SERVICE PROVIDER.

Training

Overview

The Training Plan for Washoe County encompasses *Technical and System Management Training*, *Dispatch Equipment Training*, and *User Radio Equipment Training*. Washoe County will receive the training syllabus for approval prior to the start of any training class. Participants will receive and own hard- and soft-copies of the training materials used in class. Additionally, Washoe County may video the training classes for future purposes.

Technical and System Management Training

Technical and System Management Training is comprised of multiple training courses on System Administration, Radio Infrastructure, and Radio Subscribers so that Washoe County can manage, configure and maintain the NSRS. All traditional classroom training will be conducted in Las Vegas and Reno at facilities provided by an NSRS Member on mutually agreeable dates and at the appropriate time during system implementation. Each course will be conducted three times for up to 12 students per session and will be jointly attended by all three Members.

System Administration Training

System Administration Training will be conducted for technical personnel responsible for defining the fleet map and associated properties, planning radio feature usage and personalities, developing operating procedures, maintaining unit and group databases, generating reports, controlling radios (e.g., enabling and disabling units), and monitoring system performance. Figure 1 defines the training program on system administration.

Figure 1. The System Administration Training Program

Course Name	Length	No. of Times Delivered	Total No. of County Students
P25 System Overview	Five 4-hour sessions	3	6
P25 Fleet Mapping Workshop	3 days	3	6
Unified Administration System	2 days	3	6
Regional Network Manager	2 days	3	6
Over-the-Air Rekeying	1 day	3	6

Course Name	Length	No. of Times Delivered	Total No. of County Students
Radio Programming & OTAP	1 day	3	6
ISSI Configuration & Admin.	1 day	3	6

The *P25 System Overview Course* will be delivered using a virtual classroom setting and is limited to four hours each day.

Participants in the System Administration Training Program will receive unlimited access to the following self-paced, web-based training courses for one year beginning the week participants attend the *P25 System Overview* virtual classroom course.

- P25 Fleet Mapping Overview
- Radio Operation
- Symphony Console Operation
- Radio Programming Overview
- Advanced Access Control
- Active Directory
- Activity Warehouse
- Radio Personality Manager (RPM & RPM 2)
- Unified Administration System (UAS) Overview
- Regional Network Manager (RNM) Overview
- Enterprise Network Manager (ENM)
- Over-the-Air Programming (OTAP)
- Over-the-Air Rekeying (OTAR) Fundamentals
- Inter-RF Subsystem Interface (ISSI) Fundamentals

Radio Infrastructure Training

Radio Infrastructure Training provides technicians with the knowledge and skills needed to conduct preventive maintenance, troubleshoot problems, and take corrective action. Figure 2 defines the training program on radio system infrastructure.

Figure 2. The Radio Infrastructure Training Program

Course Name	Length	No. of Times Delivered	Total No. of County Students
P25 System Maintenance	7 days	3	4
Regional Network Manager	2 days	3	4
Network Operation & Maintenance	3 days	3	4
MASTR V Station Maintenance	1½ days	3	4
P25 Simulcast System Maintenance	3 days	3	4

Radio Subscriber Training

Radio Subscriber Training will be provided for technical personnel responsible for programming and maintenance of all user radios. Harris will conduct a five-day *RF Maintenance Course* that provides in-depth discussion and hands-on exercises to maintain the Harris XL family of portable and mobile radios. Technicians and engineers will participate in classroom presentations and discussions on radio programming for testing as well as radio personality modification to meet specific needs. Harris will demonstrate and discuss radio disassembly, and identify field replaceable parts and service tools, in addition to covering individual radio field serviceability plans including field replaceable modules and components. Hands-on exercises will include radio programming, testing, and maintenance to the level authorized by the field serviceability plan.

The *RF Maintenance Course* will be conducted three times for up to 12 students per session and will be jointly attended by all three Members. A total of four Washoe County personnel will participate.

Dispatch Equipment Training

Dispatch Equipment Training consists of *Console Configuration, Operation & Maintenance Training* for dispatch supervisors and maintenance technicians and *Console Operation Refresher Training* for dispatchers.

Console Configuration, Operation & Maintenance Training

This two-day course will provide designated dispatch supervisors and maintenance technicians with the knowledge and skills to configure the Symphony Dispatch Console to meet operational needs, conduct training for dispatchers, and maintain the console. The training will include a detailed operational overview that introduces the various features and capabilities of the console. Participants will work within the Configuration Utility to explore the various settings and how these settings impact the operation of the console. With an understanding of the Configuration Utility settings, participants will have the requisite knowledge to define the parameters that best suit their operational needs. Washoe County will save these settings and use them as a template to set up additional consoles. The remainder of the course involves defining the operating characteristics of the console and using the Configuration Editor to create setups to address the various functions required. This includes adding, renaming and deleting workspace tabs; designing communications modules (i.e., entities, colors, sizes, etc.); adding,

deleting and moving communication modules; changing the sidebar panel layout; creating, switching, deleting and password protecting console setups; and setting encryption indicators and controls, if applicable.

The console operational portion of the training will be conducted using a train-the-trainer approach and includes performing tasks such as selecting communication modules; transmitting and receiving group and individual calls; transmitting, receiving and clearing emergency calls; reviewing call history and playing back audio; modifying communication modules; creating, modifying and transmitting on patches and simulselects; controlling conventional channels; using the paging function; changing console setups; and using special and enhanced console features.

Harris will conduct three training sessions in the Reno/Sparks area. This training will occur approximately two-to-four weeks prior to the start of the performance period. Each training session may have up to six participants.

Console Operation Refresher Training

Harris will provide unlimited access to the web-based *Symphony Console Operation Course* for all Washoe County dispatch personnel for one year beginning after completion of the train-the-trainer courses. Web-based training is hosted by Harris Technical University (HTU). Each student will require a unique e-mail address and create a unique username and password. Students will be able to access transcript information showing course progress and completion status, and print a completion certificate once all course activities are complete.

User Radio Equipment Training

Harris will provide *Radio User Training* based on a train-the-trainer approach. Harris will provide model training and support materials for designated Washoe County trainers to use during the implementation phase. Each train-the-trainer session on radio operation is scheduled for one day and includes an overview of the NSRS P25 radio system, a description of system operation including failure modes, a discussion of radio/system coverage expectations, a discussion and demonstration of the differences between analog and digital voice, a demonstration of basic radio operations including proper radio use, hands-on practice with the radios, and a discussion of basic radio care including battery maintenance.

Harris recommends that Washoe County select trainers from the departments who will use the radio system. The trainers need to be familiar with current operations and aware of any operational issues. Harris will provide customized presentation materials for the instructors and electronic copies of the training materials to allow for additional customization, if desired. Harris will conduct two train-the-trainer sessions approximately two-to-four weeks prior to the start of the performance period. Each session is limited to a maximum of 15 participants. This training will use Harris radios purchased as part of the system.

User Radio Operation Refresher Training

Harris will provide unlimited access to standard web-based radio operation courses for all Washoe County radio users for one year beginning after completion of the train-the-trainer sessions. Web-based training is hosted by Harris Technical University (HTU). Each student will require a unique e-mail address and create a unique username and password. Harris will train and provide a designated individual with administrative rights to the HTU Learning Management System (LMS). The LMS utilizes a tiered structure so that the administrator can create and modify user accounts, distribute account registration links, manage course access, monitor student activity and progress in completing courses, and generate reports.

EXHIBIT B

SOFTWARE LICENSE AGREEMENT

This License Agreement ("License Agreement") is made upon the Effective Date of the Primary Agreement (the "Effective Date") between Harris Corporation, a Delaware Corporation, acting through its Communication Systems Segment, ("LICENSOR") with offices at 221 Jefferson Ridge Parkway, Lynchburg, VA 24501 and Washoe County ("LICENSEE"). LICENSOR is the owner of certain wireless communications software programs and LICENSEE desires to obtain a license from LICENSOR to use such wireless communications programs.

1.0 Definitions.

1.1 "Designated Systems": Means the Harris System(s), products, and Designated Terminals purchased by Buyer and identified in the Primary Agreement for which the Licensed Programs and documentation are intended to be used.

1.2 "Designated Terminals": Means the LICENSOR's Terminals purchased by LICENSEE.

1.3 "Licensed Programs": The term Licensed Programs shall mean the wireless communications computer programs in software or firmware supplied under this License Agreement by LICENSOR in binary object code format to the LICENSEE (stand alone or in conjunction with the purchase of a LICENSOR wireless communications System.) Licensed Programs shall also include all other material related to the Licensed Programs supplied by LICENSOR to LICENSEE hereunder, and which may be in machine readable or printed form, including but not limited to user documentation and/or manuals.

1.4 "Open Source Software": Means software with either freely obtainable source code, license for modification, or permission for free distribution.

1.5 "Open Source Software License": The terms or conditions under which the Open Source Software is licensed.

1.6 "Primary Agreement": The agreement to which this exhibit is attached.

1.7 "Third Party Software Products": Shall mean programs that are not developed by LICENSOR which are licensed / purchased by LICENSOR for inclusion in its products.

2.0 License Grant for Licensed Programs.

2.1 Subject to the Contract and the performance by Licensee of its obligations hereunder, LICENSOR hereby grants to Licensee, and Licensee hereby accepts from LICENSOR, (a) a personal, non-transferable, non-exclusive, perpetual, limited license to use the Licensed Programs in object code format only and (b) install and execute such Licensed Programs on Licensee's equipment and (c) are to be used for internal business purposes only. All licensed programs under this License Agreement shall only be used in conjunction with the Designated System. This license does not transfer any right, title, or interest in the Licensed Programs. The license granted authorizes Licensee to use the Licensed Programs in object code format and does not grant any rights to source code.

2.2 LICENSEE will not reproduce, modify, or make derivative works of the Licensed Programs, except that LICENSEE may make one archival, and one inactive backup, copy of the Licensed Programs. In addition, LICENSEE, its agents, consultants and/or its subcontractors will not attempt to reverse engineer,

decompile, or reverse-compile any software contained in the Licensed Programs and any attempt to do so shall be a material breach of this License Agreement. With respect to the Licensed Programs, LICENSEE will not alter, deface, discard, or erase any media, documentation, or LICENSOR or Third Party Licensor's trademarks or proprietary rights notices.

2.3 Third Party Software Products may be subject to additional license terms, which, if applicable, are set out in Product Specific License Terms delivered with each product. To the extent applicable, LICENSEE shall comply with any additional Third Party Software Product license terms.

2.4 If the Software licensed under this License Agreement contains or is derived from Open Source Software, the terms and conditions governing the use of such Open Source Software are in the Open Source Software Licenses of the copyright owner and not this License Agreement and, to the extent applicable, LICENSEE will comply with the Open Source Software terms License terms. Harris warrants that through the term of this Agreement, that no conflicts exist with the usage of any Open Source Software. If there is a conflict between the terms and conditions of this License Agreement and the terms and conditions of the Open Source Software Licenses governing Licensee's use of the Open Source Software, the terms and conditions of the license grant of the applicable Open Source Software Licenses will take precedence over the license grants in this License Agreement. If requested by Licensee, Harris will use commercially reasonable efforts to: (i) determine whether any Open Source Software is provided under this License Agreement; (ii) identify the Open Source Software and provide Licensee a copy of the applicable Open Source Software License (or specify where that license may be found).

3.0 Protection and Security of Licensed Programs.

LICENSEE acknowledges and agrees that the Licensed Programs and any materials and/or documentation related thereto, and any portion thereof, supplied by LICENSOR hereunder are proprietary and confidential to LICENSOR or applicable third party licensors and are a valuable commercial asset of LICENSOR or their third party owners. LICENSEE also acknowledges and agrees that LICENSOR and/or the third party licensors have and shall retain all proprietary rights in their respective portions of the Licensed Programs and any materials and/or documentation related thereto. LICENSEE (i) shall respect such proprietary rights, (ii) shall protect LICENSOR and any third party licensor's proprietary rights at least to the extent that it protects its own proprietary information, or such (iii) shall not use the Licensed Programs nor any materials or documentation related thereto except for the purposes for which they are being made available as set forth in this License Agreement and (iv) shall not reproduce, print, disclose, or otherwise make said Licensed Programs or materials and/or documentation related thereto available to any third party, in whole or in part, in whatever form, except as permitted in the terms of this License Agreement.

4.0 Warranty

Seller warrants, for the greater of a period of one year or, if a longer Warranty Period for the product containing the Licensed Program is set forth in a Primary Agreement, the longer Warranty Period shall apply commencing with the date of Licensee's Acceptance of their Designated System, that any Licensed Program furnished to Licensee under this License Agreement shall be capable of successfully operating on the Designated System in accordance with the logic defined in the operator's manuals when the System is supplied with correct input data. If, on the basis of evidence submitted to LICENSOR within the term of this warranty, it is shown that any Licensed Program does not meet this warranty, LICENSOR will, at its option, either correct the defect or error in the Licensed Program, free of charge, or make available to Licensee a substitute program. The foregoing warranty is exclusive and in lieu of all other warranties whether written, oral, implied or statutory.

Licensed Programs which have been developed or are owned by a third party licensor and which are sublicensed by LICENSOR to LICENSEE hereunder shall be warranted to LICENSEE only to the extent that the licensor of such sublicensed programs warrants such sublicensed programs to LICENSOR.

In the event that the Licensed Programs do not conform to the representation above, LICENSEE's sole remedy and LICENSOR's sole and exclusive liability shall be to replace such Licensed Programs with the then current released version of such Licensed Programs.

5.0 Limitation of Liability.

5.1 **THE LIMITATION OF LIABILITY PROVISION IN THE PRIMARY AGREEMENT SHALL GOVERN THIS LICENSE AGREEMENT.**

6.0 Term and Termination.

6.1 LICENSOR reserves the right, in addition to any other remedies it may retain in this License Agreement or may be entitled to in law or equity (including immediate injunctive relief and repossession of all non-embedded Licensed Programs and documentation), to terminate this License Agreement at any time prior to the expiration of any Term in the event LICENSEE breaches any material term or condition or fails to perform or observe any obligations or covenants of this License Agreement and such failure and/or breach is not remedied within thirty (30) days of written notice from LICENSOR.

6.2 Within thirty (30) days after termination or expiration of this License Agreement, LICENSEE will return to LICENSOR all confidential material including but not limited to all copies, partial copies, and/or modified copies (if any) of Licensed Programs and any equipment owned by LICENSOR in LICENSEE's possession.

7.0 Assignment/Transfer.

This License Agreement, the licenses granted hereunder and the Licensed Programs provided to LICENSEE under this License Agreement may not be assigned, sub-licensed, or otherwise transferred by LICENSEE to any third party without LICENSOR's prior written consent, except that this license may be assigned if the Products containing the Licensed Programs are transferred but the new owner or user of the Products may only use the Licensed Programs in accordance with terms of this License Agreement. Subject to the foregoing, any assignee hereunder shall be subject to all of the terms, conditions and provisions of this License Agreement. Any attempt by LICENSEE to assign, sub-license, or transfer the Licensed Programs, or any of the rights or duties contained in this License Agreement, without LICENSOR's prior written consent shall be void.

8.0 Severability.

If any provision of this Agreement is held to be illegal, invalid, or unenforceable by a court of competent jurisdiction, the parties shall, if possible, agree on a legal, valid, and enforceable substitute provision that is as similar in effect to the deleted provision as possible. The remaining portion of the Agreement not declared illegal, invalid, or unenforceable shall, in any event, remain valid and effective for the term remaining unless the provision found illegal, invalid, or unenforceable goes to the essence of this Agreement.

9.0 Waiver.

No waiver will be implied from conduct or failure to enforce rights. No waiver will be effective unless in writing signed on behalf of the party against whom the waiver is asserted.

10.0 Compliance with Laws.

Licensee acknowledges that the Licensed Programs are subject to the laws and regulations of the United States and Licensee will comply with all applicable laws and regulations, including export laws and regulations of the United States. Licensee will not, without the prior authorization of Harris and the appropriate governmental authority of the United States, in any form export or re-export, sell or resell, ship or reship, or divert, through direct or indirect means, any item or technical data or direct or indirect products sold or otherwise furnished to any person within any territory for which the United States Government or any of its agencies at the time of the action, requires an export license or other governmental approval. Violation of this provision is a material breach of this License Agreement.

11.0 Governing Law.

This License Agreement is entered into in the State of Nevada and shall therefore be governed by the laws of Nevada without resort to conflict of laws principles. Venue for any legal proceedings shall be in any state or federal court in Washoe County, Nevada, which the Parties agree shall have exclusive jurisdiction over disputes arising out of the interpretation of this Agreement. The terms of the U.N. Convention on Contracts for the International Sale of Goods do not apply. The parties expressly agree that the Uniform Computer Information Transactions Act ("UCITA") applicable in any jurisdiction shall not apply to this License Agreement.

12.0 U.S. Government.
N/A

13.0 Agreement.

This License Agreement may be part of a Primary Agreement between LICENSOR and LICENSEE for the purchased products by LICENSEE from LICENSOR. The Primary Agreement and this License Agreement contain the full understanding of the parties with respect to the subject matter hereof and which supersede all prior understandings and writings relating thereto and which shall become binding on the Effective Date of this License Agreement. No waiver, consent, modification, amendment, or change to the terms of this License Agreement shall be binding unless agreed to in a writing signed by LICENSEE and LICENSOR. If there is any conflict between the terms of the Primary Agreement and this License Agreement as to the Licensed Programs, the terms of the Primary Agreement will prevail.

14.0 Notices.

Notices shall be provided as set forth in the Primary Agreement. In the event there is no notice provision in the Primary Agreement, notices and other communications between the parties shall be transmitted in writing by certified mail or nationally recognized overnight courier service.

15.0 Survival.

Sections 2, 3, 5, 6, 8, 9, 11, and 13 of this License Agreement shall survive termination of this agreement.

[*End of Document*]

EXHIBIT C

FORM OF SURETY BOND FOR PERFORMANCE

PERFORMANCE BOND

Bond No.:

CONTRACTOR:
(Name, legal status and address)

SURETY:
(Name, legal status and principal place of business)

OWNER:
(Name, legal status and address)

CONSTRUCTION CONTRACT
Date:
Amount:
Description:
(Name and location)

BOND
Date:
(Not earlier than Construction Contract Date)

Amount:
Modifications to this Bond: ☐ None ☐ See Section 16

CONTRACTOR AS PRINCIPAL		SURETY	
Company:	*(Corporate Seal)*	Company:	*(Corporate Seal)*
Signature:		Signature:	
Name and Title:		Name and Title:	

(Any additional signatures appear on the last page of this Performance Bond.)

(FOR INFORMATION ONLY — Name, address and telephone)

AGENT or BROKER:

OWNER'S REPRESENTATIVE:
(Architect, Engineer or other party:)

§ 1 The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Owner for the performance of the Construction Contract, which is incorporated herein by reference.

§ 2 If the Contractor performs the Construction Contract, the Surety and the Contractor shall have no obligation under this Bond, except when applicable to participate in a conference as provided in Section 3.

§ 3 If there is no Owner Default under the Construction Contract, the Surety's obligation under this Bond shall arise after

.1 the Owner first provides notice to the Contractor and the Surety that the Owner is considering declaring a Contractor Default. Such notice shall indicate whether the Owner is requesting a conference among the Owner, Contractor and Surety to discuss the Contractor's performance. If the Owner does not request a conference, the Surety may, within five (5) business days after receipt of the Owner's notice, request such a conference. If the Surety timely requests a conference, the Owner shall attend. Unless the Owner agrees otherwise, any conference requested under this Section 3.1 shall be held within ten (10) business days of the Surety's receipt of the

Owner's notice. If the Owner, the Contractor and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Construction Contract, but such an agreement shall not waive the Owner's right, if any, subsequently to declare a Contractor Default;

.2 the Owner declares a Contractor Default, terminates the Construction Contract and notifies the Surety; and

.3 the Owner has agreed to pay the Balance of the Contract Price in accordance with the terms of the Construction Contract to the Surety or to a contractor selected to perform the Construction Contract.

§ 4 Failure on the part of the Owner to comply with the notice requirement in Section 3.1 shall not constitute a failure to comply with a condition precedent to the Surety's obligations, or release the Surety from its obligations, except to the extent the Surety demonstrates actual prejudice.

§ 5 When the Owner has satisfied the conditions of Section 3, the Surety shall promptly and at the Surety's expense take one of the following actions:

§ 5.1 Arrange for the Contractor, with the consent of the Owner, to perform and complete the Construction Contract;

§ 5.2 Undertake to perform and complete the Construction Contract itself, through its agents or independent contractors;

§ 5.3 Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and a contractor selected with the Owner's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the Owner the amount of damages as described in Section 7 in excess of the Balance of the Contract Price incurred by the Owner as a result of the Contractor Default; or

§ 5.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor and with reasonable promptness under the circumstances:

.1 After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, make payment to the Owner; or

.2 Deny liability in whole or in part and notify the Owner, citing the reasons for denial.

§ 6 If the Surety does not proceed as provided in Section 5 with reasonable promptness, the Surety shall be deemed to be in default on this Bond seven days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Section 5.4, and the Owner refuses the payment or the Surety has denied liability, in whole or in part, without further notice the Owner shall be entitled to enforce any remedy available to the Owner.

§ 7 If the Surety elects to act under Section 5.1, 5.2 or 5.3, then the responsibilities of the Surety to the Owner shall not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the Surety shall not be greater than those of the Owner under the Construction Contract. Subject to the commitment by the Owner to pay the Balance of the Contract Price, the Surety is obligated, without duplication, for

.1 the responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;

.2 additional legal, design professional and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Section 5; and

.3 liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor.

§ 8 If the Surety elects to act under Section 5.1, 5.3 or 5.4, the Surety's liability is limited to the amount of this Bond.

§ 9 The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Construction Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators, successors and assigns.

§ 10 The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders and other obligations.

§ 11 Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and shall be instituted within two years after a declaration of Contractor Default or within two years after the Contractor ceased working or within two years after the Surety refuses or fails

to perform its obligations under this Bond, whichever occurs first. If the provisions of this Paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

§ 12 Notice to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears.

§ 13 When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

§ 14 Definitions

§ 14.1 Balance of the Contract Price. The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made, including allowance to the Contractor of any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.

§ 14.2 Construction Contract. The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and changes made to the agreement and the Contract Documents.

§ 14.3 Contractor Default. Failure of the Contractor, which has not been remedied or waived, to perform or otherwise to comply with a material term of the Construction Contract.

§ 14.4 Owner Default. Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

§ 14.5 Contract Documents. All the documents that comprise the agreement between the Owner and Contractor.

§ 15 If this Bond is issued for an agreement between a Contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

§ 16 Modifications to this bond are as follows:

(Space is provided below for additional signatures of added parties, other than those appearing on the cover page.)

CONTRACTOR AS PRINCIPAL		SURETY	
Company:	*(Corporate Seal)*	Company:	*(Corporate Seal)*
Signature:		Signature:	
Name and Title:		Name and Title:	
Address:		Address:	

PAYMENT BOND

Bond No.:

CONTRACTOR:
(Name, legal status and address)

SURETY:
(Name, legal status and principal place of business)

OWNER:
(Name, legal status and address)

CONSTRUCTION CONTRACT
Date:
Amount:
Description:
(Name and location)

BOND
Date:
(Not earlier than Construction Contract Date)
Amount:
Modifications to this Bond: ☐ None ☐ See Section 18

CONTRACTOR AS PRINCIPAL
Company: *(Corporate Seal)*

SURETY
Company: *(Corporate Seal)*

Signature: _____
Name and Title:

Signature: _____
Name and Title:

(Any additional signatures appear on the last page of this Payment Bond.)

(FOR INFORMATION ONLY — Name, address and telephone)

AGENT or BROKER:

OWNER'S REPRESENTATIVE:
(Architect, Engineer or other party:)

§ 1 The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Owner to pay for labor, materials and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference, subject to the following terms.

§ 2 If the Contractor promptly makes payment of all sums due to Claimants, and defends, indemnifies and holds harmless the Owner from claims, demands, liens or suits by any person or entity seeking payment for labor, materials or equipment

furnished for use in the performance of the Construction Contract, then the Surety and the Contractor shall have no obligation under this Bond.

§ 3 If there is no Owner Default under the Construction Contract, the Surety's obligation to the Owner under this Bond shall arise after the Owner has promptly notified the Contractor and the Surety (at the address described in Section 13) of claims, demands, liens or suits against the Owner or the Owner's property by any person or entity seeking payment for labor, materials or equipment furnished for use in the performance of the Construction Contract and tendered defense of such claims, demands, liens or suits to the Contractor and the Surety.

§ 4 When the Owner has satisfied the conditions in Section 3, the Surety shall promptly and at the Surety's expense defend, indemnify and hold harmless the Owner against a duly tendered claim, demand, lien or suit.

§ 5 The Surety's obligations to a Claimant under this Bond shall arise after the following:

§ 5.1 Claimants, who do not have a direct contract with the Contractor,

.1 have furnished a written notice of non-payment to the Contractor, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were, or equipment was, furnished or supplied or for whom the labor was done or performed, within ninety (90) days after having last performed labor or last furnished materials or equipment included in the Claim; and

.2 have sent a Claim to the Surety (at the address described in Section 13).

§ 5.2 Claimants, who are employed by or have a direct contract with the Contractor, have sent a Claim to the Surety (at the address described in Section 13).

§ 6 If a notice of non-payment required by Section 5.1.1 is given by the Owner to the Contractor, that is sufficient to satisfy a Claimant's obligation to furnish a written notice of non-payment under Section 5.1.1.

§ 7 When a Claimant has satisfied the conditions of Sections 5.1 or 5.2, whichever is applicable, the Surety shall promptly and at the Surety's expense take the following actions:

§ 7.1 Send an answer to the Claimant, with a copy to the Owner, within sixty (60) days after receipt of the Claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed; and

§ 7.2 Pay or arrange for payment of any undisputed amounts.

§ 7.3 The Surety's failure to discharge its obligations under Section 7.1 or Section 7.2 shall not be deemed to constitute a waiver of defenses the Surety or Contractor may have or acquire as to a Claim, except as to undisputed amounts for which the Surety and Claimant have reached agreement. If, however, the Surety fails to discharge its obligations under Section 7.1 or Section 7.2, the Surety shall indemnify the Claimant for the reasonable attorney's fees the Claimant incurs thereafter to recover any sums found to be due and owing to the Claimant.

§ 8 The Surety's total obligation shall not exceed the amount of this Bond, plus the amount of reasonable attorney's fees provided under Section 7.3, and the amount of this Bond shall be credited for any payments made in good faith by the Surety.

§ 9 Amounts owed by the Owner to the Contractor under the Construction Contract shall be used for the performance of the Construction Contract and to satisfy claims, if any, under any construction performance bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfy obligations of the Contractor and Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.

§ 10 The Surety shall not be liable to the Owner, Claimants or others for obligations of the Contractor that are unrelated to the Construction Contract. The Owner shall not be liable for the payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligation to make payments to, or give notice on behalf of, Claimants or otherwise have any obligations to Claimants under this Bond.

§ 11 The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders and other obligations.

§ 12 No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the state in which the project that is the subject of the Construction Contract is located or after the expiration of one year from the date (1) on which the Claimant sent a Claim to the Surety pursuant to Section 5.1.2 or 5.2, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this Paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

§ 13 Notice and Claims to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears. Actual receipt of notice or Claims, however accomplished, shall be sufficient compliance as of the date received.

§ 14 When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

§ 15 Upon request by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor and Owner shall promptly furnish a copy of this Bond or shall permit a copy to be made.

§ 16 Definitions

§ 16.1 Claim. A written statement by the Claimant including at a minimum:

.1 the name of the Claimant;
.2 the name of the person for whom the labor was done, or materials or equipment furnished;
.3 a copy of the agreement or purchase order pursuant to which labor, materials or equipment was furnished for use in the performance of the Construction Contract;
.4 a brief description of the labor, materials or equipment furnished;
.5 the date on which the Claimant last performed labor or last furnished materials or equipment for use in the performance of the Construction Contract;
.6 the total amount earned by the Claimant for labor, materials or equipment furnished as of the date of the Claim;
.7 the total amount of previous payments received by the Claimant; and
.8 the total amount due and unpaid to the Claimant for labor, materials or equipment furnished as of the date of the Claim.

§ 16.2 Claimant. An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials or equipment for use in the performance of the Construction Contract. The term Claimant also includes any individual or entity that has rightfully asserted a claim under an applicable mechanic's lien or similar statute against the real property upon which the Project is located. The intent of this Bond shall be to include without limitation in the terms "labor, materials or equipment" that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials or equipment were furnished.

§ 16.3 Construction Contract. The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and all changes made to the agreement and the Contract Documents.

§ 16.4 Owner Default. Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

§ 16.5 Contract Documents. All the documents that comprise the agreement between the Owner and Contractor.

§ 17 If this Bond is issued for an agreement between a Contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

§ 18 Modifications to this bond are as follows:

(Space is provided below for additional signatures of added parties, other than those appearing on the cover page.)

CONTRACTOR AS PRINCIPAL		SURETY	
Company:	*(Corporate Seal)*	Company:	*(Corporate Seal)*
Signature:		Signature:	
Name and Title:		Name and Title:	
Address:		Address:	

EXHIBIT D

INDEMNIFICATION AND INSURANCE SPECIFICATIONS
for Communications Systems Purchase, Construction and Installment

INTRODUCTION

BUYER has established specific indemnification, insurance, and safety requirements for public works construction contracts to help assure that reasonable insurance coverage is purchased and safe working conditions are maintained. Indemnification and hold harmless clauses are intended to assure that SELLER accepts and is able to pay for the loss or liability related to its activities.

INDEMNIFICATION AGREEMENT

Buyer will not waive and intends to assert available NRS chapter 41 liability limitations in all cases.
To the fullest extent of limited liability as set forth in this paragraph SELLER agrees to hold harmless, indemnify, and defend BUYER, its boards, commissions, officers, agents, employees, and volunteers from any loss or liability, losses, damages, costs, expenses, financial or otherwise resulting from any third party claim, demand, suit, action, or cause of action based on bodily injury including death or property damage, including damage to SELLER'S property or injury to SELLER'S employee, caused by any action, either direct or passive, the omissions of SELLER, failure to act, or the willful misconduct of SELLER, or negligence acts on the part of SELLER, its employees, agents, representatives, or Subcontractors arising out of the performance of work under this Agreement by SELLER, or by others under the direction or supervision of SELLER. Buyer agrees to notify Seller in writing as soon as practical of any third-party claim, demand or cause of action for which Buyer will request indemnification from Seller. Buyer will provide Seller with the necessary information and assistance to defend or settle such claim, demand or cause of action. The obligations of Seller under this paragraph shall survive the expiration or termination of this Agreement.

SELLER must either defend BUYER or, upon determination that the work performed by SELLER was negligent in any manner or that SELLER failed to perform any duty set forth in this Agreement, pay BUYER'S costs related to the investigation and defense of any third-party claim, demand, action, or cause of action.

If BUYER'S personnel are involved in defending such actions, SELLER shall reimburse BUYER for the time spent by such personnel at the actual cost incurred by BUYER for such services.

In determining the nature of the claim against BUYER, the incident underlying the claim shall determine the nature of the claim, notwithstanding the form of the allegations against BUYER.

GENERAL REQUIREMENTS

SELLER shall maintain Workers Compensation/Employers Liability, General Liability, Automobile Liability, Property Insurance and Professional Insurance as described below.

WORKERS' COMPENSATION AND EMPLOYER'S LIABILITY

It is understood and agreed that there shall be no Workers' Compensation or Employer's Liability coverage provided for SELLER or any Subcontractor by BUYER. SELLER and their subcontractors agrees, as a precondition to the performance of any work under this Agreement and as a precondition to any obligation of the BUYER to make any payment under this Agreement to provide BUYER with a certificate of insurance

evidencing such coverage meeting the statutory requirements of each state that the SELLER and any of its subcontractors operate in with respect to this Agreement

It is further understood and agreed by and between BUYER and SELLER that SELLER shall procure, pay for, and maintain SELLER's workers' compensation/employer's liability insurance coverage at SELLER'S sole cost and expense.

Should SELLER be self-funded for Workers Compensation, SELLER shall so notify BUYER in writing prior to the signing of this Agreement. BUYER reserves the right to approve said retentions.

SELLER waives all rights against BUYER and its agents, officers, directors and employees for recovery of damages to the extent these damages are covered by the workers compensation and employer's liability or commercial umbrella liability insurance obtained by Contractor pursuant to this agreement.

SCOPE AND LIMITS OF INSURANCE

SELLER shall maintain coverage and limits:

1. Commercial General Liability:

   SELLER shall maintain commercial general liability (CGL) and, if necessary, commercial umbrella insurance with a total limit of not less than $1,000,000 each occurrence _ If such CGL insurance contains a general aggregate limit, it shall be increased to equal twice the required occurrence limit or revised to apply separately to each project or location.

   CGL insurance shall be written on ISO occurrence form CG 00 01 04 13 (or a substitute form providing equivalent coverage) and shall cover liability caused, in whole or in part, by SELLER's premises, operations, independent contractors, products-completed operations, personal and advertising injury, and liability assumed under an insured contract (including the tort liability of another assumed in a business contract). There shall be no specific exclusion with respects to explosion, collapse, underground property damage, or damage to the named insured's work.

   SELLER waives all rights against BUYER and its agents, officers, directors and employees for recovery of damages to the extent these damages are covered by the commercial general liability or commercial umbrella liability insurance maintained pursuant to this agreement.

   SELLER shall maintain commercial general liability (CGL) and, if necessary, commercial umbrella liability insurance, both applicable to liability caused, in whole or in part, by the contractor's completed operations, with a limit of $1,000,000 each occurrence for at least 2 years following substantial completion of the work. Continuing CGL insurance shall be written on ISO occurrence form CG 00 01 (or a substitute form providing equivalent coverage) and shall, , cover liability caused, in whole or in part, by SELLER's products-completed operations and liability assumed under an insured contract. products-completed operations aggregate of at least two times its each occurrence limit.

2. Automobile Liability:

   SELLER shall maintain business auto liability and, if necessary, commercial umbrella liability insurance with a limit of $1,000,000 per occurrence covering <u>any auto (including owned, hired, and non-owned autos) used in the performance of this contract by SELLER.</u>

Business auto coverage shall be written on ISO form CA 00 01, CA 00 05, CA 00 12, CA 00 20, or a substitute form providing equivalent liability coverage If necessary, the policy shall be endorsed to provide contractual liability coverage equivalent to that provided in ISO form CA 00 01.

Pollution liability coverage equivalent to that provided under the ISO pollution liability-broadened coverage for covered autos endorsement (CA 99 48) shall be provided, and the Motor Carrier Act endorsement (MCS 90) shall be attached (if applicable).

SELLER waives all rights against BUYER and its agents, officers, directors and employees for recovery of damages to the extent these damages are covered by the business auto liability or commercial umbrella liability insurance obtained by SELLER pursuant to this agreement.

3. Professional Liability:

SELLER shall maintain professional liability coverage with limits of $1,000,000 per claim with an annual aggregate of $3,000,000 for liabilities arising out of actual or alleged acts, errors and omissions of Seller while performing or failing to perform its professional services as outlined in this contract.

The policy should include coverage for; liabilities arising out of any actual or alleged infringement of copyright by Buyer or a person or entity for whom Buyer is legally responsible relating to software code, user interfaces, or any associated documentation in connection with Buyer's products and professional services as provided in this contract; and arising out of any actual or alleged breach of duty, neglect, error, act, mistake, omission or failure caused, in whole or in part, by Seller's services which results in any of the following:

> An attack that has the intent to affect, alter, copy, corrupt, destroy, disrupt, damage, or provide unauthorized access or unauthorized use of Seller's or Buyer's computer system.

If professional liability coverage is provided on a claims-made or claims made and reported basis, any applicable retroactive or pending and prior litigation exclusion date shall precede the effective date of this agreement. Claims made or claims made and reported coverage shall be maintained for a period of at least six (6) years following completion of all work under this agreement. In the event coverage is cancelled or non-renewed after completion of the work under this agreement, SELLER shall purchase an extended reporting period for a period of at least three (3) years following completion of all work under this agreement.

DEDUCTIBLES AND SELF-INSURED RETENTIONS

SELLER will be financially responsible for any deductibles or self-insured retentions. BUYER reserves the right to request additional documentation, financial or otherwise, prior to executing the underlying agreement.

OTHER INSURANCE PROVISIONS

The policies are to contain, or be endorsed to contain, the following provisions:

1. General Liability and Automobile Liability Coverages

> a. BUYER, its officers, agents, employees, and volunteers are to be included as additional insureds with respect to General Liability and Auto Liability as respects bodily

injury and property damage caused, in whole or in part, by activities performed by or on behalf of SELLER under this agreement, including liability products and completed operations of SELLER; premises owned, occupied, or used by SELLER; or automobiles owned, leased, hired, or borrowed by the SELLER.

b. SELLER'S insurance coverage shall be primary insurance as respects BUYER, its officers, agents, employees, and volunteers. Any insurance or self-insurance maintained by BUYER, its officers, employees, or volunteers shall be excess of SELLER'S insurance and shall not contribute with it in any way.

c. SELLER'S insurance shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer's liability and the rights and duties of Seller as the first named insured on the Seller's policies.

2. Property Coverages

SELLER shall provide and maintain builders risk insurance on the entire work on an "All Risk" basis on a policy form satisfactory to BUYER. The insurance shall apply on a replacement cost basis.

Such builders risk insurance shall include as additional insureds the BUYER and all subcontractors and sub-subcontractors in the work.

Such builders risk insurance shall cover the entire work at the sites identified in this agreement, including reasonable compensation for architects' services and expenses made necessary by an insured loss. Insured property shall include property stored offsite site but intended for use at the site. The policy shall cover the cost of removing debris, including demolition as may be made legally necessary by the operation of any law, ordinance, or regulation.

SELLER shall provide equipment breakdown/boiler and machinery insurance covering insured objects during installation and until final acceptance by BUYER. and other forms of property insurance as appropriate for the project. If any project site(s) are in a flood plain, BUYER reserves the right to require flood coverage at SELLER'S expense. BUYER shall be included as an insured or loss payee as its interests may appear with respect to property insured with respect to this Agreement.

The insurance as required in this section shall be maintained in effect, unless otherwise provided for in the contract documents, until the earliest of the following dates:

(a) the date on which all persons and organizations who are insureds under the policy agree that it shall be terminated;

(b) the date on which final payment, as provided for in Section 9. Payments of this contract, has been made;

(c) the date on which the insurable interests in the property of all insureds other than SELLER have ceased.

SELLER waives all rights against each other and each of their subcontractors, sub subcontractors, officers, directors, agents, and employees, for recovery for damages caused by fire and other perils to the extent covered by builder's risk insurance purchased pursuant to the requirements of this agreement, or any other property insurance applicable to the work.

Partial occupancy or use of the work shall not commence until the insurance company or companies providing insurance required in this section have consented to such partial occupancy or use. SELLER shall take reasonable steps to obtain consent of the insurance company or companies, and agree to take no action, other than upon mutual written consent, with respect to occupancy or use of the work that could lead to cancellation, lapse, or reduction of insurance.

3. All Coverages

SELLER will provide notice of cancellation for all policies as soon as practicable upon receipt of any such notice from its insurers.

ACCEPTABILITY OF INSURERS

Insurance is to be placed with insurers with a Best's rating of no less than A-: VII. BUYER, with the approval of the Risk Manager, may accept coverage with carriers having lower Best's ratings upon review of financial information concerning SELLER and insurance carrier. BUYER reserves the right to require that SELLER'S insurer be a licensed and admitted insurer in the State of Nevada, or on the Insurance Commissioner's approved but not admitted list.

VERIFICATION OF COVERAGE

SELLER shall furnish BUYER with certificates of insurance and with endorsements (Additional Insured for CGL and Auto) affecting coverage required by this exhibit. The certificates and endorsements for each insurance policy are to be signed by a person authorized by that insured to bind coverage on its behalf. ***All certificates and endorsements are to be addressed to the specific BUYER'S contracting department and be received and approved by BUYER before work commences.***

SUBCONTRACTORS

SELLER shall include all Subcontractors as insureds under its policies or shall furnish separate certificates and endorsements for each Subcontractor. All coverages for Subcontractors shall be subject to all of the requirements stated herein. Subcontractors shall ensure that BUYER, its officers, agents, employees, and volunteers are to be included as insureds under subcontractor's Commercial General Liability and Automobile Liability without requiring a direct written contract or agreement between BUYER and each Subcontractor.

MISCELLANEOUS CONDITIONS

1. SELLER shall be responsible for and remedy all damage or loss to property of BUYER, caused in whole or in part by SELLER, any Subcontractor, or anyone employed, directed, or supervised by SELLER under the provisions for the obligations of SELLER under this Agreement.

2. In addition to any other remedies BUYER may have if SELLER fails to provide or maintain any insurance policies or policy endorsements to the extent and within the time herein required, BUYER may, at its sole option:

    a. Order SELLER to stop work under this Agreement and/or withhold any payments which become due SELLER here under until SELLER demonstrates compliance with the requirements hereof; or,

    b. Terminate the Agreement.

SAFETY PROGRAM

SELLER shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the work.

SELLER shall take all necessary precautions for the safety of, and shall provide all necessary protection to prevent damage, injury, or loss to:

1. All employees on the work site and all other persons who may be affected thereby.

2. All the work, materials, and equipment to be incorporated therein, whether in storage on or off the site.

3. Other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction.

SELLER shall comply with all applicable laws, ordinances, rules, regulations, and others of any public authority having jurisdiction for the safety of persons or property or to protect them from damage, injury, or loss. SELLER shall erect and maintain, as required by existing conditions and progress on the work, all necessary safeguards for safety and protection, including posting danger signs, other warnings against hazards, promulgating safety regulations, and notifying owners and users of adjacent utilities. SELLER shall comply with OSHA'S Hazard Communication Standards.

SELLER shall designate a responsible member of its organization at the site whose duty shall be the prevention of accidents. This person shall be SELLER'S superintendent unless otherwise designated in writing by SELLER.

Carol Akers

Subject: FW: NDOT Permission to joinder

From: James Jacklett
Sent: Wednesday, October 10, 2018 10:43 AM
To: Carol Akers
Subject: NDOT Permission to joinder

Carol,
The email below from NDOT provides the authorization to purchase via joinder to Harris Corp.

From: Whalen, James J [mailto:JWhalen@dot.nv.gov]
Sent: Wednesday, October 10, 2018 10:18 AM
To: James Jacklett
Cc: Daniels, Seth L
Subject: RE: RE:

Good Morning James,

NDOT Agreement P697-16-016, ARTICLE XVII – Miscellaneous Provisions, PARAGRAPH 41 allows local government and public safety organizations to use this agreement to purchase Harris equipment and services. NDOT concurs and approves Carson City's request to purchase Harris equipment and services using our agreement.

I you need this approval on offical letter head let me know.

Regards
Jim

Jim Whalen|Technology Manager|Traffic Operations
Nevada Dept of Transportation
Office 775.888.7887
Cell 775.901.0756
jwhalen@dot.nv.gov

SERVICE AGREEMENT

This Agreement, made and entered into on 09/13/2018 , by and between the State of Nevada, acting by and through its Department of Transportation (hereinafter "DEPARTMENT") and HARRIS CORPORATION**,** a Delaware corporation, acting through its Communication Systems Segment, having its principal place of business at is 221 Jefferson Ridge Parkway, Lynchburg, VA 24501 (hereinafter "SERVICE PROVIDER"). Individually they are each a "Party" and collectively they are the "Parties."

WITNESSETH:

WHEREAS, the Director of the DEPARTMENT may, pursuant to Nevada Revised Statutes (hereinafter "NRS") Chapter 333 and Chapter 408, contract for technical services that may be required; and

WHEREAS, NRS Chapter 333 authorizes heads of state departments to contract for the services of independent contractors; and

WHEREAS, the DEPARTMENT has determined that a provision of services is required for the Nevada Shared Radio System (hereinafter "NSRS") Replacement Project (hereinafter "PROJECT"), and as such this PROJECT is necessary to replace the existing NSRS with a Land Mobile Radio System capable of supporting Project 25 (P25) Phase 1 and P25 Phase 2 technologies to include, but not limited to, design, development, deployment, and migration to the new P25 system with minimal interruption of service to the existing mission-critical system. The DEPARTMENT is going to be using State funding for this PROJECT. In the event the DEPARTMENT elects to use Federal funding the Parties agree to amend this Agreement to accommodate additional Federal requirements; and

WHEREAS, the DEPARTMENT, Washoe County, Nevada, a political subdivision of the State of Nevada, and NV Energy, (each are individually a "NSRS Member" and collectively "NSRS Members") previously entered into that certain contract Nevada Shared Radio System Contract, dated as of May 9, 2017 (the "Member Agreement"), pursuant to which the NSRS Members issued a Request for Proposal entitled "REVISED REQUEST FOR PROPOSAL, 697-16-016, Project Specifications and Instructions for Submitting a Proposal to furnish Nevada Shared Radio Replacement Project" (collectively, the "RFP") requesting proposals to provide NSRS Members with a radio communications system and services ("Nevada Shared Radio System" or "NSRS") as set forth in the RFP; and

WHEREAS, the DEPARTMENT has selected SERVICE PROVIDER's Proposal and now desires to enter into this Agreement with SERVICE PROVIDER to provide the DEPARTMENT with the radio communications system and services that the DEPARTMENT requires supporting its obligations under the Member Agreement and as set forth in the Scope of Services attached to this Agreement as Attachment A; and

WHEREAS, the NSRS, when fully implemented for each NSRS Member, will incorporate sub-systems for each NSRS Member, while together operating as an integrated statewide communication system providing communication for all NSRS Members. The NSRS, as designed by SERVICE PROVIDER, will only operate as an integrated statewide communication system when all NSRS Members have contracted with SERVICE PROVIDER to provide each NSRS Members' sub-system of the total system (hereinafter "Shared Regional Implementation"). The NSRS will be implemented for all NSRS Members simultaneously on a regional basis as set forth in the Scope of Services attached to this Agreement as Attachment A; and

WHEREAS, SERVICE PROVIDER's services will be of great benefit to the DEPARTMENT and to the people of the State of Nevada.

NOW, THEREFORE, in consideration of the premises and of the mutual covenants hereinafter contained, it is agreed by and between the Parties as follows:

DEFINITIONS:

As used herein, the terms set forth below shall have meanings set forth below.

A. "Acceptance Tests" shall mean the testing procedures attached to the Scope of Services and mutually agreed upon by the DEPARTMENT and SERVICE PROVIDER to be performed to determine whether the System has met the acceptance criteria either set forth in the Scope of Services, incorporated herein as Attachment A or as mutually agreed upon writing by the DEPARTMENT and SERVICE PROVIDER.

B. "Certificate of Insurance" shall mean the certificate to be provided by SERVICE PROVIDER evidencing the insurance coverage of SERVICE PROVIDER as specified in Article XVII, paragraphs 7-10.

C. "Change Order" shall mean a written modification to the Total Agreement Price, Project Schedule or other Agreement terms, which is signed by both Parties.

D. "DEPARTMENT Encumbered Contract Value" shall mean the Total Agreement Price, including contingency funds as defined in ARTICLE XV, paragraph 7, at Agreement execution or as subsequently modified by a written amendment to this Agreement.

E. "Detailed Design Documents" shall mean those documents deliverable by SERVICE PROVIDER to the DEPARTMENT at the conclusion of the Detailed Design Review described in Article II, paragraph 23 of this Agreement.

F. "Detailed Design Review" or "DDR" shall have the meaning given in Article II, paragraph 23 of this Agreement.

G. "Documentation Deliverables" shall mean the standard commercial quality manuals to be furnished by the SERVICE PROVIDER to the DEPARTMENT pursuant to the terms set forth in Attachment A Scope of Services.

H. "Effective Date of the Agreement" or "Execution Date" shall be the date inserted on the first page of the Agreement.

I. "Expiration Date" shall mean the date on which the Term of this Agreement shall end which shall be the end of the Warranty Period (as defined in Article IX Warranty) except that some other sections of this Agreement may have a later end date for such section when another date is specifically provided in those sections of this Agreement.

J. "Final System Acceptance" shall mean the Final Acceptance for the NSRS pursuant to Article VI, paragraph 5.

K. "Hardware" shall mean, collectively, the Terminal Hardware and Infrastructure Hardware, as defined below.

L. "Infrastructure Hardware" shall mean the equipment, goods, and materials to be supplied by SERVICE PROVIDER for the System infrastructure, as further described in Attachment A Scope of Services.

M. “Project Kick-Off Meeting” shall have the meaning given in Article II, paragraph 20 of this Agreement.

N. "Project Manager" shall mean each respective Party’s duly authorized representative designated to manage each Party’s PROJECT obligations.

O. "Project Schedule" shall mean the schedule attached to the Scope of Services or otherwise mutually agreed upon by SERVICE PROVIDER and the DEPARTMENT in writing for the delivery of the Hardware and/or Software and the performance of the Services described in Attachment A Scope of Services.

P. “Project Sites” shall mean those sites where any construction work is performed or any Infrastructure Hardware is installed under the terms of this Agreement. The term “Project Sites” will include all of the Tower Sites (as defined below).

Q. “Responsibility Matrix” shall mean the table included in Attachment A Scope of Services Exhibit 3 which depicts the roles and responsibilities of SERVICE PROVIDER and the DEPARTMENT set forth in this Agreement.

R. "RFP" shall mean the DEPARTMENT's Request for Proposal as described in the recitals of this Agreement.

S. "Services" or “Work” shall mean the services and work to be provided by SERVICE PROVIDER to the DEPARTMENT included in Attachment A Scope of Services.

T. "Software" shall mean the proprietary computer software of SERVICE PROVIDER as owned exclusively by SERVICE PROVIDER or SERVICE PROVIDER's suppliers, as appropriate, and as further defined in and licensed to the DEPARTMENT pursuant to the terms of the Software License Agreement, incorporated here in as Attachment B.

U. "Software License Agreement" shall mean the System Software License Agreement set forth in Attachment B.

V. "Statement of Work" shall mean the description of the work to be performed by SERVICE PROVIDER to deliver the Hardware, install the System, and provide the Services, all as described in Attachment A.

W. "System" shall mean the radio communications system comprised of the Hardware and Software to be furnished by SERVICE PROVIDER to the DEPARTMENT pursuant to the terms set forth in Attachment A.

X. "Terminal Hardware" shall mean mobile units, portable units, control stations, and related accessories to be provided by SERVICE PROVIDER as listed in Attachment A.

Y. "Total Agreement Price" shall mean the price of the Hardware, the Software license, and the Services to be furnished by SERVICE PROVIDER to the DEPARTMENT pursuant to Article XV, paragraph 2, of this Agreement. The Total Agreement Price may either increase or decrease with the issuance of a Change Order. The Total Agreement Price at Agreement execution does not include contingency funds as defined in ARTICLE XV, paragraph 6.

Z. "Tower Sites" shall mean those sites where equipment will be installed on existing or new towers as included in the SERVICE PROVIDER's Proposal and to be finalized in the Detailed Design Documents or subsequent Change Orders.

ARTICLE I - SCOPE OF SERVICES

1. The SERVICE PROVIDER agrees perform services listed in Attachment A Scope of Services attached hereto and incorporated herein.

2. The SERVICE PROVIDER agrees to furnish all labor, materials, services, equipment, tools, deliver and install the Hardware and Software for the System, and provide the Documentation Deliverables to perform the professional services required under the terms of this Agreement, with the provisions of Attachment A Scope of Services, except as specifically provided otherwise herein.

3. The Detailed Design Documents, as described in Article II, paragraph 23, of this Agreement, and as amended from time to time in writing by the Parties, shall be incorporated into this Agreement after the Detailed Design Documents are approved by the DEPARTMENT and thereafter shall supersede any contrary provisions in Attachment A unless a Change Order specifically modifies any requirement.

4. SERVICE PROVIDER shall commence, carry on, and complete its obligations under this Agreement with all deliberate speed in accordance with the dates set forth in Article II, paragraph 25 Project Schedule and in a sound, economical, and efficient manner, in accordance with this Agreement and all applicable laws. In providing services under this Agreement, SERVICE PROVIDER agrees to cooperate with the various departments, agencies, employees, and officers of the DEPARTMENT.

5. SERVICE PROVIDER agrees to secure at SERVICE PROVIDER's own expense all personnel necessary to carry out SERVICE PROVIDER's obligations under this Agreement. Such personnel shall not be deemed to be employees of the DEPARTMENT nor shall they or any of them have, or be deemed to have, any direct contractual relationship with the DEPARTMENT. SERVICE PROVIDER expressly understands and agrees that the SERVICE PROVIDER is, and shall in all respects be considered, an independent contractor.

ARTICLE II - PERFORMANCE

1. The term of this Agreement shall commence upon the Effective Date and shall terminate five (5) years from the date of FINAL SYSTEM ACCEPTANCE, unless a change extending the term is further agreed to by written amendment signed by all parties to this Agreement and approved by appropriate official action of the governing body of the DEPARTMENT prior to such term expiration date.

2. In the event that the SERVICE PROVIDER performs or causes to be performed any work after: (a) the Agreement's expiration date as set forth within this Agreement, as it may be amended from time to time through written amendment signed by the parties hereto and approved by appropriate official action of the DEPARTMENT's governing body, prior to such expiration date; or (b) termination of this Agreement prior to the expiration date set forth within this Agreement; then the DEPARTMENT shall make no payment for work performed following the expiration or termination dates, and the SERVICE PROVIDER shall forfeit any and all right to payment for such work.

3. The SERVICE PROVIDER, on behalf of itself, its spouses, heirs, executors, administrators, successors, subrogees, servants, insurers, attorneys, independent representatives, personal representatives, agents, and assigns, does hereby waive, release, and

forever discharge the State of Nevada, the DEPARTMENT, and each and every of their departments, divisions, agencies, officers, directors, agents, contractors, and employees, from any and all claims, demands, liens, liability, actions, causes of action, and suits for damages, at law and in equity, in any way connected with or arising from the SERVICE PROVIDER's provision of services and work performed following termination of this Agreement, and/or following the expiration date of this Agreement, as it may be amended from time to time through written amendment signed by the parties hereto and approved by appropriate official action of the DEPARTMENT's governing body, prior to such expiration date.

4. Neither the State of Nevada, the DEPARTMENT, nor any of their departments, divisions, agencies, officers, directors, agents, contractors, and employees, shall have authority to extend this Agreement beyond the expiration date set forth within this Agreement, unless such extension is set forth within a written amendment signed by the parties hereto and approved by appropriate official action of the DEPARTMENT's governing body prior to such expiration date. The SERVICE PROVIDER shall not rely upon any oral or written representations expressed extrinsic to a written amendment signed by the parties hereto and approved by appropriate official action of the DEPARTMENT's governing body prior to such expiration date, purporting to alter or amend this Agreement, including but not limited representations relating to the extension of the Agreement's expiration date.

5. Paragraphs 1 through 5 of this Article II - Performance, shall survive the termination and expiration of this Agreement.

6. The SERVICE PROVIDER shall not proceed with work until the SERVICE PROVIDER receives a written "Notice to Proceed" from the DEPARTMENT. If the SERVICE PROVIDER does commence said work prior to receiving said Notice to Proceed, the SERVICE PROVIDER shall forfeit any and all right to reimbursement for that portion of the work performed prior to said dates. Furthermore, the SERVICE PROVIDER shall not rely on the terms of this Agreement in any way, including but not limited to any written or oral representations and warranties made by the DEPARTMENT or any of its agents, employees, or affiliates, or on any dates of performance, deadlines, indemnities, or any other term contained in this Agreement or otherwise prior to receipt of the Notice to Proceed. In the event the SERVICE PROVIDER violates the provisions of this Section, the SERVICE PROVIDER waives any and all claims and damages against the DEPARTMENT, its employees, agents, and/or affiliates, including but not limited to monetary damages and/or any other available remedy at law or in equity arising under the terms of this Agreement.

The service provider must verify that facilities, infrastructure, and all pre-installation requirements are met prior to mobilization, implementation, and installation of the new P25 system.

7. SERVICE PROVIDER agrees to be subject to liquidated damages for failure to achieve Regional Acceptance in any NSRS Region by the date set forth in this Agreement or a change to the Regional Acceptance Date set forth in any revision to the project schedule, (described in Exhibit 6 Project Schedule), and further agrees that such liquidated damages are intended to be compensatory and do not constitute a penalty for late delivery. The Parties acknowledge and agree that the harm suffered by reason of a failure to achieve a Regional Acceptance by the date set forth in this Agreement would be difficult or impossible to calculate with any certainty and that the liquidated damages set forth below represent a reasonable estimate of that harm. The liquidated damages set forth below are specifically applicable to a failure to obtain Regional Acceptance by the dates set forth in this Agreement only. DEPARTMENT's rights and remedies for other than late delivery are set forth in this Agreement and as are otherwise available at law or equity. If SERVICE PROVIDER fails to meet the schedule date for Regional Acceptance set forth in this Agreement, and after written notice from DEPARTMENT and after thirty (30) calendar day opportunity to cure, the DEPARTMENT may

assess Liquidated Damages against SERVICE PROVIDER as defined below:

i. Damages amount per day ((.005) X (SERVICE PROVIDER's contracted Total Agreement Price of effected NSRS Region)) / 60.

ii. In no event shall the maximum amount of liquidated damages assessed against SERVICE PROVIDER for late deliveries under this Agreement exceed one half of one percent (.005 %) of the Total Agreement Price as agreed to in Article XV, paragraph 2.

iii. Notwithstanding the above, should the Project Schedule change due to a Change Order under this Agreement, the Project Scheduled date for Regional Acceptance may be extended to meet project requirements as mutually agreed by both Parties.

iv. If one of the NSRS Members causes a delay to the schedule, SERVICE PROVIDER agrees to collaboratively draft a Change Order with the other NSRS Members and SERVICE PROVIDER to continue the NSRS Regional Implementation. Such Change Oder shall address any design and project schedule changes needed to effectively partially implement the NSRS Region. The NSRS Member causing the delay shall reimburse SERVICE PROVIDER through such Change Order for any costs including, but not limited to, redesign, remobilization, retesting or any re-execution of any activities defined in the Scope of Work in an NSRS Region where the delay occurred completing the NSRS Region's implementation for SERVICE PROVIDER at a later date. A delayed NSRS Region under this section shall not be subject to future Liquidated Damages. However, in the event that a subsequent revised schedule date is set in an approved Change Order and SERVICE PROVIDER fails to meet such date, it shall be subject to liquidated damages pursuant to this Paragraph 7.

v. SERVICE PROVIDER shall have no liability for liquidated damages for any delay in achieving Regional Acceptance, if, after the Regional Acceptance Date, the delay is attributable to reasons other than SERVICE PROVIDER's delay, including but not limited to delay by NSRS Members and the DEPARTMENT's other service providers, FORCE MAJEURE EVENTS OR OTHER EVENTS BEYOND SERVICE PROVIDER'S REASONABLE CONTROL. However, in the event that a subsequent revised schedule date is set in an approved Change Order and SERVICE PROVIDER fails to meet such date, it shall be subject to liquidated damages pursuant to this Paragraph 7.

8. In the event the DEPARTMENT discovers a SERVICE PROVIDER's error or omission before its discovery by the SERVICE PROVIDER, the DEPARTMENT shall not unreasonably delay in notifying SERVICE PROVIDER of such error or omission. DEPARTMENT's notice to SERVICE PROVIDER shall specify a mutually agreed upon reasonable time period SERVICE PROVIDER will be allowed for correction. The SERVICE PROVIDER shall make all necessary corrections resulting from its errors and omissions, and shall without delay make any corrections necessitated by the negligence, lack of adequate resources, or any other cause within the SERVICE PROVIDER's control, and shall make such corrections without additional compensation. SERVICE PROVIDER shall track all related costs for the correction. Acceptance of the professional services by the DEPARTMENT will not relieve the SERVICE PROVIDER of the responsibility for any subsequent correction of any such errors and omissions, and the clarification of any ambiguities. The SERVICE PROVIDER will be responsible for additional costs in subsequent related construction resulting from its errors or omissions. Should the DEPARTMENT use its own personnel, supplies, or equipment to remedy the deficiency, all such costs incurred by the DEPARTMENT shall be deducted from the sum due or which may become due to the SERVICE PROVIDER. In the event all such costs and charges incurred by the DEPARTMENT exceed the sum which would have been payable under

this Agreement, then the SERVICE PROVIDER shall reimburse the DEPARTMENT the amount of said excess.

9. The SERVICE PROVIDER shall assign one (1) individual throughout the life of this Agreement who shall have overall PROJECT responsibility unless illness or termination requires replacement.

10. A key person is defined as any individual identified by the SERVICE PROVIDER in its proposal as being part of the team to be assigned to the PROJECT. The SERVICE PROVIDER acknowledges and agrees, that the award of this Agreement was based, in part, on its ability to manage the PROJECT, and the qualifications, experience, and capacity of the SERVICE PROVIDER's aforementioned key persons and team. The SERVICE PROVIDER represents, warrants, and covenants that such key persons are and will continue to be available to undertake and perform all services identified herein and fulfill the roles identified in its proposal. The SERVICE PROVIDER shall notify the DEPARTMENT in writing within ten (10) calendar days when a key person leaves the PROJECT team.

a. If a key person leaves the PROJECT team, the SERVICE PROVIDER shall promptly propose a replacement within thirty (30) calendar days to and for the DEPARTMENT's review and written consent.

b. The SERVICE PROVIDER will be deemed to be in breach of this Agreement:

1. If a key person leaves the PROJECT team for a reason other than death, retirement, incapacitation, or leaving SERVICE PROVIDER's employment (including the employment with SERVICE PROVIDER's affiliates, subsidiaries, and parent companies/organizations);

2. If a key person listed by the SERVICE PROVIDER in its proposal to perform or supervise various aspects of design is changed or leaves the PROJECT team.

11. The SERVICE PROVIDER shall at all times maintain control over and have complete responsibility for all services performed pursuant to this Agreement by the SERVICE PROVIDER and any of its subcontractors.

12. The SERVICE PROVIDER warrants that all deliverables and professional services produced under this Agreement shall be completed in a workmanlike manner consistent with standards in the trade, profession, or industry. The standard of care applicable to SERVICE PROVIDER's services will be of the degree of skill and diligence normally employed by service providers performing the same or similar services at the time said services are performed.

13. This Agreement, and any amendments, may be suspended temporarily, either wholly or in part, by the DEPARTMENT upon oral notice confirmed in writing within ten (10) calendar days, when the DEPARTMENT determines that conditions beyond the control of the SERVICE PROVIDER are unfavorable to its satisfactory continuation of work. Should such conditions be encountered, the time for completion may be extended in an amount determined by the DEPARTMENT to be equivalent to the delay. Requests for suspension of time by the SERVICE PROVIDER must have the written approval of the DEPARTMENT. No allowance shall be made for delay or suspension of the services solely due to the fault of the SERVICE PROVIDER.

14. An alteration ordered by the DEPARTMENT which substantially changes the services provided for by the expressed intent of this Agreement will be considered extra professional services, and shall be specified in a written amendment signed by all Parties, which

will set forth the nature and scope thereof. The method of payment for extra professional services shall be specified at the time the amendment is written.

15. The SERVICE PROVIDER shall not assign or subcontract, any of the professional services performed under this Agreement without the prior written approval of the DEPARTMENT through the Subcontractor/Service Provider Request process. The SERVICE PROVIDER will be responsible for any costs or deficiencies resulting from noncompliance of the subcontractors. Any attempted assignment of rights or delegation of duties under this Agreement without the prior written consent of the DEPARTMENT, shall be void.

16. This Agreement shall not become effective until and unless approved by the State Transportation Board.

17. This Agreement is contingent upon the verification that the SERVICE PROVIDER has a valid and active Nevada Business License, and is in good standing in all areas of the Secretary of State's business requirements. If the SERVICE PROVIDER is an out of state provider, the SERVICE PROVIDER must be registered as a foreign business entity equivalent in Nevada, in active status and in good standing.

18. Project Managers. SERVICE PROVIDER shall designate a Project Manager who will lead the SERVICE PROVIDER's team for the System installation project and other Services and Work described in this Agreement (the "PROJECT") and will serve as the DEPARTMENT's primary point-of-contact for SERVICE PROVIDER's project team and the official liaison between SERVICE PROVIDER's project team and the DEPARTMENT. The DEPARTMENT shall designate a Project Manager to function as the single point-of-contact and official liaison between SERVICE PROVIDER's Project Manager and the DEPARTMENT.

19. Project Completion Dates. The Project completion dates are described in the schedule included in Attachment A Scope of Services Exhibit 4 Project Schedule. The Project Schedule may only be modified by mutual written approval of the Parties or as otherwise provided in this Agreement.

20. Project Kick-off Meeting. Promptly after the Effective Date of the Agreement, the SERVICE PROVIDER's Project Manager shall schedule a Project Kick-Off Meeting, the timing and location of which will be mutually agreed upon by SERVICE PROVIDER and the DEPARTMENT. The objectives of this meeting include introduction of all project participants, review of the roles of the project participants, review of the overall project scope and objectives, review of the resource and scheduling requirements, and review of current site status.

21. Site Visits. All existing towers, shelters, and associated equipment provided by or mandated by the DEPARTMENT shall be satisfactory in all manners to accommodate the System proposed by the SERVICE PROVIDER. Following the Effective Date of the Agreement, the DEPARTMENT shall provide SERVICE PROVIDER with access to all Project Sites upon reasonable notice to allow SERVICE PROVIDER to thoroughly examine each Site and to perform the Detailed Design Review, to prepare a schedule of preparatory work required for each site, and prepare a timeline for completion of the preparatory work at each site. At the conclusion of the Site Visits and associated Site surveys and before the conclusion of the Detailed Design Review, DEPARTMENT and SERVICE PROVIDER will mutually agree on any Site work that DEPARTMENT will undertake and be responsible for under this Agreement. Both parties agree to update the contractual documentation reflecting the division of labor between the parties, if any, as it relates to the Sites. The associated funds for any site work not performed by SERVICE PROVIDER will not be paid to SERVICE PROVIDER. Any change of site work from SERVICE PROVIDER to the DEPARTMENT will be reflected in a deductive Change Order.

22. Construction Management Services, Site Preparatory Work. SERVICE PROVIDER shall perform the civil construction services set forth in Attachment A Scope of Services and Exhibit 3 Responsibility Matrix including, but not limited to, the site improvement civil construction to be performed at the identified sites. The DEPARTMENT shall identify and disclose to SERVICE PROVIDER any and all problems or conditions at all Project Sites of which the DEPARTMENT is aware that may affect the Work to be performed by SERVICE PROVIDER under this Agreement.

23. Detailed Design Review. The Detailed Design Review ("DDR") phase will commence after the Effective Date of this Agreement and conclude at a mutually acceptable time to maintain adherence to the Project Schedule. During the DDR, SERVICE PROVIDER's Project Manager will meet with the DEPARTMENT's project team on one (1) or multiple occasions to review the system design, technical data, and site-specific information to confirm and to refine the System and Tower Sites. At the conclusion of the DDR, SERVICE PROVIDER will provide the DEPARTMENT with the following documents (the "Detailed Design Documents") for review and approval by the DEPARTMENT:

- Final Siting Plans
- Project Schedule
- Engineered Site plans (sufficient for the DEPARTMENT to obtain required zoning approvals) and construction drawings for each site
- Shelter Floor Plan Drawings
- Rack Elevation Drawings
- System Block and Level Diagrams
- Power and HVAC Loads
- Antenna Network Diagrams
- Site Frequency Plans (including spectrum analysis and intermodulation studies of existing and proposed frequencies at each site)
- TX Combiner Plan by Site
- Network Backhaul Plans
- Any other documents as mutually agreed upon by the Parties

24. The DEPARTMENT shall have twenty (20) business days to conduct its review of the above documents. Approval of Detailed Design Documents by the DEPARTMENT shall not be unreasonably withheld, conditioned or delayed.

25. Project Schedule. The Project Schedule for the Work is included in Attachment A Scope of Services Exhibit 4 Project Schedule. Updates to the start dates and durations will be made as the information evolves and will be mutually agreed upon by both Parties or updated as otherwise provided herein.

26. System Implementation Communications. SERVICE PROVIDER and the DEPARTMENT shall jointly establish a plan that defines regular meetings, reporting structure, and other communications activities, including working sessions that may be needed throughout the term of this Agreement to plan sub-tasks, including at a minimum: (a) one (1) or more DDR meetings to communicate the final engineering design; (b) formal monthly written reports to the DEPARTMENT's Project Manager concerning work in progress and accomplishments; (c) periodic status meetings at which the parties' Project Managers and other project participants will provide updates; (d) conference calls with SERVICE PROVIDER's and the DEPARTMENT's project teams to discuss tasks, assign responsibility, and establish schedules; and (e) workshops or working sessions that may be needed throughout the Project to plan subtasks.

27. DEPARTMENT Approvals. The DEPARTMENT will review and respond with reasonable promptness to all submittals or other items requiring its approval under this Agreement. For all such submittals or other items the DEPARTMENT will provide the SERVICE PROVIDER with either (i) written notification of the DEPARTMENT's approval, or (ii) a written

notification of conditional approval subject to SERVICE PROVIDER providing prompt correction of any noted deficiency, or (iii) in the case of a submittal that does not meet the requirements of the Agreement, a written notification of the DEPARTMENT's disapproval. The DEPARTMENT's disapproval notification will be provided with reasonable detail to sufficiently advise SERVICE PROVIDER of the basis on which the submittal was determined to be unacceptable. The DEPARTMENT agrees that, except as otherwise provided, failure to provide approval, conditional approval or non-approval of a submittal for which its approval is required within fifteen (15) working days of receipt of the submittal from the SERVICE PROVIDER shall constitute approval of the submittal. The parties agree that this section, article II Performance, does not relate to the Testing and Acceptance procedures in the Regional Testing and Acceptance section of this Agreement.

ARTICLE III - OBLIGATIONS FOR SYSTEM IMPLEMENTATION

The following subsections apply to the Work to be performed under this Agreement.

1. Project Management and Implementation Plan. The DEPARTMENT and SERVICE PROVIDER each agree to perform their respective tasks and obligations pertaining to permits and licenses, Project Site surveys, general Project Site-related responsibilities, general Hardware-related responsibilities, and Project Site-specific responsibilities as set forth in the Scope of Services. The DEPARTMENT's obligations set forth in the Scope of Services shall be performed by the DEPARTMENT in a timely and proper fashion in accordance with the Project Schedule, or as otherwise agreed upon by the DEPARTMENT and SERVICE PROVIDER to allow SERVICE PROVIDER to timely perform its obligations under this Agreement.

2. Access. The DEPARTMENT shall provide access, at no cost to SERVICE PROVIDER, to all owned, leased, or licensed Project Sites at reasonable times, and with an escort (if required), at no charge, upon reasonable prior notification from SERVICE PROVIDER. The DEPARTMENT shall ensure sufficient room, within reason, for construction vehicles used by SERVICE PROVIDER. The DEPARTMENT shall issue temporary identification cards to SERVICE PROVIDER’s personnel and its authorized subcontractors, if required, for access to any of the Project Sites. SERVICE PROVIDER accessing State sensitive facilities unescorted must comply with State Information Security Policies Control Number 105 (Personnel Security) and 106 (Physical Security and Environmental Controls). The DEPARTMENT does not have the resources to escort personnel every day. All communications facilities are considered sensitive areas as they have connectivity to federal and state information systems such as the National Crime Information Center (NCIC) and the Nevada Criminal Justice Information System (NCJIS). SERVICE PROVIDER is required to conduct a background investigation and receive approval from the DEPARTMENT’s Information Security Officer for all SERVICE PROVIDER personnel accessing State sensitive facilities. Only personnel who are approved by the DEPARTMENT’s Information Security Officer who have completed approved background checks, per Attachment C, may access sites.

3. Changes in Sites. Any sites where SERVICE PROVIDER will operate and perform System installation under the terms of this Agreement must be approved by the DEPARTMENT, which approval shall not be unreasonably withheld, delayed or conditioned. Should the DEPARTMENT direct an addition to, removal from, or modification of the list of sites as detailed in this Agreement that affects SERVICE PROVIDER’s cost or schedule or System performance, including, but not limited to, coverage, the Parties agree that such change shall entitle SERVICE PROVIDER to a Change Order and each Party shall attempt, in good faith, to fully negotiate and execute such Change Order prior to commencement of the Work at the changed site.

4. Preparatory Work on Sites. Notwithstanding anything to the contrary contained in this Agreement, the Parties agree that some Project Sites may require tower replacement or

modifications, as well as related permitting and licensing for Work and/or obtaining physical real estate space. As stated in the Responsibility Matrix, the DEPARTMENT shall be responsible for securing all necessary site zoning, site access, or other permits (including, but not limited to, easements, impact studies, planning commission approval, variances, etc.) necessary for the Work, whether required by federal, state, or local authorities, with SERVICE PROVIDER assisting by providing information and any required civil engineering drawings. The DEPARTMENT shall also have the responsibility to secure by lease, purchase, easement or otherwise all rights and access to selected sites or additional real estate as may be required. The DEPARTMENT also shall be responsible for paying all utility charges to the appropriate utility for providing utility services to the System installation areas. The Parties agree to mitigate the need for tower replacement or modification to the extent practical. If any unanticipated tower replacements become necessary, SERVICE PROVIDER is entitled to an extension of time for any impacted activities and/or an equitable adjustment to the Total Agreement Price to maintain the Project Schedule.

5. Frequency FCC Licensing. The DEPARTMENT will be responsible for obtaining all Federal Communications Commission (FCC) frequency licenses for the System, with SERVICE PROVIDER providing technical assistance and information as set forth in Attachment A. SERVICE PROVIDER has no responsibility or obligation to secure licensed frequencies. In the event the DEPARTMENT fails to obtain FCC licenses, and such failure has a material impact on the cost of Work performed by SERVICE PROVIDER under the Agreement and/or the schedule, the Parties agree that SERVICE PROVIDER shall be entitled to an equitable adjustment to the Project Schedule, Total Agreement Price, or other Agreement terms and that a Change Order shall be agreed to by the Parties.

6. Federal Aviation Administration (FAA) Approvals. The DEPARTMENT will be responsible for obtaining all FAA approvals for newly-constructed or modified towers.

7. Contractor Licenses. SERVICE PROVIDER will be responsible for obtaining all contractor licenses required for the performance of its duties and obligations.

ARTICLE IV - DELIVERY, TITLE AND RISK OF LOSS

1. Infrastructure Hardware. SERVICE PROVIDER shall ship the Infrastructure Hardware to the DEPARTMENT at the DEPARTMENT's expense on or before the dates set forth in the Project Schedule. Partial deliveries shall be permitted. Upon delivery to the first carrier, title to each portion of the Hardware and all risk of loss or damage shall pass to the DEPARTMENT. Infrastructure Hardware may be shipped directly to the DEPARTMENT or to a mutually agreed upon staging or storage location. As the DEPARTMENT is self-insured, it shall keep the Hardware secure and fully insured for the total amount of all monies then due for the respective Hardware, or yet to become due, to SERVICE PROVIDER with respect to this Agreement.

2. Terminal Hardware. SERVICE PROVIDER shall ship the Terminal Hardware to the DEPARTMENT at the DEPARTMENT's expense on or before the dates set forth in the Project Schedule. Partial deliveries shall be permitted. Upon delivery to the first carrier, title to each portion of the Hardware and all risk of loss or damage shall pass to the DEPARTMENT.

3. If the DEPARTMENT fails to take delivery of any of the Hardware, SERVICE PROVIDER may place such Hardware in storage at the place of manufacture or elsewhere. In such event: (1) SERVICE PROVIDER shall notify the DEPARTMENT of the placement of any Hardware in storage; (2) SERVICE PROVIDER's delivery obligations shall be deemed fulfilled and title and all risk of loss or damage shall thereupon pass to the DEPARTMENT; (3) any amounts otherwise payable to SERVICE PROVIDER upon delivery shall be payable upon presentation of SERVICE PROVIDER's invoices therefor; and (4) promptly upon submission of

SERVICE PROVIDER's invoices therefor, the DEPARTMENT shall reimburse SERVICE PROVIDER for all expenses incurred by SERVICE PROVIDER, such as preparation for and placement into storage, handling, storage, demurrage, inspection, preservation, and insurance.

ARTICLE V - CHANGES AND ADDITIONS

The following sections pertain to the Change Order Policy as identified herein, and as attached in Attachment D Change Order Policy.

1. Hardware Changes. In the event of any change in the Hardware as a result of the imposition after the Effective Date of this Agreement of any requirements by any federal, state, or local government, an equitable adjustment in the price shall be made to reflect any added cost and expense of such change, and this Agreement shall be modified in writing accordingly.

2. DEPARTMENT Requested Changes. The DEPARTMENT may request changes in or additions to the Work or in the time or place of performance of the Work under this Agreement. If any such change causes an increase or decrease in the cost of, or the time required for, performance of any part of the Work under this Agreement, SERVICE PROVIDER shall be entitled to an equitable adjustment, by Change Order, in the Total Agreement Price, the Project Schedule, or both. Any such adjustment in the Total Agreement Price or Project Schedule shall be mutually satisfactory to the DEPARTMENT and SERVICE PROVIDER. Price increases and/or extensions of time shall not be binding upon either Party unless and until evidenced by a Change Order signed by the Parties hereto.

3. DEPARTMENT Delays in Performance. To the extent that the DEPARTMENT fails to timely perform its obligations under the Responsibility Matrix or otherwise under this Agreement, and such failure has a material impact on the cost of Work performed by SERVICE PROVIDER under this Agreement and/or the schedule, the Parties agree that SERVICE PROVIDER shall be entitled to an equitable adjustment to the Project Schedule, the Total Agreement Price, or both and that a Change Order shall be agreed to by the Parties.

4. Concealed Conditions. If, following the DEPARTMENT’s acceptance of the Detailed Design Documents, SERVICE PROVIDER encounters a concealed condition of which it had no reason to be aware, at one (1) or more Project Sites, then the Parties agree to work together to determine the best course of action and agree to negotiate in good faith a Change Order and an equitable adjustment to the Project Schedule and/or Total Agreement Price.

5. Product Discontinuance. Subject to its obligation to fulfill its obligations set forth in the Agreement, SERVICE PROVIDER reserves the right to change or to discontinue any product covered by this Agreement provided that SERVICE PROVIDER agrees to make available to the DEPARTMENT a functionally equivalent replacement product equal to or better than the product discontinued.

6. Frequency Support and Frequency Changes. SERVICE PROVIDER shall reasonably support the DEPARTMENT in submitting the DEPARTMENT’s frequency licensing applications to the Regional authorities and the Federal Communications Commission for this PROJECT. In the event that, after all commercially reasonable efforts and due diligence have been expended, the DEPARTMENT cannot obtain all of the necessary United States government approvals for the frequency plan as described in Attachment A and this Agreement, it shall be treated as an excusable delay event pursuant to the Excusable Delays section of this Agreement for which an extension to the Project Schedule shall be granted, and SERVICE PROVIDER will diligently and expeditiously prepare and provide to the DEPARTMENT a System re-design for its review and approval, including all price and schedule changes. Notwithstanding anything to the contrary contained in this Agreement, the Parties agree that SERVICE PROVIDER may be entitled to an equitable adjustment to the Total Agreement Price and/or the

Project Schedule for SERVICE PROVIDER's services on any such System re-design. In the event that the DEPARTMENT and SERVICE PROVIDER cannot mutually agree on the System re-design, either party may then terminate this Agreement on thirty (30) calendar days written notice to the other Party.

7. The Parties agree that a Change Order may alter or modify the terms of this Agreement and shall have the same effect as an amendment to this Agreement. However, increases to the DEPARTMENT Encumbered Contract Value must be processed through a written amendment to this Agreement. Such Change Order shall specify which terms and conditions have been modified throughout the Agreement where applicable. The Parties agree that any and all defined words or phrases in the Agreement will apply equally throughout any Change Order or amendment. The terms set forth in this Agreement shall remain in full force and effect unless altered by a Change Order or amendment.

ARTICLE VI - TESTING AND ACCEPTANCE

1. NSRS Regional Implementation: An NSRS Region means those three (3) divisions as defined in Figure 1 - NSRS Regional Map, contained in Exhibit 10 Project Implementation Plan ("NSRS Region"). Each NSRS Region will be implemented simultaneously for each NSRS Member. The DEPARTMENT and SERVICE PROVIDER agree that the Project will begin by performing the System Implementation project tasks on an NSRS Region by NSRS Region Basis at the direction of the NSRS Members. The Infrastructure Hardware and associated Software for each NSRS Region shall meet the requirements for the Factory Testing Phase defined below prior to the shipment of the hardware. The DEPARTMENT, other NSRS Members and SERVICE PROVIDER will have developed and agreed upon an Acceptance Testing Plan for each NSRS Region by the end of the Detailed Design phase of the Project.

2. The Factory Testing Phase: For each NSRS Region, the Factory Testing Phase, NSRS Members and SERVICE PROVIDER shall approve a Factory Acceptance Test Plan ("FATP"), which shall include visual inspections, verification of electrical parameters of the Hardware and associated Software, functional tests, system resiliency, and other aspects of the Hardware and associated Software or systems, conducted in accordance with standards of good engineering practice and including such other quality control and product approval procedures as the manufacturer normally conducts on such Hardware and associated Software, to determine whether the Hardware and associated Software meets its Specifications according to the FATP. For each NSRS Region, the Factory Test Phase shall be conducted by SERVICE PROVIDER and observed by the DEPARTMENT on Hardware it manufactures in addition to third party products in the design. Such processes and results of such tests shall be documented and the documentation for each piece of Hardware and associated Software shall be provided to the DEPARTMENT and NSRS Members within fourteen (14) calendar days of the date the Hardware is shipped to Nevada. The presentation of such documentation by SERVICE PROVIDER or SERVICE PROVIDER's supplier to the DEPARTMENT shall constitute SERVICE PROVIDER's representation that the statements in the documents are true and correct, and that the factory testing and acceptance according to the FATP for such Hardware and associated Software have been met. The shipment of Hardware for installation shall also constitute SERVICE PROVIDER's representation that the FATP for such Hardware and associated Software have been met. No Hardware shall be shipped or installed before it has met the FATP. NSRS Members and SERVICE PROVIDER shall jointly commence the Acceptance Tests on a mutually agreeable date and a representative of SERVICE PROVIDER and a representative of each NSRS Member shall sign off on the form provided as part of the test procedure whether each item of the test was passed or failed.

3. Regional Acceptance Testing: SERVICE PROVIDER shall notify the DEPARTMENT and the other NSRS Members that an NSRS Region is ready for Acceptance Tests at least fifteen (15) working days before commencement of the Acceptance Tests. Acceptance Testing is defined as set out in Exhibit 8 Functional Acceptance Test Procedures,

and Exhibit 9 Coverage Character Test Procedures, and shall include such other tests and procedures as the DEPARTMENT or other NSRS Members may reasonably request during the development of the Acceptance Testing Plan during the Detailed Design Phase of the project. NSRS Members and SERVICE PROVIDER shall jointly commence the Acceptance Tests on a mutually agreeable date and a representative of SERVICE PROVIDER and a representative of each NSRS Member shall sign off on the form provided as part of the test procedure whether each item of the test was passed or failed. If the NSRS Region does not fulfill the requirements of the Acceptance Tests, and the failure is solely attributable to SERVICE PROVIDER's obligations under this Agreement, SERVICE PROVIDER shall promptly correct the defects at no additional cost to the DEPARTMENT and other NSRS Members as needed. Upon correction of the defects the Acceptance Tests for the applicable part of the NSRS Region shall be repeated in accordance with the procedures set forth in this Section and the Acceptance Testing Plan. Successful completion of the Acceptance Tests for an NSRS Region is the sole criterion for technical NSRS Regional Acceptance ("Regional Acceptance") and the initiation of the Warranty Period, defined in Article XV Warranty, with respect to the NSRS Region. For avoidance of doubt, initially, the first NSRS Region will be implemented and tested. Next, the second NSRS Region will be implemented. During the testing of the second NSRS Implementation Region, the previously implemented NSRS region will be tested for integration. Next, the third NSRS Region will be implemented. During the testing of the third NSRS Implementation Region, the previously implemented NSRS regions will be tested for integration.

4. 30-Day Operational Burn-in Phase: The 30-Day Operational Burn-Test for each NSRS Region shall follow immediately after the successful completion of Regional Acceptance for each NSRS Region. During this time, representatives of SERVICE PROVIDER, the DEPARTMENT and other NSRS Members shall observe the test procedure as defined in Exhibit 8 Functional Acceptance Test Procedures. The 30-Day Operational Burn-in Phase will last for thirty (30) consecutive calendar days but shall run anew in the event of a Major Failure as defined in the Acceptance Test Plan, with the 30-day clock restarting after SERVICE PROVIDER has corrected the cause of the Major failure, which SERVICE PROVIDER shall correct at SERVICE PROVIDER's expense.

5. Final System Acceptance: Final Acceptance for the NSRS shall occur when (i) Regional Acceptance has occurred for each NSRS Region including the 30-Day Operational Burn-In Test, (ii) the Hardware and Software for the System, and Services have been furnished, delivered, installed, (iii) SERVICE PROVIDER has furnished the DEPARTMENT with all document deliverables, and (iv) SERVICE PROVIDER and the DEPARTMENT agree on a list of nonservice affecting defects in the appearance, operation or installation of the Hardware (the "Punch List") which SERVICE PROVIDER shall promptly resolve.

6. Preplanning Regional Acceptance Meeting: When the DEPARTMENT or any NSRS Member recognizes that they cannot meet a contractual obligation for performance under their respective Agreement with SERVICE PROVIDER, including but not limited to slippage in the Project Schedule, obligations under the Responsibility Matrix, or other material changes such that any region cannot be implemented per the Project Schedule, SERVICE PROVIDER and all NSRS Members shall meet to mutually agree on a Change Order. Such Change Order may affect the planned Coverage or other technical requirement for the NSRS region under implementation and may result in a modification to the Coverage Guarantee for that NSRS Region. The Change Order shall ensure the continuation of the implementation of the NSRS Region in a timely manner so as not to delay the overall implementation for all NSRS Members.

7. Notwithstanding the acceptance testing of the NSRS Regions set forth in Paragraph 3 of this Article VI, and the exclusion of the installation of the shared Connect Cores as defined in Exhibit 10 Project Implementation Plan, if the DEPARTMENT commences use of any portion of the System in an NSRS Region for its intended purpose, other than for the express purpose of training, testing, or Pre-acceptance Site Usages as mutually agreed upon by

SERVICE PROVIDER and the DEPARTMENT in writing, prior to Regional Acceptance of that NSRS Region, the applicable portion of the purchase price for that NSRS Region shall be due and payable and the NSRS Region will be deemed accepted. The Warranty Period for the applicable portion of the System put into use together with the associated installation Services shall be deemed to have commenced concurrently with the use of the applicable portion of the System for its intended purpose. The use of the applicable portion of the System for its intended purpose shall be deemed to have occurred when the DEPARTMENT commences to use and rely primarily on the applicable portion of the System for its communications.

8. Pre-acceptance Site Usage: Before Regional Acceptance has occurred in any Region, DEPARTMENT may begin using completed sites with written approval of SERVICE PROVIDER for DEPARTMENT defined pre-acceptance testing or non-critical communication needs during transitional period of implementation. DEPARTMENT acknowledges that before Regional Acceptance has occurred that the sites operating in such region are not fully operational as designed and that certain anomalies may occur including, but not limited to, occurrences of the following: dropped calls, unplanned system interruption, or variance in coverage from the guaranteed coverages in this Agreement. DEPARTMENT AGREES ONLY TO ALLOW NON-PUBLIC SAFETY USERS TO USE A SITE BEFORE REGIONAL ACCEPTANCE AND WILL NOT ALLOW PUBLIC SAFETY USERS OR FIRST RESPONDERS TO USE A SITE BEFORE REGIONAL ACCEPTANCE AND WILL NOT ALLOW ANY USE BEFORE REGIONAL ACCEPTANCE REQUIRING FAIL-SAFE, EMERGENCY OR MISSION CRITICAL PERFORMANCE IN WHICH THE FAILURE OF THE EQUIPMENT COULD LEAD TO DEATH, PERSONAL INJURY, PHYSICAL OR ENVIRONMENTAL DAMAGE. DEPARTMENT ACCEPTS ALL RESPONSIBILITY AND LIABILITY FOR RADIO SYSTEM USAGE BEFORE REGIONAL ACCEPTANCE. During any period in which Pre-acceptance Site Usage is granted by SERVICE PROVIDER to DEPARTMENT, DEPARTMENT acknowledges that SERVICE PROVIDER has no liability to keep sites operational and Coverage will not be guaranteed until Regional Acceptance is complete. Further, DEPARTMENT acknowledges that site or system outages will occur, and that SERVICE PROVIDER has no commitment to inform DEPARTMENT of any such outages, however if planned outages are expected SERVICE PROVIDER shall notify System Administrator twenty-four (24) hours in advance. To ensure the continuation of the implementation of the NSRS Region in a timely manner so as not to delay the overall implementation for all NSRS Members, SERVICE PROVIDER shall have no obligation to support users operating on any Pre-acceptance Site.

9. As used in this Agreement, the term "Regional Acceptance Date" shall mean the date of "Acceptance" of one (1) of the NSRS Regions, which shall be deemed to occur upon the earlier of: (1) the date on which the NSRS Region is deemed accepted pursuant to Paragraph 3 of this Article VI above, or (2) the date on which the Region is deemed accepted pursuant to Paragraph 7 of this Article VI above.

10. Commitments and Assumptions.

(i) SERVICE PROVIDER will provide a Testing Coordinator who will establish the approach, reasonably acceptable to the Parties, to measure, record, and report progress on all testing activities.

(ii) SERVICE PROVIDER will ensure the technical environment is set up to support each round of testing.

(iii) Testing activities for each portion of the PROJECT will be completed in accordance with the Acceptance Testing Plans.

(iv) SERVICE PROVIDER will promptly provide a written summary of each round of comprehensive Acceptance Testing.

(v) All Acceptance Testing will be performed by SERVICE PROVIDER with the cooperation and under the observation and supervision of the DEPARTMENT and other NSRS Members.

ARTICLE VII – SOFTWARE LICENSE

1. Subject to the terms and conditions of the Software License Agreement, incorporated herein as Attachment B, the DEPARTMENT is granted a license to use the Software only in conjunction with the System purchased under this Agreement. "Software" means the "Licensed Programs" as defined in Attachment B Software License Agreement.

ARTICLE VIII - COVERAGE

1. SERVICE PROVIDER's representations concerning the distance at which usable radio signals will be transmitted and received by Hardware supplied hereunder are set forth in the Attachment A. Coverage for the System shall be measured as provided in Article VI Testing and Acceptance.

ARTICLE IX – WARRANTY

1. Hardware and Services

The warranties for the System, including all Services, Software and Hardware, set forth in this Agreement shall begin on the date of the first NSRS Regional Acceptance Date and continue for a period of one (1) year following Acceptance of the last NSRS Region implemented (the "Warranty Period"). SERVICE PROVIDER warrants for the Warranty Period, that the Hardware and installation Services furnished by SERVICE PROVIDER under this Agreement, and further specified in Exhibit 11 Warranty Plan, shall be new, free from defects in material and workmanship and shall conform to the Agreement specifications. Any Services provided during the Warranty Period are set forth in Attachment A. Any and all claims for breach of this warranty are conclusively deemed waived unless made within the Warranty Period. The warranty period for additional Hardware purchased by the DEPARTMENT from the SERVICE PROVIDER after System Acceptance shall be warranted for the following periods of time from the date the Hardware is delivered to DEPARTMENT:

a. For mobile and portable radios ("Subscriber Units"), twenty-four (24) months.

b. For all other Hardware, one (1) year.

2. Subscriber Units: Subscriber Unit warranty period shall begin at the date put into service and run for a period of twenty-four (24) months. Subscriber Unit accessories, including batteries, are warranted for a period of one (1) year. For purposes of this Warranty the Subscriber Unit's batteries supplied by SERVICE PROVIDER shall be deemed defective if: (1) the battery capacity is less than eighty percent (80%) of rated capacity, or (2) the battery develops leakage. Replacement batteries shall be warranted only for the remaining unexpired portion of the Warranty Period. This warranty becomes void if: (1) the battery has been subjected to any kind of misuse, detrimental exposure, or has been involved in an accident, or (2) the battery is used in equipment or service other than the Hardware for which it is specified.

3. During the Warranty Period if any component of the Hardware or portion of the installation Services fails to meet the foregoing warranties, SERVICE PROVIDER's sole obligation and DEPARTMENT's exclusive remedy under this warranty shall be the correction by SERVICE PROVIDER of the failure at SERVICE PROVIDER's option: (1) by repairing any defective component of the Hardware, or (2) by furnishing any necessary repaired or replacement parts, (3)

by the redoing of the faulty installation, or replacement per sections 4, 5, or 6 below. Any such failure, or the repair or replacement of the defective component or the redoing of any installation, shall not extend the Warranty Period. Where such failure cannot be corrected by SERVICE PROVIDER's reasonable efforts, the Parties will negotiate an equitable adjustment in price. SERVICE PROVIDER will be responsible for all charges incurred in returning defective parts to SERVICE PROVIDER's plant and shipping repaired or replacement parts to DEPARTMENT. All warranty labor must be performed by an authorized service group approved by SERVICE PROVIDER either at its place of business, for mobile or portable equipment, or at the DEPARTMENT's location for fixed location equipment should SERVICE PROVIDER determine that it is not feasible to return the fixed location equipment to SERVICE PROVIDER's authorized service group.

4. SERVICE PROVIDER Manufactured Infrastructure Equipment – Defects & Recurring Failures - Any SERVICE PROVIDER manufactured fixed equipment or SERVICE PROVIDER manufactured fixed equipment module that fails twice during the acceptance test or twice during the first twelve (12) months after System Acceptance shall be indicative of a recurring or systemic failure or defect that warrants further investigation by the SERVICE PROVIDER and NSRS Members. If the defect is deemed by the NSRS Members and SERVICE PROVIDER to be systemic after the investigation is completed, the SERVICE PROVIDER shall then be responsible for replacing at no additional cost to the NSRS Members all components and/or equipment that is deemed to be causing the systemic failure.

If, during the first five (5) years after Final System Acceptance, ten percent (10%) of a single type of SERVICE PROVIDER manufactured component, equipment or material fails, an investigation by the SERVICE PROVIDER and NSRS Members will be performed on any such failed component, equipment or material. If such failure is deemed by NSRS Members and SERVICE PROVIDER to be due to a product defect, SERVICE PROVIDER shall replace one hundred percent (100%) of this type of component, equipment or material NSRS-wide at no additional cost to the NSRS Members, regardless of whether or not it has failed, including any component, equipment or material previously replaced.

5. SERVICE PROVIDER Manufactured Dispatch Equipment – Defects & Recurring Failures - If ten percent (10%) SERVICE PROVIDER Manufactured of console equipment that fails for the same reason during the acceptance test or during the first twelve (12) months after equipment acceptance shall be indicative of a recurring or systemic failure or defect that warrants further investigation by the SERVICE PROVIDER and the concerned NSRS Member. If the defect is deemed by NSRS Member and SERVICE PROVIDER to be systemic after the investigation is completed, the SERVICE PROVIDER shall then be responsible for replacing at no additional cost to the NSRS Member all SERVICE PROVIDER Manufactured console equipment related to the recurring or systemic failure, not only the specific equipment affected.

6. SERVICE PROVIDER Manufactured Subscriber Unit Equipment – Defects & Recurring Failures - If ten percent (10%) SERVICE PROVIDER Manufactured of Subscriber Unit equipment that fails for the same reason during the acceptance test or during the first twelve (12) months after equipment acceptance shall be indicative of a recurring or systemic failure or defect that warrants further investigation by the SERVICE PROVIDER and the concerned NSRS Member. If the defect is deemed by NSRS Member and SERVICE PROVIDER to be systemic after the investigation is completed, the SERVICE PROVIDER shall then be responsible for replacing at no additional cost to the NSRS Member all SERVICE PROVIDER Manufactured Subscriber Unit equipment related to the recurring or systemic failure, not only the specific equipment affected.

7. NSRS Member Performed Warranty Repair - The NSRS Members shall have the right to perform any maintenance and/or repairs required during the warranty period without voiding or affecting the SERVICE PROVIDER's warranty. NSRS Member technicians that

complete the repairs must have taken all training classes outlined by SERVICE PROVIDER in Attachment A, Exhibit 11 Warranty Plan. otherwise the work will void the warranty for said component. If NSRS Member work causes further system issues because of improper or negligent repair and a deeper level of SERVICE PROVIDER support is required, SERVICE PROVIDER, may charge the responsible NSRS Member for such additional support if requested.

8. Any additional purchases of equipment, including radios, and installation services which may be purchased by NSRS Members and delivered or performed by SERVICE PROVIDER after Final System Acceptance, shall be warranted on the same terms, limitations, and exclusions as are set forth herein, except that the warranty on the equipment and installation services shall be for a period of two (2) years for additional Subscriber Units items from the date of delivery of that item of equipment, one (1) year for additional Infrastructure Hardware items from the date of delivery of that item of equipment, and one (1) year from the date of completion of that installation service.

9. SERVICE PROVIDER's obligations shall not apply to:

a. Hardware or components thereof which are normally consumed in operation, or

b. Defects which are the result of improper storage, use, or installation performed by other than SERVICE PROVIDER, maintenance performed by other than SERVICE PROVIDER, or repair performed by other than SERVICE PROVIDER, or

c. Hardware which has been subjected to any other kind of misuse or detrimental exposure or has been involved in an accident, or

d. Hardware or installations altered or repaired by any party other than SERVICE PROVIDER without SERVICE PROVIDER's prior written consent.

10. While on NSRS Member's premises, SERVICE PROVIDER, its agents, employees, or Subcontractors shall conform in all respects with physical, fire, or other security regulations, and shall comply with 29 CFR §1910 General Industry, 29 CFR §1926 Construction Industry, and NRS Chapter 618. SERVICE PROVIDER shall be responsible for care of DEPARTMENT's equipment and any damage to facilities during servicing.

11. Coverage and System Integration Warranty. Notwithstanding the other provisions of this Section Warranties, SERVICE PROVIDER's only Warranty as to radio coverage is that the System, prior to Regional Acceptance, shall have successfully passed the coverage tests in the Acceptance Test Plan. This Warranty is operative only when the Shared Regional Implementation occurs. For Coverage and System Integration purposes, the Testing and Acceptance section of this Agreement defines on a Regional basis, that if the NSRS Region does not fulfill the requirements of the Acceptance Tests, and the failure is solely attributable to SERVICE PROVIDER obligations under this Agreement, SERVICE PROVIDER shall promptly correct the defects at no additional cost to the Member and other NSRS Members as needed.

12. Software

The warranty for the Software is set forth in the Software License Agreement. The SERVICE PROVIDER shall update all devices to the same and latest release level prior to the conclusion of the Warranty Period at no additional cost to the NSRS Members.

13. THE WARRANTIES AND REMEDIES SET FORTH IN THIS SECTION AND IN THE SOFTWARE LICENSE AGREEMENT CONSTITUTE THE ONLY WARRANTIES WITH RESPECT TO THE HARDWARE, SOFTWARE AND SERVICES AND THE DEPARTMENT'S

EXCLUSIVE REMEDIES IN THE EVENT SUCH WARRANTIES ARE BREACHED. THEY ARE IN LIEU OF ALL OTHER WARRANTIES WHETHER WRITTEN, ORAL, EXPRESS, IMPLIED, OR STATUTORY INCLUDING, WITHOUT LIMITATION, THE WARRANTY OF MERCHANTABILITY AND THE WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL SERVICE PROVIDER BE LIABLE FOR SPECIAL, CONSEQUENTIAL OR INDIRECT DAMAGES INCLUDING, BUT NOT LIMITED TO, LOSS OF PROFITS OR REVENUES.

ARTICLE X- INTERFERENCE

1. Radio system coverage and performance are subject to degradation due to anomalous propagation and interference beyond the reasonable control of SERVICE PROVIDER. SERVICE PROVIDER cannot be responsible for degradation or disruption of Service caused by operation of other radio systems or by natural phenomena or other interference over which the SERVICE PROVIDER has no reasonable control. In the event of a case of degradation due to interference by an outside party, SERVICE PROVIDER will provide engineering support to the DEPARTMENT at the DEPARTMENT's expense to support the DEPARTMENT's efforts in resolving the interference issue with the outside party.

ARTICLE XI - PATENTS

1. SERVICE PROVIDER warrants that the System furnished hereunder shall be delivered free of any rightful claim of any third party for infringement of any United States patent or copyright. If the DEPARTMENT notifies SERVICE PROVIDER promptly of the receipt of any claim that the System infringes a United States patent or copyright and gives SERVICE PROVIDER information, assistance, and exclusive authority to settle and defend such claim, SERVICE PROVIDER at its own expense shall defend, or may settle, any suit or proceeding against the DEPARTMENT so far as based on a claimed infringement which breaches this warranty. If, in any such suit arising from such claim, the continued use of the System for the purpose intended is enjoined by any court of competent jurisdiction, SERVICE PROVIDER shall, at its expense and option, either: (1) procure for the DEPARTMENT the right to continue using the System, or (2) modify the System so that it becomes non-infringing, or (3) replace the System or portions thereof so that it becomes non-infringing, or (4) remove the System and refund the purchase price (less reasonable depreciation for use). The foregoing states the entire liability of SERVICE PROVIDER for patent or copyright infringement by the System and is subject to any limitation of total liability set forth in this Agreement.

2. The preceding Paragraph 1 of this Article XI shall not apply to: (1) any portion of the System which is manufactured to the DEPARTMENT's design, or (2) the use of the System in conjunction with any other apparatus or material not supplied by SERVICE PROVIDER to the extent that such conjoined use causes the alleged infringement. As to any portion of the System or use described in the preceding sentence, SERVICE PROVIDER assumes no liability whatsoever for patent infringement.

3. THE PATENT AND COPYRIGHT WARRANTY AND INDEMNITY OBLIGATIONS RECITED ABOVE ARE IN LIEU OF ALL OTHER PATENT AND COPYRIGHT WARRANTIES AND INDEMNITIES WHATSOEVER, WHETHER ORAL, WRITTEN, EXPRESS, IMPLIED OR STATUTORY.

ARTICLE XII – LIMITATION OF LIABILITY

1. Except for SERVICE PROVIDER's liability to third parties for its willful misconduct or negligent acts or omissions as more particularly described in Article XVII Miscellaneous Provisions, paragraph 24 of this Agreement, the total liability of SERVICE PROVIDER, including its subcontractors or suppliers, for all claims of any kind for any loss or damage, whether in

contract, warranty, tort (including negligence or infringement), strict liability or otherwise, arising out of, connected with, or resulting from the performance or non-performance of this Agreement or from the manufacture, sale, delivery, installation, technical direction of installation, resale, repair, replacement, licensing or use of any Hardware, Software or the furnishing of any Service, shall not exceed one hundred percent (100%) of the Total Agreement Price . Except as to title, any such liability shall terminate upon the expiration of the Warranty Period.

2. IN NO EVENT, WHETHER AS A RESULT OF BREACH OF AGREEMENT, WARRANTY, TORT (INCLUDING NEGLIGENCE OR INFRINGEMENT), STRICT LIABILITY OR OTHERWISE, SHALL SERVICE PROVIDER, OR ITS SUBCONTRACTORS OR SUPPLIERS, BE LIABLE FOR ANY SPECIAL, CONSEQUENTIAL, INCIDENTAL, INDIRECT OR EXEMPLARY DAMAGES, INCLUDING, BUT NOT LIMITED TO, LOSS OF PROFITS OR REVENUES, LOSS OF USE OF THE HARDWARE OR ANY OTHER EQUIPMENT, COST OF CAPITAL, COST OF SUBSTITUTE GOODS, FACILITIES, SERVICES OR DOWNTIME COSTS.

3. Any action for any claim of any kind for any loss or damages arising out of, connected with, or resulting from the performance, non-performance or breach of this Agreement, or from the manufacture, sale, delivery, installation, technical direction of installation, resale, repair, replacement, licensing or use of any Hardware, Software or the furnishing of any Services, shall be commenced within the statutory period pursuant to Nevada law, it shall be deemed waived or barred.

4. The provisions of this Section, Article XII Limitation of Liability, shall apply notwithstanding any other provisions of this Agreement or any other agreement.

5. The provisions of this Section, Article XII Limitation of Liability, shall survive the expiration or termination of this Agreement.

ARTICLE XIII – CONFIDENTIALITY

1. During the term of this Agreement, it is anticipated that one (1) party (hereafter the "Disclosing Party") may disclose to the other party (hereafter the "Receiving Party") information which the Disclosing Party considers proprietary and confidential. Accordingly, with respect to any specification, drawings, sketches, models, samples, tools, technical information, confidential business information or data, in written or other tangible form which: (1) has been designated in writing by the Disclosing Party as confidential or proprietary, or (2) is of the type that the Receiving Party customarily treats as confidential or proprietary, and which is furnished by the Disclosing Party to the Receiving party in contemplation of or under this Agreement (hereinafter "Information"), the Receiving Party shall treat such Information, for a period of five (5) years after the Effective Date of this Agreement, as confidential information with the same degree of care as the Receiving Party affords to confidential information of its own of a similar nature and shall not reproduce any such Information, in whole or in part, except as specifically authorized in writing by the Disclosing Party.

2. The provisions of Article XIII, paragraph 1 above, shall not apply to any Information which:

a. is or shall become publicly available without breach of this Section, Confidentiality, on the part of the Receiving Party;

b. is already known by the Receiving Party prior to receipt from the Disclosing Party;

c. is independently developed by the Receiving Party;

d. is rightfully obtained by the Receiving Party from third parties without restriction; or

e. is required to be disclosed by appropriate governmental or judicial order provided that Receiving Party gives Disclosing Party prior written notice of such order and assists Disclosing Party in taking reasonable actions to restrict such order.

3. The provisions of this Section, Confidentiality, shall survive the expiration or termination of this Agreement.

4. The confidentiality obligations of this Article XIII Confidentiality shall not apply to Software. Instead, the confidentiality and other rights and obligations with respect to Software are set forth in Attachment B Software License Agreement.

5. Pursuant to NRS 239.010, information or documents may be open to public inspection and copying. The DEPARTMENT will have the duty to disclose unless a particular record is confidential by law or a common law balancing of interests.

ARTICLE XIV - TERMINATION

1. The DEPARTMENT may terminate this Agreement without cause sixty (60) calendar days after service of a termination letter to the SERVICE PROVIDER. In the event this Agreement is terminated in this manner, all finished and unfinished Hardware and Documentation Deliverables produced or made by SERVICE PROVIDER for the DEPARTMENT under this Agreement shall become the property of the DEPARTMENT, and SERVICE PROVIDER shall be entitled to receive compensation in accordance with the terms of this Agreement for any such Hardware and Documentation Deliverables. Notwithstanding the above, SERVICE PROVIDER shall not be relieved of liability to the DEPARTMENT for damages sustained by the DEPARTMENT by virtue of any breach of this Agreement by SERVICE PROVIDER described above and, after providing SERVICE PROVIDER with written notice, the DEPARTMENT may withhold any payments to SERVICE PROVIDER for the purpose of set-off of any damages, as agreed upon or finally adjudicated, against such payment.

2. The continuation of this Agreement beyond the current biennium is subject to and contingent upon sufficient funds being appropriated, budgeted, and otherwise made available by the Nevada State Legislature and/or federal sources. The DEPARTMENT may terminate this Agreement, and the SERVICE PROVIDER waives any and all claims for damages, effective immediately upon receipt of written notice, or any date specified therein, if for any reason the DEPARTMENT's funding from state and/or federal sources is not appropriated or is withdrawn, limited or impaired.

3. A default or breach may be declared with or without termination. This Agreement may be terminated by either Party upon written notice of default or breach to the other Party as follows:

a. If the SERVICE PROVIDER fails to provide or perform any of the professional services called for by this Agreement within the time requirements specified in this Agreement or within any granted extension of those time requirements; or

b. If any state, county, city, or federal license, authorization, waiver, permit, qualification, or certification required by statute, ordinance, law, or regulation to be held by the SERVICE PROVIDER to provide the goods or services required by this Agreement is for any reason denied, revoked, debarred, excluded, terminated, suspended, lapsed, or not renewed; or

c. If the SERVICE PROVIDER becomes insolvent, subject to receivership, or becomes voluntarily or involuntarily subject to the jurisdiction of a bankruptcy court; or

d. If DEPARTMENT materially breaches any material duty under this

Agreement and any such breach impairs the SERVICE PROVIDER's ability to perform; or

e. If it is found by the DEPARTMENT that any quid pro quo or gratuities in the form of money, services, entertainment, gifts, or otherwise were offered or given by the SERVICE PROVIDER, or any agent or representative of the SERVICE PROVIDER, to any officer or employee of the State of Nevada with a view toward securing an agreement or securing favorable treatment with respect to awarding, extending, amending, or making any determination with respect to the performing of such agreement; or

f. If the SERVICE PROVIDER knowingly bills the DEPARTMENT for unallowable costs or non bona fide goods or services, or for goods and services not provided.

4. Termination upon a declared default or breach may be exercised after service of written notice and the subsequent failure of the defaulting Party, within thirty (30) calendar days of service of that notice, to provide evidence, satisfactory to the aggrieved Party, showing the declared default or breach has been corrected. Such correspondence shall be deemed to have been served on the date of postmark.

5. In the event of the SERVICE PROVIDER's breach of this Agreement, all costs and charges incurred by the DEPARTMENT, together with the cost of completing the work under this Agreement, shall be deducted from any money due or which may become due to said SERVICE PROVIDER. If expenses exceed the sum which would have been payable under this Agreement, then the SERVICE PROVIDER shall be liable and shall pay to the DEPARTMENT the amount of said excess.

6. In the event of: (1) any failure by the DEPARTMENT for sixty (60) or more calendar days to make any payment when due, or (2) any other material breach of this Agreement by the DEPARTMENT which shall continue for one hundred twenty (120) or more calendar days after written notice of such breach (including a reasonably detailed statement of the nature of such breach) shall have been given to the DEPARTMENT by SERVICE PROVIDER, SERVICE PROVIDER shall be entitled to avail itself cumulatively of any and all remedies available at law or in equity (provided such remedies are not otherwise limited under the terms of this Agreement) and either: (1) suspend performance of its obligations under this Agreement for as long as the breach remains uncorrected; or (2) terminate this Agreement by written notice to the DEPARTMENT if the breach remains uncorrected.

7. In the event the DEPARTMENT terminates this Agreement as provided herein, all finished and unfinished Hardware and Documentation Deliverables produced or made by SERVICE PROVIDER for the DEPARTMENT under this Agreement shall become the property of the DEPARTMENT and SERVICE PROVIDER shall be entitled to receive compensation in accordance with the terms of this Agreement for any such Hardware and Documentation Deliverables. Notwithstanding the above, SERVICE PROVIDER shall not be relieved of liability to the DEPARTMENT for damages sustained by the DEPARTMENT by virtue of any breach of this Agreement by SERVICE PROVIDER described above and, after providing SERVICE PROVIDER with written notice, the DEPARTMENT may withhold any payments to SERVICE PROVIDER for the purpose of set-off of any damages, as agreed upon or finally adjudicated, against such payment.

ARTICLE XV - COST

1. "The lump sum" method of compensation shall be used for the SERVICE PROVIDER's services.

2. The Total Agreement Price to be paid by the DEPARTMENT to SERVICE PROVIDER under the terms of this Agreement is Fifty Million Six Hundred Five Thousand Six Hundred Sixty-Nine

and 13/100 Dollars. ($50,605,669.13). The individual prices for the units of Hardware, the Software license, and the Services to be performed by SERVICE PROVIDER are those as set forth in Exhibit 6 Price Schedule. DEPARTMENT and SERVICE PROVIDER recognize that the pricing under this Agreement is dependent upon a volume discount based on the amount of Terminal and Infrastructure Hardware, including radios, purchased by DEPARTMENT. The SERVICE PROVIDER will offer the same discounted pricing to the DEPARTMENT, any additional Nevada public agencies, and users of the NSRS through the Extended Warranty period if the quantity of radios specified in the Equipment List is met. DEPARTMENT can change the Terminal Hardware types, models, and feature sets through the Change Order process to meet the forecast quantities under this Agreement. The Parties recognize that the dollar amount of SERVICE PROVIDER's price discount is largely driven by the number of radios DEPARTMENT has forecast that it will purchase under this Agreement.

In the event that the DEPARTMENT does not purchase the total number of radios under this Agreement that are represented in Exhibit 5 Equipment List and Exhibit 6 Price Schedule, DEPARTMENT agrees that SERVICE PROVIDER shall be entitled to an equitable adjustment to its discounted pricing by Change Order to appropriately adjust the Total Agreement Price. However, if the DEPARTMENT purchases other Terminal and Infrastructure Hardware in addition to the quantities specified in Exhibits 5 and 6 of this Agreement, then the value of such additional equipment purchased will offset an equal value of a number of radios not purchased. That offset number of radios not purchased shall be added to the total number of radios purchased for the purposes of determining the DEPARTMENT's entitlement to a discounted price. In other words, the value of other Terminal and Infrastructure Hardware purchased beyond the value of such equipment listed in Exhibits 5 and 6 will be credited to DEPARTMENT as a means of making up for an equal value of radios not purchased by DEPARTMENT for the purposes of SERVICE PROVIDER's determination of a discounted price. As a result of SERVICE PROVIDER's accommodation, DEPARTMENT may be entitled to the same discounted price even though the number of radios purchased is less than the amount of radios forecast to be purchased in Exhibits 5 and 6. SERVICE PROVIDER agrees to such accommodation to DEPARTMENT in exchange for DEPARTMENT's purchases of Terminal and Infrastructure Hardware beyond the quantities set forth in Exhibits 5 and 6.

Additionally, the Total Agreement Price is based on the Parties' acknowledgement that State funding and requirements are to be used for this PROJECT. In the event the DEPARTMENT elects to incorporate Federal funding into this PROJECT in the future, the Parties will negotiate an amendment to this Agreement to incorporate the additional costs that SERVICE PROVIDER may incur as a result of any additional Federal requirements placed upon SERVICE PROVIDER.

SERVICE PROVIDER will offer the same discounting offered on radios on the contract for a new HIGH TIER radio that becomes available in the timeframe of the agreement to the DEPARTMENT. A high tier radio includes Harris XL, XG, etc. This will exclude Harris low tier. Any low tier radio can receive a max fifty percent (50%) off list discount.

Terminal Hardware Pricing after extended warranty identified below:

Terminal Hardware Pricing Discount Post Warranty	
• Discount per PO Quantity	
Tier Quantity	**Discount off List**
4,000+	70%
3,000-3,999	65%
2,000-2,999	60%
1,000-1,999	55%
1-999	48%

3. **Service Provider Radio System Equipment**

The mutually agreed upon SERVICE PROVIDER radio system equipment pricing amounts have been priced on a commercial, firm-fixed price basis and are set forth in the table below and in the Total NSRS Price Summary, Table B.1 in Exhibit 6 to the Scope of Services. The total amount of the following categories of Service Provider radio system equipment listed in the table below Nine Million Nine Thousand Three Hundred Seventy-Six and 46/100 Dollars ($9,009,376.46) will be billed in accordance with the contract milestone payments listed in ARTICLE XVI, paragraph 4. The pricing amounts do not include any sales and use taxes. Applicable sales and use taxes, if any, will be included on invoices and payable by DEPARTMENT.

Service Provider Radio System Equipment Pricing Amounts	
System Control Equipment, Software, and Licensing	$2,625,307.62
Network Monitoring and Fault Management Equipment, Software, and Licensing	979,020.00
Radio System Equipment, Software, and Licensing	13,848,871.71
Antenna Systems	1,775,692.88
Networking Equipment, Software, and Licensing	1,185,603.21
Spare Equipment	1,418,674.44
Dispatch Equipment	1,451,723.25
Extended Warranty Support	2,144,642.00
DEPARTMENT Greenfield Sites Radio System Equipment (Table B.11 without Civils)	2,988,389.54
Less Additional Discount – Infrastructure	(19,408,548.17)
Total	$9,009,376.46

4. **SERVICE PROVIDER Radio System Deployment Services and SERVICE PROVIDER Training**

The mutually agreed upon total amounts for System Engineering Services and Program Management Services have been priced on a commercial, firm-fixed price basis and are set forth in the table below and in Table B.1, Total NSRS Price Summary, in Exhibit 6 to the Scope of Services. System Engineering Services and Program Management Services will be paid monthly as follows. Invoices will be submitted monthly together with monthly summary time reports. The monthly summary time reports will show the total number of hours worked in the month on the DEPARTMENT project by the applicable categories of SERVICE PROVIDER engineers, program managers, and technicians. The total number of hours worked by each category of SERVICE PROVIDER engineers, program managers, and technicians in the month will then be multiplied by the hourly rate for the applicable category of services using the Harris Price Catalog rates set forth in the table below. No additional documentation will be required for payment of monthly invoices. The cumulative total amount of System Engineering Services and Program Management Services billed by SERVICE PROVIDER shall not exceed the total amount of System Engineering Services and Project Management Services shown in the table below.

SERVICE PROVIDER Radio System Deployment Services and System Training Pricing Amounts	
System Engineering Services	$4,025,524.00
Program Management Services	1,325,100.00

System Training	464,555.85
Total	$5,815,179.85

Description	List Price (Hourly Rate-Fully Burdened)
SERVICE, RF INTEGRITY Hourly rate for Engineering services to predict RF coverage from designated transmission site.	$ 151.25
SERVICE, HARRIS SYSTEM ENGINEERING Hourly rate for System Engineering Services.	$ 198.75
SERVICE, HARRIS SENIOR SYSTEM ENGINEERING Hourly rate for Senior System Engineering Services	$ 300.00
SERVICE, HARRIS PROJECT MANAGEMENT Hourly rate for Project Management to assist implementing customer projects.	$ 198.75
SERVICE, HARRIS SENIOR PROJECT MANAGEMENT Hourly rate for Senior Project Management to assist implementing customer projects.	$ 300.00
SERVICE, DATA SYSTEM ENGINEER Hourly rate for Data System Engineer	$ 187.50
SERVICE, SENIOR SYSTEM TECHNICIAN, Hourly Rate for Senior Technicians to perform installation, testing, system alignment or evaluate special applications. Travel and living will be billed inaddition to this fee	$ 150.00
SERVICE, SYSTEM TECHNICIAN, Hourly rate for Technicians to perform installation, testing, system alignment or evaluate special applications. Travel and living will be billed inaddition to this fee	$ 125.00

Training will be invoiced upon its completion by DEPARTMENT participants of training classes at the applicable class price listed in the pricing pages in Exhibit 6 to the Scope of Services. Invoice documentation will include the participant names, classes taken, and class prices.

5. **Subcontract (Third Party) Materials and Services Amounts**

System Equipment Installation Services	$ 4,103,765.00
Site Infrastructure Civils (Base Proposal and Greenfield Sites) (Estimate)	$ 15,866,655.00
Site Development Services (Base Proposal and Greenfield Sites)	$ 2,269,882.00

a) System Equipment Installation Services includes, without limitation, services costs for installation of radio equipment, antenna systems, and removal of old equipment as further discussed in the Statement of Work.

b) Site Infrastructure Civils (Base Proposal and Greenfield Sites) includes, without limitation, materials and services costs for manufacture and installation of radio towers and equipment shelters together with performance of associated site work, including providing

roads, fencing, land clearing, generators and LP tanks, electrical work, DC power systems, and assistance with site acquisition, permits, and drawings, all as further discussed in the Statement of Work.

c) Site Development Services (Base Proposal and Greenfield Sites) includes, without limitation, services to be performed by third party Site Managers and performance of site surveys, as further discussed in the Statement of Work.

6. Due to the scope and nature of this Agreement, contingency funds have been established to address unforeseen SERVICE PROVIDER services that may be required to complete the PROJECT in a timely manner. The scope of services requiring the use of contingency funds will be agreed upon in writing by the Parties to this Agreement prior to the commencement of such services. The cost of contingency services will also be negotiated prior to performing the services and will include all costs associated with the work. The total costs of the work for the contingency funds for this Agreement shall not exceed the sum of Five Million Sixty Thousand Five Hundred Sixty-Six and No/100 Dollars ($5,060,566.00) unless such sum is increased through a written amendment to this Agreement. Contingency services to be performed by the SERVICE PROVIDER shall not commence until its receipt of written approval from the DEPARTMENT. The DEPARTMENT Encumbered Contract Value is the sum of the Total Agreement Price at execution of this Agreement (or as modified by subsequent Change Order) plus the contingency amount, unless increased by a written amendment and signed by all Parties.

7. The total DEPARTMENT Encumbered Contract Value, which includes the contingency, shall not exceed Fifty-Five Million Six Hundred Sixty-Six Thousand Two Hundred Thirty-Five and 13/100 Dollars ($55,666,235.13), unless approved by all Parties through a written Amendment.

8. The SERVICE PROVIDER shall pay all associated travel costs for three (3) DEPARTMENT employees to and from the factory staging location in Lynchburg, VA. The SERVICE PROVIDER shall also pay all associated travel costs for two (2) DEPARTMENT employees to and from the Harris User Group once a year for the duration of this Agreement. Travel costs will be paid at the accepted GSA rates.

9. No additional costs shall be allowed to the SERVICE PROVIDER for assistance by, or services of others, except by express permission in writing by the DEPARTMENT. The SERVICE PROVIDER shall furnish the DEPARTMENT, on the form provided, no later than thirty (30) calendar days prior to commencement of work, performance and payment bonds in an amount equal to the firm-fixed price cost of this Agreement. The performance and payment bonds shall terminate upon Final System Acceptance in accordance with Article VI, paragraph 5.

ARTICLE XVI - SCHEDULE OF PAYMENTS

1. The SERVICE PROVIDER shall submit a signed invoice in accordance with the approved Exhibit 6 Price Schedule for all services rendered along with one (1) copy of substantiating documentation. The invoice must be submitted on the SERVICE PROVIDER's stationery using the DEPARTMENT's format or submitted on the DEPARTMENT's standard invoice form. The DEPARTMENT will utilize its normal accounting procedure in the payment of the invoices submitted. All invoice payment(s) shall be due sixty (60) calendar days following the submittal date of the SERVICE PROVIDER invoice.

2. Payment will be made for one hundred percent (100%) of the amount of each invoice, until a maximum of ninety percent (90%) of the total Agreement costs have been billed by the SERVICE PROVIDER. Thereafter, payment for the remaining ten percent (10%) of the total Agreement costs shall be withheld by the DEPARTMENT, until such time as the professional

services delivered by the SERVICE PROVIDER have been completely accepted by the DEPARTMENT. The final audit shall be performed after the release of the retained amount, and may cause an adjustment of payments to the DEPARTMENT or to the SERVICE PROVIDER. No interest shall be paid to the SERVICE PROVIDER on this retained amount or any adjustment of payments.

3. The DEPARTMENT reserves the right to inspect and approve the professional services performed before payment is made to the SERVICE PROVIDER. Payment will be withheld for deliverables and professional services the DEPARTMENT determines to be unsatisfactory in that they have not been provided in a workmanlike manner consistent with standards in the trade, profession, or industry. Payment shall remain unpaid until the professional services are completed in accordance with the standards and work requirements defined in this Agreement. In such an event, the DEPARTMENT will provide the SERVICE PROVIDER with a written explanation as to why a payment has been withheld.

4. **SERVICE PROVIDER Radio System Equipment Milestone Payments**

Milestone Payment	%	Milestone Payment Amount
1. Contract Mobilization due at Contract Signing & ISC Approval	15%	$ 1,351,406.47
2. Customer Approval of Detailed Design Review – Region 1	5%	$ 450,468.82
3. Customer Approval of Detailed Design Review – Region 2	5%	$ 450,468.82
4. Customer Approval of Detailed Design Review – Region 3	5%	$ 450,468.82
5. Completion of Equipment Staging for Region 1	2%	$ 180,187.53
6. Completion of Equipment Staging for Region 2	1%	$ 90,093.75
7. Completion of Equipment Staging for Region 3	2%	$ 180,187.53
8. Equipment Delivery for Region 1	8%	$ 720,750.12
9. Equipment Delivery for Region 2	4%	$ 360,375.06
10. Equipment Delivery for Region 3	8%	$ 720,750.12
11. Completion of Equipment Installation - Region 1	10%	$ 900,937.65
12. Completion of Equipment Installation - Region 2	6%	$ 540,562.59
13. Completion of Equipment Installation - Region 3	10%	$ 900,937.65
14. Final System Acceptance - Region 1	6%	$ 540,562.59
15. Final System Acceptance - Region 2	3%	$ 270, 281.29
16. Final System Acceptance - Region 3	10%	$ 900,937.65
Service Provider Radio System Equipment Billing Total	**100%**	**$ 9,009,376.46**

Terminal Hardware Payments:

DEPARTMENT Subscriber Equipment (Terminals) and Services amounts will be invoiced upon shipment of the Terminal units on a per unit basis at the unit prices set forth in the pricing pages less the Radio Volume Discount percentage listed in Table B.1, Price Summary**.** Shipment schedule will be determined by customer.

Payment Notes for Service Provider Radio System Equipment Milestone Payments

A. Equipment Delivery Partial Payments – Partial billings are permitted for Equipment Delivery in amounts determined by multiplying: (1) a fraction equal to the price of the equipment delivered divided by the total price of the equipment to be delivered for the applicable Region; by (2) the Equipment Delivery Milestone Payment Amount for the applicable Region set forth in Lines 8, 9 and 10 in the above Milestone Payments Table.

B. Completion of Equipment Installation Partial Payments – Partial billings are permitted for Completion of Equipment Installation in amounts determined by multiplying: (1) a fraction equal to the number of sites in the applicable Region where Completion of Equipment Installation has occurred divided by the total number of sites in the applicable Region; by (2) the Completion of Equipment Installation Milestone Payment Amount for the applicable Region set forth in Lines 11, 12 and 13 in the above Milestone Payments Table.

5. **Subcontract (Third Party) Materials and Services**

a) System Equipment Installation Services, Site Infrastructure Civils (Base Proposal and Greenfield Sites) and Site Development Services (Base Proposal and Greenfield Sites) include materials and services to be provided by third party subcontractors in accordance with the terms and provisions of subcontracts approved by DEPARTMENT. The mutually agreed upon total amounts for System Equipment Installation Services, Site Infrastructure Civils (Base Proposal and Greenfield Sites) and Site Development Services (Base Proposal and Greenfield Sites) have been priced on a variable basis based on expenditures and agreed markup and are set forth in the table below and in Table B.1, Total NSRS Price Summary, in Exhibit 6 to the Scope of Services. The Site Infrastructure Civils (Base Proposal and Greenfield Sites) amount is an estimated amount only and will be revised as mutually agreed upon as the work to be performed is further defined and mutually agreed upon.

b) System Equipment Installation Services, Site Infrastructure Civils (Base Proposal and Greenfield Sites) and Site Development Services (Base Proposal and Greenfield Sites) will be paid monthly as follows: Invoices will be submitted by SERVICE PROVIDER monthly together with copies of the invoices received by SERVICE PROVIDER from the subcontractors providing the System Equipment Installation Services, Site Infrastructure Civils (Base Proposal and Greenfield Sites) and Site Development Services (Base Proposal and Greenfield Sites) materials and services. No additional documentation will be required for payment of monthly invoices. The SERVICE PROVIDER invoice amounts will be equal to the total of the attached subcontractor invoice amounts plus a markup percentage amount of twenty-five percent (25%) of the total of the attached subcontractor invoice amounts for material and thirty-two (32%) of the total of the attached subcontractor invoice amounts for services.

c) For invoices submitted for Site Infrastructure Civils (Base Proposal and Greenfield Sites), ten percent (10%) or less of each invoice payment amount for Site Infrastructure Civils (Base Proposal and Greenfield Sites), may be withheld, administered and returned by DEPARTMENT in accordance with all of the terms and provisions set forth in DEPARTMENT policy, provided, however, that all of the amounts retained for Site Infrastructure Civils (Base Proposal and Greenfield Sites) work performed in an applicable Region shall be paid to SERVICE PROVIDER on or before the date when the Final System Acceptance milestone payment for an applicable Region is paid to SERVICE PROVIDER under the SERVICE PROVIDER Radio System Equipment Milestone Payment Schedule.

d) **The definition of "third party materials" in this Agreement does not include any vendor materials listed in the Harris Price Catalog pages ("Vendor**

Materials"). Any Vendor Materials sold by SERVICE PROVIDER to DEPARTMENT which are not otherwise listed with a unit price in the pricing schedule pages in the Service Agreement, will be sold at the price listed in the Harris Price Catalog less a twenty-six percent (26%) discount. SERVICE PROVIDER will provide a copy of the applicable Harris Price Catalog page as substantiation for the price of any Vendor Materials.

6. Unless otherwise agreed by the parties, SERVICE PROVIDER's shall electronically submit invoices using the DEPARTMENT's cover page over the SERVICE PROVIDER's standard invoice template. DEPARTMENT shall pay all invoices via Electronic Funds Transfer ("EFT") directly to SERVICE PROVIDER's banking institution using SERVICE PROVIDER's banking information and EFT instructions below.

Harris Corporation
Bank of America, New York, NY 10038
Account No.: 4451124230
Routing/ABA (ACH ONLY): 111000012
Routing/ABA (Wire ONLY): 026009593

7. Payment of invoices, interest penalties, and discounts shall be paid as follows:

a. The SERVICE PROVIDER shall be paid within sixty (60) calendar days of submission of an invoice which is complete, correct, and undisputed by the DEPARTMENT.

b. The DEPARTMENT shall have fifteen (15) calendar days after submission of an invoice to dispute any or all of the charges on that invoice. The undisputed amount shall be paid to the SERVICE PROVIDER within sixty (60) calendar days of the date of submission. The disputed amount shall be negotiated and resolved in good faith by both Parties within fifteen (15) calendar days and paid within thirty (30) calendar days after the date the corrected invoice is received by the DEPARTMENT or is approved by both Parties for payment.

c. If the DEPARTMENT fails to pay the SERVICE PROVIDER the undisputed amount within sixty (60) calendar days after the submission date of the invoice, the interest penalty assessed to the DEPARTMENT shall be one percent (1%) of the undisputed amount per month, not to exceed a total of One Thousand and No/100 Dollars ($1,000.00) per month per invoice.

d. Payment of penalties shall not apply to the final payment or bill pertaining to this Agreement as determined by the post audit.

ARTICLE XVII - MISCELLANEOUS PROVISIONS

1. The SERVICE PROVIDER shall be responsible for and shall comply with all applicable federal, state, and local government obligations and DEPARTMENT policies and procedures. The SERVICE PROVIDER will be responsible for and shall pay all taxes, assessments, fees, premiums, permits, and licenses required by law. Real property and personal property taxes are SERVICE PROVIDER's responsibility in accordance with NRS Chapter 361. The SERVICE PROVIDER warrants that it has a valid business license. The SERVICE PROVIDER agrees to be responsible for and shall pay any such government obligations not paid by its subcontractors during performance of this Agreement. The DEPARTMENT may set-off any consideration due against any delinquent government obligation.

2. It is expressly understood that the SERVICE PROVIDER is an independent contractor, and is subject to all statutes and laws, including NRS 333.700 relating to independent contractors. Nothing contained in this Agreement shall be deemed or construed to create a

partnership or joint venture, to create relationships of an employer-employee or principal-agent, or to otherwise create any liability for the DEPARTMENT whatsoever with respect to the indebtedness, liabilities, and obligations of the SERVICE PROVIDER or any other party. Neither the SERVICE PROVIDER nor its employees, agents or representatives shall be considered employees, agents or representatives of the DEPARTMENT.

3. The SERVICE PROVIDER shall be solely responsible for its own employees, and the DEPARTMENT shall have no obligation with respect to:

a. Withholding of income taxes, FICA, or any other taxes or fees;

b. Industrial insurance coverage;

c. Participation in any group insurance plans available to employees of the DEPARTMENT;

d. Participation or contributions by either the SERVICE PROVIDER or the DEPARTMENT to the Public Employees Retirement System;

e. Accumulation of vacation leave or sick leave; or

f. Unemployment compensation coverage provided by the DEPARTMENT.

4. The SERVICE PROVIDER shall indemnify and hold the DEPARTMENT harmless from, and defend the DEPARTMENT against, any and all losses, damages, claims, costs, penalties, liabilities, and expenses arising or incurred because of, incident to, or otherwise with respect to any such taxes, fees, insurance, contributions, leave, or coverage.

5. Unless expressly provided in this Agreement, the SERVICE PROVIDER shall not engage or use the devices and/or services of the DEPARTMENT's personnel without the prior written consent of the DEPARTMENT.

6. The SERVICE PROVIDER shall furnish the DEPARTMENT, on the form provided, prior to commencement of work, the performance and payment bonds in the amount equal to the cost of this Agreement.

7. The SERVICE PROVIDER shall, before commencing professional services under the provisions of this Agreement, furnish to the DEPARTMENT proof of worker’s compensation insurance as required by the NRS.

8. The SERVICE PROVIDER shall furnish a Certificate of Errors and Omissions Insurance with a minimum limit of Three Million and No/100 Dollars ($3,000,000.00).

9. The SERVICE PROVIDER shall furnish a Certificate, a Declarations Page, and an Endorsement designating the DEPARTMENT as an additional insured evidencing Commercial General Liability Insurance with a limit of One Million and No/100 Dollars ($1,000,000.00) per occurrence. These policies shall be maintained for the entire period of this Agreement. The policies shall include a thirty (30) calendar day advance written notice of any cancellation of said policies. The SERVICE PROVIDER shall furnish the DEPARTMENT with certificates of such insurance prior to commencement of professional services.

10. All insurance required by this Agreement shall be placed with insurers with a rating from the current issue of Best’s Key Rating Guide of no less than A-: VII.

11. The DEPARTMENT has the option of requesting, at any time, a meeting with the SERVICE PROVIDER or its authorized representative to discuss and review PROJECT status and the SERVICE PROVIDER shall furnish thereafter a copy of the minutes of such meetings to the DEPARTMENT.

12. The SERVICE PROVIDER has total responsibility for the accuracy and correctness of data prepared under the terms of this Agreement, and shall check all such material accordingly for completeness, missing items, correct multipliers, and consistency. The deliverables shall be reviewed by the DEPARTMENT for conformity with the DEPARTMENT's procedures and contract terms.

13. The SERVICE PROVIDER shall appear as a consultant and if necessary as an expert witness on behalf of the DEPARTMENT in any subsequent court action which involves any of the services required by this Agreement. Compensation for services rendered in this regard will be paid at a rate to be negotiated at the time such services are necessary.

14. Upon completion, termination or cancellation of the services embraced under this Agreement, all professional services inclusive of research, investigation, and analysis data, reports (including files stored on mobile media), computations, tabulations, original drawings, and design files (including CAD information stored on mobile media), correspondence input from external sources (including subcontractors), etc., shall be delivered to and become the property of the DEPARTMENT, without limitation. Reuse of said materials, information or data, during performance or following termination of this Agreement, on any other project or for any other purpose except as provided for herein, shall be at the DEPARTMENT's discretion and the DEPARTMENT's sole decision. The SERVICE PROVIDER shall not utilize any materials, information, or data obtained as a result of performing the services called for in this Agreement in any commercial or academic publication or presentation without the express written permission of the DEPARTMENT. The SERVICE PROVIDER shall not reference an opinion of an employee or agent of the DEPARTMENT obtained as a result of performing the services called for in this Agreement, in any publication or presentation, without the written permission of the employee or agent to whom the opinion is attributed, in addition to the written permission of the DEPARTMENT.

15. All design drawings must be created and delivered to the DEPARTMENT in Vision ".vsdx" format. Drawing files converted to Visio ".vsdx" format from other formats will not be accepted by the DEPARTMENT. Files must be delivered to the DEPARTMENT via USB flash drive, FTP, or email. All files must adhere to the DEPARTMENT's standards.

16. All reports and notes for special provisions shall be delivered to the DEPARTMENT via USB flash drive, FTP, or email using the most current version of Microsoft Word.

17. The SERVICE PROVIDER agrees that any reports, materials, studies, photographs, negatives, drawings, or other documents prepared by the SERVICE PROVIDER in the performance of its obligations under this Agreement shall be the exclusive property of the DEPARTMENT. The SERVICE PROVIDER shall remit all such documents to the DEPARTMENT upon completion, termination, or cancellation of this Agreement or upon written request of the DEPARTMENT. The SERVICE PROVIDER shall not use, willingly allow, or cause to have such documents used for any purpose other than performance of the SERVICE PROVIDER's obligation under this Agreement, without the prior written consent of the DEPARTMENT.

18. The SERVICE PROVIDER and successors, executors, administrators, and assigns of the SERVICE PROVIDER's interest in the professional services or the compensation herein provided shall be bound to the DEPARTMENT to the full legal extent to which the SERVICE PROVIDER is bound with respect to each of the terms of this Agreement.

19. The SERVICE PROVIDER warrants that it has not employed or retained any company or persons (other than a bona fide employee working solely for the SERVICE PROVIDER) to solicit or secure this Agreement and that the SERVICE PROVIDER has not paid or agreed to pay any company or persons (other than a bona fide employee working solely for the SERVICE PROVIDER) any fee, commission, percentage, brokerage fee, or any other gifts contingent upon or resulting from the award or making of this Agreement. For breach or violation of this warranty, the DEPARTMENT shall have the right to annul this Agreement without liability, or, in its discretion, to deduct from the Agreement price or consideration, or otherwise recover, the full amount of such fee, commission, percentage, brokerage fee, gift, or contingent fee.

20. Dispute Resolution Procedures:

a. Issue Resolution Ladder: The Issue Resolution Ladder is the process for elevating Disputes from the PROJECT's field level to various levels of review, up to the Parties' executive management if necessary, with defined time limits for each level of review. The goal of the Issue Resolution Ladder is to resolve each Dispute as close to the field level as possible while recognizing the requirement to elevate the Dispute to the next level of review before the Dispute impacts cost or schedule. The Issue Resolution Ladder shall consist of four (4) levels of review and corresponding time limits to review, as follows:

Level of Review	SERVICE PROVIDER Reviewer	DEPARTMENT Reviewer	Time Limit
4	Executive Board	DEPARTMENT Director's Office	2 weeks
3	Regional Manager	Chief of Project Management / District Engineer	2 weeks
2	Project Manager	Project Manager	1 week
1	Technical Lead	Technical Lead	3 days

The individuals from the DEPARTMENT's and SERVICE PROVIDER's respective organizations filling the roles of reviewers in the Issue Resolution Ladder, and the documentation required for each level of review in the Issue Resolution Ladder shall be identified by the respective team members. If reviewers at any level of the Issue Resolution Ladder cannot resolve a Dispute within the time limits set forth, the reviewers shall elevate the Dispute to the next level of review. If all four (4) levels of review have been exhausted, then Section B. below shall apply.

b. For purposes of Outcome of Issue Resolution Ladder:

1. If the DEPARTMENT and SERVICE PROVIDER succeed in resolving an issue using the Issue Resolution Ladder, the Parties shall memorialize the resolution in writing, including execution of any Change Order as appropriate and promptly perform their respective obligations in accordance therewith.

2. If a Dispute is not timely resolved using the Issue Resolution Ladder, then the Parties agree to submit the dispute to non-binding mediation using a single mediator mutually agreed upon by the Parties and following the Commercial Mediation Rules of the American Arbitration Association ("AAA"). As to the appointment of the mediator, and in accordance with the AAA, section M-4 Appointment of the Mediator, the Parties shall mutually agree to appoint an impartial mediator residing in Nevada or familiar with Nevada law and appoint such mediator for any dispute submitted to the American Arbitration Association for mediation or conciliation. If the dispute is unable to be resolved through good faith negotiations and non-binding mediation, then the Parties may pursue all of their legal and equitable remedies.

c. State court Litigation Only if the Parties are unable to settle a Dispute following Section B. above, then either Party may thereafter file a lawsuit in the Nevada First Judicial District Court located in Carson City, Nevada. Said lawsuit shall be filed no later than one hundred eighty (180) calendar days following issuance mediation finding. Service of the complaint shall be as prescribed by law, and all Parties agree to waive jury trial and rely on an objective procedure before a judge experienced in matters of commercial law.

d. Continuation of Work and Payments:

1. At all times during Dispute Resolution Procedures, SERVICE PROVIDER and all SERVICE PROVIDER -Related Entities shall continue with the performance of the Work and their obligations, including any undisputed Work or obligations, diligently and without delay, in accordance with this Agreement, except to the extent enjoined by order of a court or otherwise approved by the DEPARTMENT in its sole discretion. SERVICE PROVIDER acknowledges that it shall be solely responsible for the results of any delaying actions or inactions taken during the course of Dispute Resolution Procedures relating to the disputed Work even if SERVICE PROVIDER's position in connection with the Dispute ultimately prevails.

2. During the course of any Dispute Resolution Procedures, the Parties shall continue to comply with all provisions of this Agreement, the Project Management Plan, the Governmental Approvals, and applicable Governmental Rules.

3. During the course of any Dispute Resolution Procedures, the DEPARTMENT shall continue to pay to SERVICE PROVIDER, when due, all undisputed amounts owing under this Agreement.

e. Joinder: SERVICE PROVIDER agrees that, (a) at the DEPARTMENT's request, SERVICE PROVIDER shall take appropriate action to join third parties and Subcontractors involved in the design or construction of any part of the PROJECT as parties in dispute resolution proceedings under this Article XVII, Paragraph 20, and (b) SERVICE PROVIDER will allow itself to be joined as a participant in any dispute, arbitration or other proceeding that involves the DEPARTMENT and any other Person relating to the PROJECT. This provision is for the benefit of the DEPARTMENT and not for the benefit of any other party.

f. SERVICE PROVIDER Effect on Surety: Any decisions made in accordance with this Article XVII that are binding on SERVICE PROVIDER shall also be binding on the Surety under the Performance Bond; provided, however that unless the Surety is a party to such proceedings, such decisions shall not affect any defenses which are special to the Surety (i.e., defenses available to the Surety which could not have been asserted by SERVICE PROVIDER in the underlying proceeding). In the event that the Surety is a party to any proceedings, it shall have the right to, and must, assert any such special defenses therein.

g. Emergency Dispute Resolution: If a Dispute arises which must be resolved expeditiously to prevent serious damage to person or property, or serious interference with a Critical Path, both Parties shall make every effort to resolve such Dispute quickly. In such case, if SERVICE PROVIDER's Project Manager and the DEPARTMENT's Project Manager cannot reach a resolution of that Dispute within twenty-four (24) hours, they must refer the Dispute to the DEPARTMENT's Director and SERVICE PROVIDER's Chief Executive Officer (or other officer with authority to make final decisions subject only to board approval and any required third party approvals) for a meeting between the DEPARTMENT's Director and SERVICE PROVIDER's Chief Executive Officer to occur within the following twenty-four (24) hours. Once the urgent aspects of the Dispute have been resolved, the Parties may continue with the remaining procedures for dispute resolution if necessary and to the extent applicable.

h. Time Limitation: SERVICE PROVIDER acknowledges and agrees that the

DEPARTMENT is subject to substantial constraints which have resulted in limitations on its ability to increase the Total Agreement Price or extend a Completion Deadline. SERVICE PROVIDER acknowledges and agrees that, due to limitations on funding for the PROJECT, prompt resolution of Disputes is of vital importance to the DEPARTMENT. SERVICE PROVIDER agrees that the time limitations stated in this Agreement for the filing of Claims and/or complaints with the Disputes Review Team and any subsequent State court litigation pursuant to this Article XVII are necessary and reasonable.

21. During the performance of this Agreement, the SERVICE PROVIDER, for itself, its assignees and successors in interest agrees as follows:

a. Compliance with Regulations: The SERVICE PROVIDER shall comply with all of the regulations relative to nondiscrimination in federally-assisted programs of 49 CFR Part 21 as they may be amended from time to time (hereinafter “Regulations”), which are herein incorporated by reference and made a part of this Agreement.

b. Nondiscrimination: The SERVICE PROVIDER, with regard to the professional services performed by it during the Agreement, shall not discriminate on the grounds of race, color, age, religion, sex, creed, handicap, or national origin in the selection and retention of subcontractors, including procurement of materials and leases of equipment. The SERVICE PROVIDER shall not participate either directly or indirectly in the discrimination prohibited by Section 21.5. of the Regulations, including employment practices, when the Agreement covers a program set forth in Appendix B of the Regulations.

c. Solicitations for Subcontracts, Including Procurement of Materials, and Equipment: In all solicitations either by competitive bidding or negotiation made by the SERVICE PROVIDER for professional services to be performed under a subcontract, including procurement of materials or leases of equipment, each potential subcontractor or supplier shall be notified by the SERVICE PROVIDER of the SERVICE PROVIDER's obligations under this Agreement and the Regulations relative to nondiscrimination on the grounds of race, color, age, religion, sex, creed, handicap, or national origin.

d. Information and Reports: The SERVICE PROVIDER shall provide all information and reports required by the Regulations, or directives issued pursuant thereto, and shall permit access to its facilities as may be determined by the DEPARTMENT or the Federal Highway Administration (FHWA) to be pertinent to ascertain compliance with such Regulations or directives. Where any information required of a SERVICE PROVIDER is in the exclusive possession of another who fails or refuses to furnish this information, the SERVICE PROVIDER shall so certify to the DEPARTMENT, or the FHWA if appropriate, and shall set forth what efforts it has made to obtain the information.

e. Sanctions for Noncompliance: In the event of the SERVICE PROVIDER's noncompliance with the nondiscrimination provisions of this Agreement, the DEPARTMENT shall impose such Agreement sanctions as it or the FHWA, if appropriate, may determine to be appropriate, including, but not limited to:

1. Withholding of payments to the SERVICE PROVIDER under the Agreement until the SERVICE PROVIDER complies, and/or
2. Cancellation, termination, or suspension of the Agreement, in whole or in part.

f. Incorporation of Provisions: The SERVICE PROVIDER will include the provisions of Paragraphs (a) through (f) above in every subcontract including procurement of materials and leases of equipment, unless exempt by Regulations, order, or instructions issued

pursuant thereto. The SERVICE PROVIDER will take such action with respect to any subcontract or procurement as the DEPARTMENT, or the FHWA if appropriate, may direct as a means of enforcing such provisions including sanctions for non-compliance. In the event SERVICE PROVIDER becomes involved in or is threatened with litigation by a subcontractor or supplier as a result of such direction, the SERVICE PROVIDER may request the DEPARTMENT to enter into such litigation to protect the interests of the DEPARTMENT and the SERVICE PROVIDER may request the United States to enter into such litigation to protect the interests of the United States.

22. In the event federal funds are used for payment of all or part of this Agreement, the SERVICE PROVIDER, for itself, its assignees, and successors in interest agrees as follows:

a. Debarment and/or Suspension: The SERVICE PROVIDER certifies that neither it nor its subcontractors, nor their principals are presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any federal department or agency. SERVICE PROVIDER is subject to suspension and debarment actions as specified in 2 CFR part 1200 and 2 CFR part 180, potential cause of action under the False Claims Act as specified in 32 U.S.C. 3729-3733, and prosecution for making a false statement as specified in 18 U.S.C. 1020.

b. ADA: The SERVICE PROVIDER and subcontractor shall comply with all terms, conditions, and requirements of the Americans with Disabilities Act of 1980, as amended, and regulations adopted thereunder contained in 49 CFR, Part 27, and any relevant program-specific regulations.

c. Civil Rights: The SERVICE PROVIDER and subcontractor shall comply with the requirements of the Civil Rights Act of 1964, as amended, the Rehabilitation Act of 1973, as amended, and any relevant program-specific regulations, and shall not discriminate against any employee or person offered employment because of race, national origin, creed, color, sex, religion, age, disability, or handicap condition, including AIDS and AIDS-related conditions.

23. Each Party agrees to keep and maintain under generally accepted accounting principles full, true, and complete records and documents pertaining to this Agreement and present, at any reasonable time and upon reasonable advance written notice, such information for inspection, examination, review, audit, and copying at any office where such records and documentation are maintained. It is expressly understood that the duly authorized representatives of the DEPARTMENT, and the FHWA if appropriate, shall have the right to inspect/audit the professional services and charges of the SERVICE PROVIDER whenever such representatives may deem such inspection to be desirable or necessary. Such records and documentation shall be maintained for three (3) years after final payment is made.

24. To the fullest extent permitted by law, the SERVICE PROVIDER shall defend, indemnify, and hold harmless the State of Nevada, and the employees, officers, and agents of the State of Nevada from any liabilities, damages, losses, claims, actions, or proceedings, including, without limitation, reasonable attorney's fees, that State of Nevada may sustain, incur or be required to pay by reason of third party claims, demands and causes of action for damages resulting from personal injuries, loss of life or damage to tangible property to the extent or result caused by the negligence, errors, omissions, reckless, or intentional misconduct of the SERVICE PROVIDER or the employees or agents of the SERVICE PROVIDER in the performance of this Agreement. State of Nevada agrees to notify SERVICE PROVIDER in writing as soon as practical of any third-party claim, demand or cause of action for which State of Nevada will request indemnification from SERVICE PROVIDER. State of Nevada will provide SERVICE PROVIDER with the necessary information and assistance to defend or settle such claim, demand or cause of action. The obligations of SERVICE PROVIDER under this paragraph shall survive the expiration or termination of this Agreement.

25. The SERVICE PROVIDER shall use its own vehicles and the DEPARTMENT is not responsible for the payment of any premiums, deductible, or assessments on any insurance policies purchased by the SERVICE PROVIDER.

26. The SERVICE PROVIDER warrants that all deliverables and work produced under this Agreement shall be completed in a workmanlike manner consistent with standards in the trade, profession, or industry.

27. The SERVICE PROVIDER is required to register as a vendor with the Nevada State Controller's office. The Registration Substitute IRS Form W-9 can be accessed at http://controller.nv.gov/VendorServices/Vendor_Services.html. The SERVICE PROVIDER will follow the Registration Instructions, complete the Registration Substitute IRS Form W-9 and submit it to the State Controller's Office.

28. The SERVICE PROVIDER agrees that, prior to any sale, transfer, business name change, change in principals, or any other occurrence that alters this Agreement in any way, the SERVICE PROVIDER shall notify the DEPARTMENT of such intent at least seven (7) calendar days prior to making said change.

29. All notices or other communications required or permitted to be given under this Agreement shall be in writing and shall be deemed to have been duly given if delivered personally in hand, by telephonic facsimile with simultaneous regular mail, or mailed certified mail, return receipt requested, postage prepaid on the date posted, and addressed to the other Party at the address set forth below:

FOR DEPARTMENT:
Rudy Malfabon, P.E., Director
Attn: Denise Inda
Nevada Department of Transportation
Division: Traffic Operations
1263 South Stewart Street
Carson City, Nevada 89712
Phone: (775) 888-7080
E-mail: dinda@dot.nv.gov

FOR SERVICE PROVIDER:
Harris Legal Department
Harris Corporation
221 Jefferson Ridge Parkway
Lynchburg, VA 24501
Phone: (434) 455-9462
E-mail: pbeeson@harris.com

30. This Agreement and the rights and obligations of the Parties hereto shall be governed by, and construed according to, the laws of the State of Nevada. The Parties consent to the exclusive jurisdiction of the Nevada state district courts for enforcement of this Agreement.

31. As used herein the term "SERVICE PROVIDER" shall include the plural as well as the singular, and the feminine as well as the masculine.

32. Neither Party shall be deemed to be in violation of this Agreement if it is prevented from performing any of its obligations hereunder for any reason beyond its control, including, without limitation, strikes, inmate disturbances, acts of God, civil or military authority, act of public enemy, or accidents, fires, explosions, earthquakes, floods, winds, failure of public transportation, SERVICE PROVIDER's inability to timely obtain necessary materials, items, components or

services from suppliers who are affected by the foregoing circumstances, the failure of the DEPARTMENT to perform its obligations hereunder in a timely manner or any other similar serious cause beyond the reasonable control of either Party ("Excusable Delays"). In such an event the intervening cause must not be through the fault of the Party asserting such an excuse, and the excused Party is obligated promptly to perform in accordance with the terms of the Agreement after the intervening cause ceases.

33. In connection with the performance of work under this Agreement, the SERVICE PROVIDER agrees not to discriminate against any employee or applicant for employment because of race, color, religion, sex, national origin, age, disability, pregnancy, sexual orientation, genetic information (GINA) or gender identity or expression, including, without limitation, with regard to employment, upgrading, demotion or transfer, recruitment or recruitment advertising, layoff or termination, rates of pay or other forms of compensation, and selection for training, including without limitation apprenticeship. The SERVICE PROVIDER further agrees to insert this provision in all subcontracts hereunder, except subcontracts for standard commercial supplies or raw materials.

34. The DEPARTMENT and SERVICE PROVIDER shall keep all confidential information produced, prepared, observed, or received by the Parties to the extent that such information is confidential by law or otherwise required by this Agreement.

35. Pursuant to NRS 239.010, information or documents may be open to public inspection and copying. The DEPARTMENT will have the duty to disclose unless a particular record is confidential by law or a common law balancing of interests.

36. The SERVICE PROVIDER shall not assign or subcontract any of the work performed under this Agreement without the prior written approval of the DEPARTMENT through the Subcontractor/Service Provider Request process. Any assignment of rights or delegation of duties under this Agreement, without the prior written consent of the DEPARTMENT, shall be void.

37. The illegality or invalidity of any provision or portion of this Agreement shall not affect the validity of the remainder of the Agreement and this Agreement shall be construed as if such provision did not exist. The unenforceability of such provision shall not be held to render any other provision or provisions of this Agreement unenforceable.

38. Except as otherwise provided for by law or this Agreement, the rights and remedies of the Parties shall not be exclusive and are in addition to any other rights and remedies provided by law or equity, including, without limitation, the recovery of actual damages.

39. It is specifically agreed between the Parties executing this Agreement that it is not intended by any of the provisions of any part of this Agreement to create in the public or any member thereof a third-party beneficiary status hereunder, or to authorize anyone not a Party to this Agreement to maintain a suit for personal injuries or property damage, or pursuant to the terms or provisions of this Agreement.

40. The Parties hereto represent and warrant that the person executing this Agreement on behalf of each Party has full power and authority to enter into this Agreement and that the Parties are authorized by law to perform the services set forth herein.

41. This Agreement may be used by other State agencies, local governments, and public safety organizations as defined in NRS 332.015 and 47 CFR 90.20, who are intended third-party beneficiaries of this Agreement. Any local government may join or use this Agreement subject to all terms and conditions thereof pursuant to NRS 332.195. The State is

not liable for the obligations of any local government which joins or uses this Agreement to purchase subscriber equipment at the prices set forth in the pricing schedule and in accordance with the terms, including applicable warranties of this Agreement unless otherwise specified herein. This pricing cannot be combined with any other SERVICE PROVIDER promotional offers. Such local governments shall place their own order(s) directly with SERVICE PROVIDER, and SERVICE PROVIDER shall deal directly with any local government the DEPARTMENT approves to use this Agreement. The terms and conditions of this Agreement shall govern purchases by other local governments unless they and SERVICE PROVIDER agree to execute separate contracts. With the approval of SERVICE PROVIDER, any local government using this Agreement may add those terms and conditions required by statute, ordinances, or regulations. To the extent permitted by law, the parties may agree to additional or modified terms and conditions unique to the local government or as required by the circumstances surrounding the purchase. The DEPARTMENT, its officials and employees, are not responsible for placement of orders, invoicing, payments, contractual disputes, or any other transactions between SERVICE PROVIDER and any other local governments. In no event shall the DEPARTMENT, its officials or employees, be responsible for any costs, damages or injury resulting to any party from use of this Agreement. If, when preparing a local government contract, the additional terms and conditions of a local government seeking to purchase pursuant to a cooperative procurement are unacceptable to SERVICE PROVIDER, SERVICE PROVIDER may withdraw its consent to extension of this Agreement to that particular local government. The DEPARTMENT assumes no responsibility for any notification of the availability of this Agreement for use by other local governments, but SERVICE PROVIDER may carry out such notification.

42. This Agreement constitutes the entire agreement of the Parties and such is intended as a complete and exclusive statement of the promises, representations, negotiations, discussions, and other agreements that may have been made in connection with the subject matter hereof. Unless an integrated attachment to this Agreement specifically displays a mutual intent to amend a particular part of this Agreement, general conflicts in language between any such attachment and this Agreement shall be construed consistent with the terms of this Agreement. Unless otherwise expressly authorized by the terms of this Agreement, no modification or amendment to this Agreement shall be binding upon the Parties unless the same is in writing and signed by the respective Parties hereto and the Attorney General.

43. At the end of the term of this Agreement described in Article II – Performance, Paragraph 1, the SERVICE PROVIDER will be evaluated and that evaluation may be used for evaluation of future procurements.

44. The Statement of Work and Exhibits to this Agreement are expressly incorporated by reference and, together with this Agreement, constitute the Agreement Documents. In the event of a conflict among or between the Agreement Documents, the documents shall control in the order of precedence set forth below:

1. Amendments and Change Orders to this Agreement
2. This Agreement (not including the Exhibits and documents listed below)
3. Detailed Design Documents (this comes in after DDR)
4. Attachment A - Scope of Services, with Exhibits
5. Request for Proposal
6. Exhibit B - Software License Agreement
7. Proposal

IN WITNESS WHEREOF, the authorized representatives of the SERVICE PROVIDER and the DEPARTMENT have caused their names to be signed hereon on the date first above written.

HARRIS CORPORATION

DocuSigned by:
Thomas Clair
731831FEC90D430...

Thomas Clair, Contracts Manager
Name and Title (Print)

State of Nevada, acting by and through its DEPARTMENT OF TRANSPORTATION

DocuSigned by:
C4C7CE5CD584445...
Director

Approved as to Legality and Form:

DocuSigned by:
Lou Holland
524781170C844C7...
Deputy Attorney General

ACKNOWLEDGMENTS FOR SIGNER OF BOND [Use (a) or (b) and (c)]

(a) Contractor's Acknowledgment (if an Individual or Partnership)

STATE OF _____ } **SS**

COUNTY OF

On this _____ **day of** _____, **A.D.** _____, **personally appeared before me, a** _____, **in and for** _____ **County, State of** _____,

(Notary Public, Judge or other officer)

_____, **known (or proved) to me**

(Name)

to be the person(s) described in and executed the foregoing instrument, who acknowledged to me that he (they) executed the same freely and voluntarily and for the uses and purposes therein mentioned.

_____

(SEAL) (Notary Public, Judge or other officer)

(b) Contractor's Acknowledgment (if a Corporation)

STATE OF _____ } **SS**

COUNTY OF

On this _____ **day of** _____, **A.D.** _____, **personally appeared before me, a** _____, **in and for** _____ **County, State of** _____,

(Notary Public, Judge or other officer)

_____, **known (or proved) to me to be the** _____

(Name) (President, Vice President or Secretary)

of the corporation that executed the foregoing instrument, and, upon oath, did depose that he is the officer of said corporation as above designated; that he is acquainted with the seal of said corporation and that the seal affixed to said instrument is the corporate seal of said corporation; that the signatures to said instrument were made by officers of said corporation as indicated after said signatures; and that the said corporation executed the said instrument freely and voluntarily for the uses and purposes therein mentioned.

_____

(SEAL) (Notary Public, Judge or other officer)

(c) Acknowledgment for Bonding company

STATE OF _____ } **SS**

COUNTY OF

On this _____ **day of** _____, **A.D.** _____, **personally appeared before me, a** _____, **in and for** _____ **County, State of** _____,

(Notary Public, Judge or other officer)

_____, **known (or proved) to me to be the** _____

(Name) (Attorney in fact or other Officer)

of the corporation that executed the foregoing instrument, and, upon oath, did depose that he is the officer of said corporation as above designated; that he is acquainted with the seal of said corporation and that the seal affixed to said instrument is the corporate seal of said corporation; that the signatures to said instrument were made by officers of said corporation as indicated after said signatures; and that the said corporation executed the said instrument freely and voluntarily for the uses and purposes therein mentioned.

_____

Notary Public, Judge or other officer

(SEAL)

APPROVAL OF BOND

Approved _____, _____ _____

Deputy Attorney General of the State of Nevada

ACKNOWLEDGMENTS FOR SIGNER OF BOND [Use (a) or (b) and (c)]

(a) Contractor's Acknowledgment (if an Individual or Partnership)

STATE OF _____ }
COUNTY OF _____ } **SS**

On this _____ **day of** _____, **A.D.** _____, **personally appeared before me, a** _____, **in and for** _____ **County, State of** _____,
(Notary Public, Judge or other officer)

_____, **known (or proved) to me**
(Name)

to be the person(s) described in and executed the foregoing instrument, who acknowledged to me that he (they) executed the same freely and voluntarily and for the uses and purposes therein mentioned.

(SEAL) _____
(Notary Public, Judge or other officer)

(b) Contractor's Acknowledgment (if a Corporation)

STATE OF _____ }
COUNTY OF _____ } **SS**

On this _____ **day of** _____, **A.D.** _____, **personally appeared before me, a** _____, **in and for** _____ **County, State of** _____,
(Notary Public, Judge or other officer)

_____, **known (or proved) to me to be the** _____
(Name) (President, Vice President or Secretary)

of the corporation that executed the foregoing instrument, and, upon oath, did depose that he is the officer of said corporation as above designated; that he is acquainted with the seal of said corporation and that the seal affixed to said instrument is the corporate seal of said corporation; that the signatures to said instrument were made by officers of said corporation as indicated after said signatures; and that the said corporation executed the said instrument freely and voluntarily for the uses and purposes therein mentioned.

(SEAL) _____
(Notary Public, Judge or other officer)

(c) Acknowledgment for Bonding company

STATE OF _____ }
COUNTY OF _____ } **SS**

On this _____ **day of** _____, **A.D.** _____, **personally appeared before me, a** _____, **in and for** _____ **County, State of** _____,
(Notary Public, Judge or other officer)

_____, **known (or proved) to me to be the** _____
(Name) (Attorney in fact or other Officer)

of the corporation that executed the foregoing instrument, and, upon oath, did depose that he is the officer of said corporation as above designated; that he is acquainted with the seal of said corporation and that the seal affixed to said instrument is the corporate seal of said corporation; that the signatures to said instrument were made by officers of said corporation as indicated after said signatures; and that the said corporation executed the said instrument freely and voluntarily for the uses and purposes therein mentioned.

_____
Notary Public, Judge or other officer

(SEAL)

APPROVAL OF BOND

Approved _____, _____ _____
Deputy Attorney General of the State of Nevada

FORM OF PERFORMANCE BOND

Performance Bond No.:

For

_____**Project**

KNOW ALL WHO SHALL SEE THESE PRESENTS:

THAT WHEREAS, the Nevada Department of Transportation (the "Obligee"), a state agency of the State of Nevada has awarded to HARRIS CORPORATION (the "Principal"), a contract dated _____ for the following work: REPLACEMENT OF THE NEVADA SHARED RADIO SYSTEM.

AND WHEREAS, it is required by law and is one of the conditions of the Contract that these presents (this "Performance Bond") shall be executed;

NOW THEREFORE, We the undersigned Principal and

Travelers Casualty and Surety Company of America ("Surety")

One Tower Square, Hartford, CT 06183

are firmly bound and held unto the Obligee, in the penal sum of _____Dollars ($_____), good and lawful money of the United States of America. For the payment of the penal sum, well and truly to be paid to the Obligee, we bind ourselves, our heirs, successors, executors, administrators, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THE FOREGOING OBLIGATION IS SUCH THAT:

1. **THESE PRESENTS** shall become null and void only if the Principal, its heirs, executors, administrators, successors, or assigns, shall (a) in all things stand to and abide by, and well and truly keep and faithfully perform the covenants, conditions, and agreements, obligations and work under the Contract, including any and all amendments, supplements, and alterations made to the Contract as therein provided, on the Principal's part to be kept and performed at the time and in the manner therein specified, and in all respects according to their true intent and meaning, (b) indemnify and save harmless the Obligee, its directors, officers, and agents, as therein stipulated, and (c) reimburse upon demand of the Obligee any sums paid the Principal which exceed the final payment determined to be due upon completion of the Project; otherwise they shall remain in full force and effect.

2. **THE OBLIGATIONS** covered by this Performance Bond specifically include liability for liquidated damages and warranties as specified in the Contract, but not to exceed the penal sum.

3. **THE SURETY**, for value received stipulates and agree(s) to thefollowing:

(a) That no change, extension of time, alterations, additions, omission, or other modification of the terms of the Contract, or in the work to be performed with respect to the Project, or in the specifications or plans, or any change or modification of any terms of payment or extension of time for any payment pertaining or relating to the Contract, or any conditions precedent or subsequent in this Bond attempting to limit the right of recovery of claimants otherwise entitled to recover under this Bond, or any fraud practiced by any other person other than the claimant seeking to recover this Bond, shall in any way affect its obligations on this Bond, and it does hereby waive notice of such changes, extension of time, alterations, additions, omissions or other modifications.

(b) That payments made to contractors and suppliers to satisfy claims on the payment bond furnished under the Contract do not reduce the Surety's legal obligations under this Performance Bond. Payments made to contractors or suppliers under any

agreement where the Surety has arranged for completion of the work to satisfy this Performance Bond will not be considered payment bond claims.

(c) That whenever the Principal shall be, and is declared by the Obligee to be, in default under the Contract, provided that the Obligee is not then in material default thereunder, the Surety, if requested to do so by the Obligee, shall commence within twenty (20) calendar days after notice from the Obligee thereofto:

(i) Remedy such default, or

(ii) Complete the work covered by this Performance Bond, in accordance with the terms, conditions, and covenants of the Contract then in effect, or

(iii) Select a contractor or contractors to complete all work covered by this Performance Bond in accordance with the terms, conditions, and covenants of the Contract then in effect, using a contractor or contractors approved by the Obligee as required by the Contract (provided, however, that the Surety may not select the Principal or any affiliate of the Principal to complete the work for and on behalf of the Surety without the Obligee's express written consent), arrange for a contract, meeting the requirements of the Agreement, between such contractor or contractors and the Obligee, and make available as work progresses (even though there should be a default or a succession of defaults under such contract or contracts of completion arranged under this paragraph) sufficient funds to pay the cost of completion less the unpaid balance of the contract price; but not exceeding, including other costs and damages for which Surety is (are) liable hereunder, the bonded sum.

(d) That should Obligee incur attorney's fees or other expenses for the enforcement of the Contract or this Performance Bond, the same shall be paid by Surety to the Obligee.

THE SURETY hereby certifies that it is duly authorized by certificate of authority issued by the State of Nevada Division of Insurance, that the seal affixed hereto is the corporate seal of said SURETY, that the signatures to said instrument were made by officers of said SURETY as indicated after said signatures; and that the said SURETY executed the said instrument freely and voluntarily for the uses and purposes therein mentioned.

THE PRINCIPAL hereby certifies that the seal affixed hereto is the corporate seal of said PRINCIPAL, that the signatures to said instrument were made by officers of said PRINCIPAL as indicated after said signatures; and that the said PRINCIPAL executed the said instrument freely and voluntarily for the uses and purposes therein mentioned.

By: _____

Attorney in Fact (on file with the NV Division of Insurance)

Name:

Date:

<<**Principal**>>

BY: _____

Signature on behalf of Principal

Name and Title:

By: _____

Countersigning Producer appointed by Surety

Name:

Date:

NV License No.:

_____

Name of Resident Agent

_____

Resident Agent Street Address

_____

Resident Agent City and State

NOTE TO SURETY ON BOND: Certificates of authority for Attorneys in Fact must be on file with the Department of Transportation and the Insurance Commissioner of the State of Nevada.

Approval of Bond

Bond No(s):

Deputy Attorney General of the State of Nevada Date

PAYMENT BOND

Whereas, the Nevada Department of Transportation, hereinafter designated as "NDOT", has awarded to, (Contractor Name and Address) hereinafter designated "PRINCIPAL", a Contract dated _____,_____, 20__ for the following work: Construction of a portion of the (Highway Type) Highway System in _____ County, (Location and Description); and

Whereas, PRINCIPAL is required under the terms of said Contract and by law to furnish a Bond for the performance of said Contract;

Now therefore, we PRINCIPAL, and

_____

, (Name and Address of Bonding Company Main Office)

hereinafter designated "SURETY", are held and firmly bound unto NDOT, in the sum of _____ ($_____), lawful money of the United States, being not less than one hundred percent (100%) of the estimated contract cost of the work, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that if the above-bounden PRINCIPAL□s heirs, executors, administrators, successors, or assigns, shall fail to pay for any materials, provision, supplies, implements or machinery used in, upon, for, or about the performance of the work contracted to be done, or for any work or labor thereon of any kind, together with interest at the rate of twelve percent per annum, or for amounts due under the Unemployment Compensation Law with respect to such work or labor, as required by the provisions of NRS 612, and provided that the claimant shall have complied with the provisions of NRS 408.363, SURETY hereon will pay the same within thirty (30) calendar days an amount not exceeding the sum specified in this Bond, and the above obligation shall then be null and void. Otherwise, it shall remain in full force and virtue.

SURETY, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of Contract, or to the work to be performed thereunder, shall in any way affect its obligation on this Bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Contract or to the work.

This Bond shall inure to the benefit of any person who provides materials, provisions, supplies, trucks, other means of transportation, work or labor to complete the work called for in the contract, as to give a right of action to such persons or their assigns in any suit brought upon this Bond.

And SURETY, for value received, further stipulates and agrees that should NDOT or other obligees, incur attorney's fees or other expenses for the enforcement of the Contract or this Bond, the same shall be paid by SURETY to NDOT, subcontractors, workmen, laborers, mechanics, and furnishers of the materials as their interests may appear.

_____	_____
Authorized Agent	Contractor
_____	**By:** _____
Agency Name	
_____	_____
Agency Address	Name of Authorized Signer
_____	_____
Agency Address	Title of Signer

The Surety Company hereby certifies that they are duly authorized by certificate of authority issued by the State of Nevada Division of Insurance.

By: _____

Attorney-in-Fact

Power of Attorney Form must be attached.

Approval of Bond

_____

Deputy Attorney General of the State of Nevada Date

Bond No(s).:

LIST OF ATTACHMENTS

Attachment A – SCOPE OF SERVICES (with Exhibits)
Attachment B – SOFTWARE LICENSE AGREEMENT
Attachment C – BACKGROUND INVESTIGATION FORMS
Attachment D – CHANGE ORDER

ATTACHMENT A

SCOPE OF SERVICES

TABLE OF CONTENTS

System Description

Introduction

The new P25 Phase 1/Phase 2 700/800 MHz radio system for the State of Nevada will include 127 RF sites; 7 simulcast systems; 1 VIDA Premier HA Core; 2 VIDA Premier/Connect HA Cores; 4 ISSI interfaces; 75 CSSI connections; 34 NCRN sites; 156 Conventional connections for interoperability; 27 new Symphony consoles; 24 NDIP sites; 6 redundant logging recorders from Exacom; 6 Site-on-Wheels; 2 Asset Management Systems from MCM, and 26 Network Management Terminals. This Statement of Work (SOW) addresses NDOT's portion of the NSRS.

System Outline

The system consists of the following main elements:

- **Network System Control:** Harris will provide the primary VIDA Premier Core at Las Vegas SANS and the secondary VIDA Premier Core at Washoe NOC location. One VIDA Premier/Connect HA Core will be provided to support 70 site locations for NDOT, NV Energy and Washoe County in the northern region and one VIDA Premier/Connect HA Core will be provided to support 57 site locations for NDOT and NV Energy in the southern region. For the VIDA Connect Core – North, the primary core will be located at Washoe NOC and the secondary core at Edison Way in Reno, NV. For the VIDA Connect Core – South, the primary core will be located at the Fast Center and the secondary core at the Beltway site in Las Vegas. The VIDA Premier and VIDA Premier/Connect Cores support state-wide agency communications with management and administration services. The VIDA Premier/Connect cores are designed to work with the VIDA Premier Core.
- **RF Sites:** Harris will provide RF subsystem (base station and antenna system) equipment for 70 NDOT repeater sites linked to the VIDA Premier/Connect Cores (northern and southern regions) via Member's existing microwave IP network. RF Sites consist of 100-Watt P25 Phase 1/Phase 2, 700 or 800 MHz MASTR V base stations utilized for voice and data traffic. Five sites will use low-powered MASTR V stations and be powered by NDOT provided solar equipment. The new system will include 34 NCRN

cross-band repeater sites and three sites-on-wheels (SOW). Two SOWs include 4, 700 MHz channels and one SOW includes one 800 MHz conventional channel.

- **Network Management System (NMS):** Harris will provide one Network Management and Administration system, located on the active VIDA Premier Core, accessible by any authorized console/user on the radio network through a secure web connection. The management application will provide a tool for performance tracking, event and fault monitoring, and reporting. The administration application configures, provisions, and administers the P25 network database.
- **Interoperability Solution:** Harris will provide a P25 compliant Harris ISSI/CSSI. The ISSI allows NDOT to connect to neighboring P25 systems while the CSSI is the interface to allow other external manufacturer's consoles to interoperate on the Harris VIDA system with the required interfacing equipment. The ISSI will be licensed for 4 concurrent system connections supporting 3 P25 system connections and one CSSI connection that will be configured to support interoperation with 75 consoles. Those consoles must support ISSI/CSSI connectivity as well for configuration and interoperation of all supported features. The ISSI/CSSI will be located on the Primary VIDA Premier Core at Las Vegas SANS. Please see the ISSI Gateway section for more details.
- **Cross Band Repeaters:** Harris will provide new VHF and 800 MHz base stations at 34 total NCRN sites to replace existing equipment and to equip future sites. Harris will reuse existing EDACS antenna system equipment as instructed for both the new and existing 800 MHz NCRN equipment. Poito and Peavine NCRN equipment will be incorporated into the new P25 antenna system at these sites.
- **Dispatch Solution:** The NDOT P25 System includes 9 new Symphony Consoles. Harris will upgrade 20 existing Symphony consoles to Windows 10. Existing console licenses will be transferred to new Cores.
- **Logging Recorder:** A single logging recorder with redundant components will record all radio traffic from NDOT's RF sites, Symphony consoles, and telephone audio. The Exacom logging recorder will interface directly into NDOT's VIDA Premier/Connect Cores. A second logging recorder with redundant components will record radio traffic for DPS.

- **Subscribers**: New radios include mid, and low tier models of mobiles, portables and base stations/control stations to accommodate various users. All radios will include Link Layer Authentication. See radio details under Subscriber Equipment.

Description of the System

The new system will support Project 25 Phase 1 and Project 25 Phase 2 technology. The new system will provide coverage enhancements with a Delivered Audio Quality (DAQ) of 3.4 or better, increased user capacity, and functionality compared to the EDACS radio system it replaces. Harris will replace NDOT's existing EDACS system with Voice Interoperability Data Access (VIDA) P25 technology. The VIDA system will allow NDOT to maintain a cluster of sites covering its operational area. Figure 1, Figure 2 and Figure 3 depict high-level system block diagrams of the entire NSRS network, identifying which of those assets belong to NDOT.

Figure 1. System Block Diagram – Primary VIDA Premier Core – South / Secondary VIDA Premier Core – North Premier Cores Main

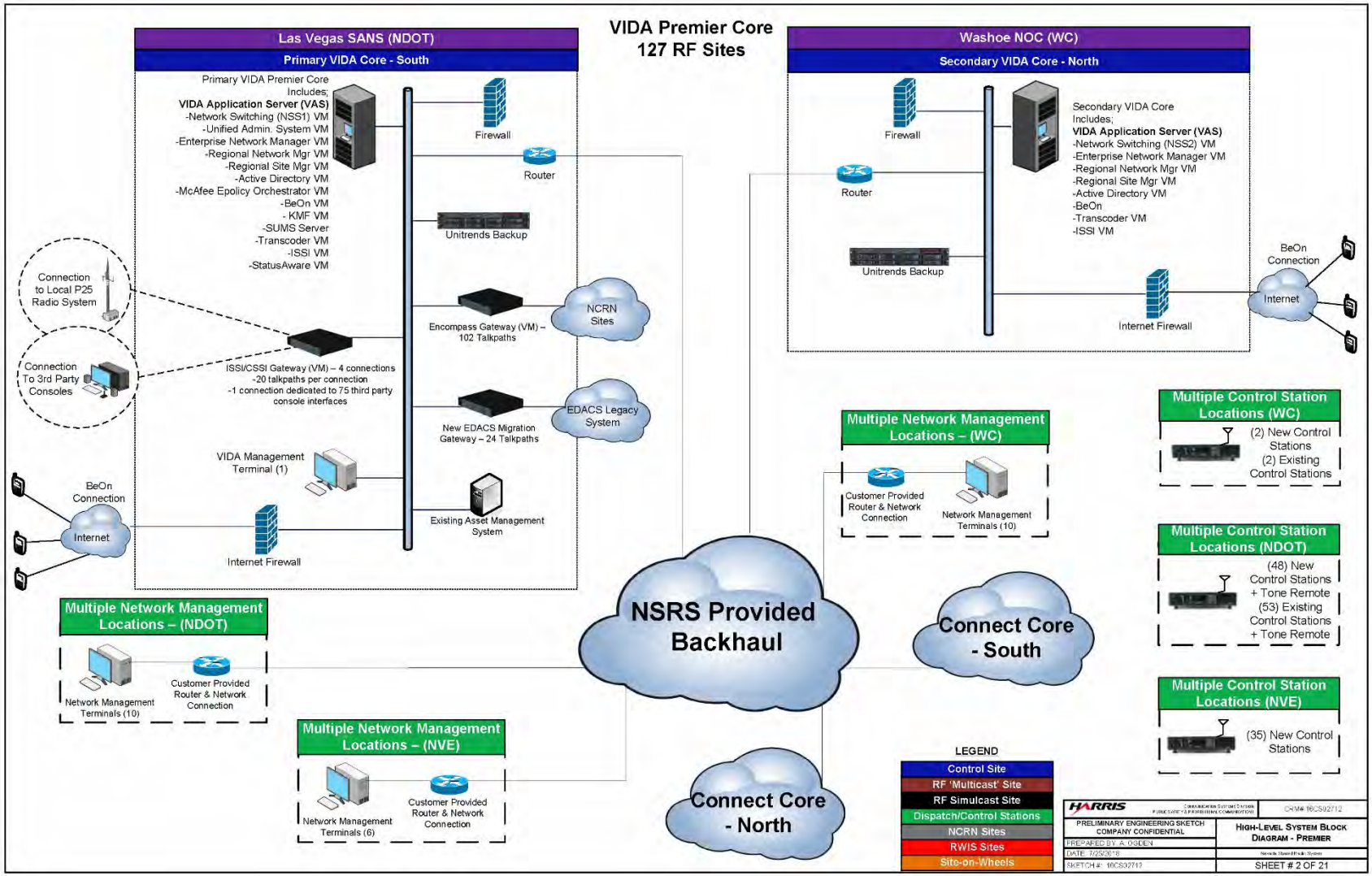


Figure 2. System Block Diagram –VIDA Premier/Connects North

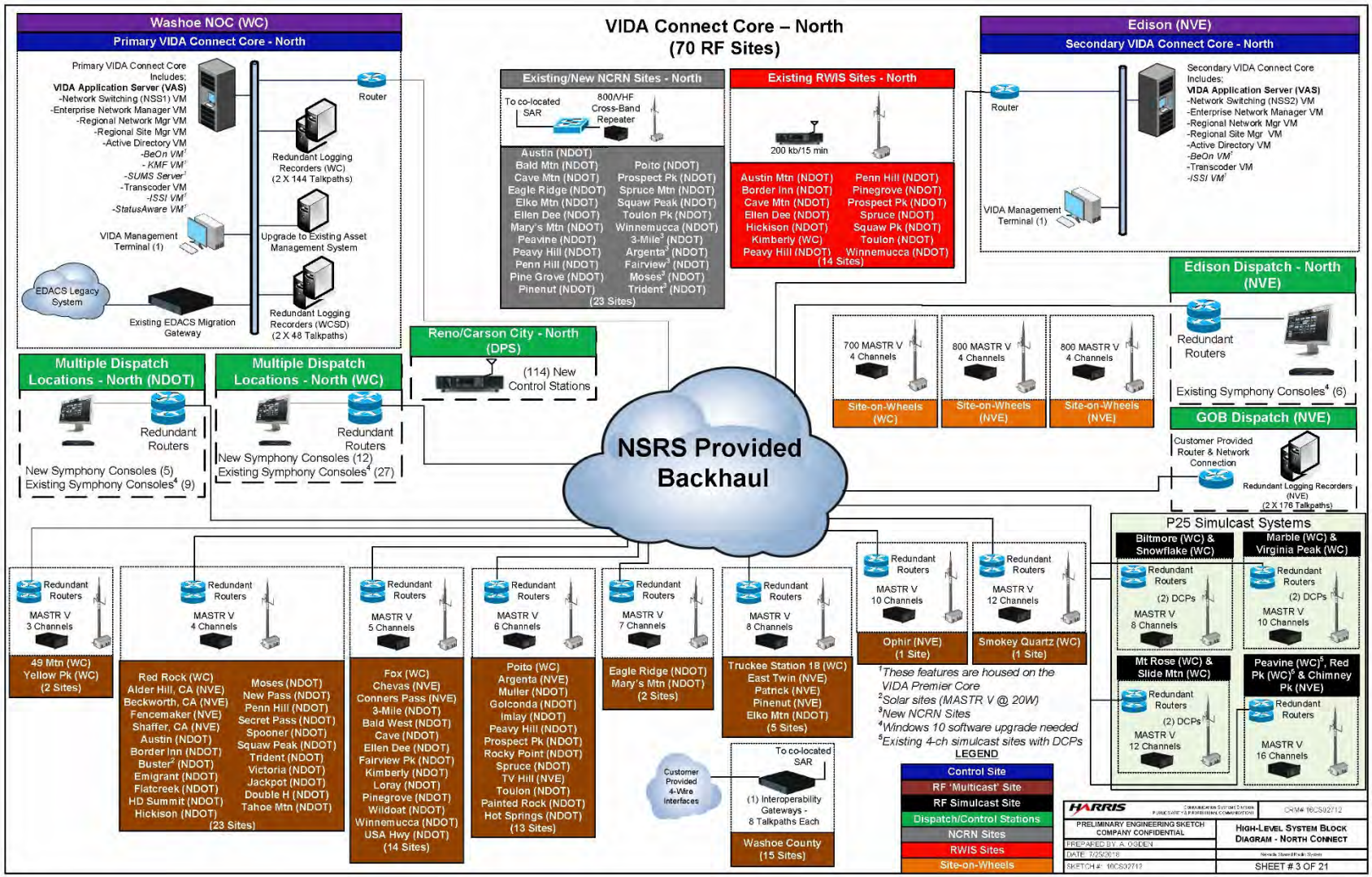
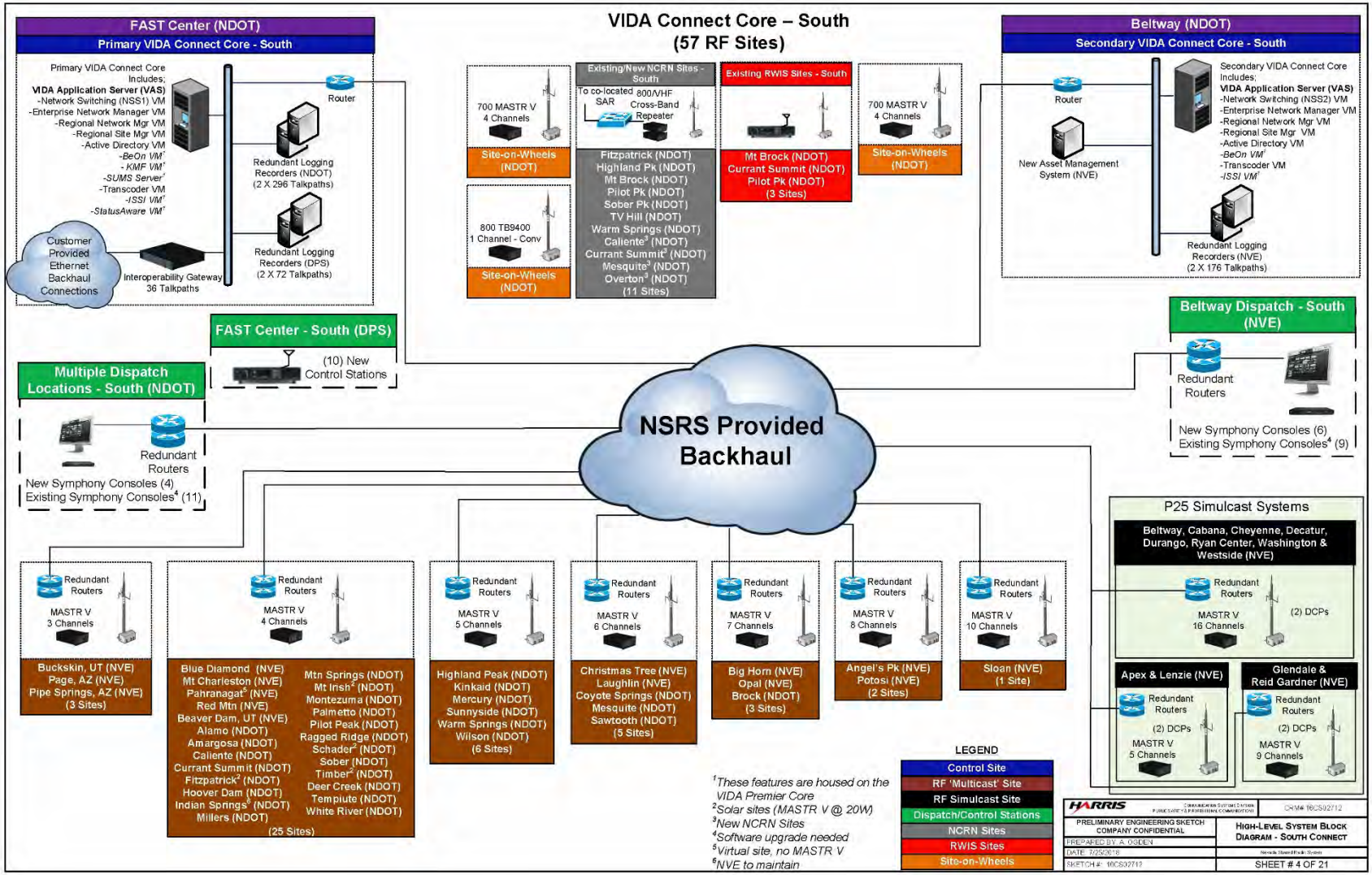


Figure 3. System Block Diagram – VIDA Premier/Connects South



Elements of the VIDA System Design

VOICE, INTEROPERABILITY, DATA, AND ACCESS (VIDA) CORE LOCATIONS

With the new P25 system, NDOT will have a set of geographically-separated, high-availability cores fully integrated together to link all aspects of the NSRS to work as a single statewide system. The NSRS VIDA Premier/Connect Cores will control the NDOT sites and consoles. Harris will install VIDA Premier and VIDA Premier/Connect Cores at the following locations:

- Las Vegas SANS (NDOT) – primary VIDA Premier Core
- Washoe NOC (Washoe) – secondary VIDA Premier Core
- Las Vegas FAST Center (NDOT) – primary VIDA Premier/Connect Core –- South
- Las Vegas Beltway (NDOT) – secondary VIDA Premier/Connect Core –- South
- Washoe NOC (Washoe) - primary VIDA Premier/Connect Core – North
- Edison (NVE) – secondary VIDA Premier/Connect Core – North

These locations will be supported by Members backhaul connectivity utilizing fiber optics and microwave Ethernet technology. The VIDA Premier Core will provide the following features:

Announcement Group	Deregistration	Global Positioning Satellite*	Over-the-Air-Programming	Recent User Priority
Automatic Site Registration	Dynamic Regrouping	Group Call	Over-the-Air-Rekeying	System-wide Calls
Automatic Site Switching	Emergency Alert	Link layer Authentication	Private Call	Talk Prohibit Tone
Busy Queuing and Callback	Emergency Call	Multigroup Call	Push-to-Talk ID	User Authentication
Call Alert	Enhanced Priority Levels	Out of Range Indication	Radio Inhibit	Voice Encryption

*See StatusAware section below.

StatusAware will provide situational awareness to all GPS-capable radios and allows output of situational data to external sub-systems like CAD and internal sub-systems such as BeOn devices. With In-band GPS, a radio provides GPS status updates when the radio transmits. Harris will provide the StatusAware feature and provide NDOT with 50 licenses. Mapping software, if required, is the responsibility of NDOT.

A centralized management solution located on the VIDA Premier Core will allow common management for NDOT and other Members Cores. With multiple management priority levels available, NDOT can determine which level of access is appropriate for each user ID. Harris will provide NDOT with one VIDA Management Terminal located at the primary VIDA Premier Core. Each NDOT Core will be housed in a seismic-Zone-4 rated 84” cabinet.

INTEROPERABILITY

The VIDA architecture will give NDOT the ability to address interoperability at the network, system and radio to radio levels. Harris will provide the following interoperability elements as part of the P25 radio system.

ISSI GATEWAY

The Inter-RF Subsystem Interface (ISSI) provides P25 TIA-standardized network-level communication between P25 radio systems, regardless of system manufacturer, and the VIDA radio system. The ISSI will be virtualized on the VIDA Application Server (VAS) located in the Las Vegas VIDA Premier Core. Its primary functions will be to manage calls, entity tracking, and registration between the local VIDA system and other RF Subsystems (RFSSs). In addition to inter-system communication, the ISSI service will provide the interface that enables radios to roam between systems. The system will support additional connections by adding another ISSI server to the radio system.

The ISSI will be configured to support four separate system interface connections. One is for the CSSI and 3 are for the ISSI. Each of the four ISSIs will be licensed to support 20 simultaneous talkpaths. Connections and integration services to external systems is not included in this contract. Harris will quote a scope of services to connect the VIDA P25 system to another system upon request once NDOT and NSRS identifies those systems and the scope of integration. Please note, connectivity, licenses, and any other related equipment which must

be purchased by the foreign system is the responsibility of NDOT. The ISSI interface to a foreign system does not include support for EDACS talkgroups.

CSSI GATEWAY

CSSI is a function of the ISSI application and will connect to a corresponding 3rd party infrastructure CSSI to allow use of 3rd party consoles. One gateway will be required at the system VIDA Premier Core and another is required at the corresponding agency dispatch center along with a core or control point to interface into the VIDA network. The CSSI will be located on the Las Vegas SANS VIDA Premier Core.

The CSSI will be designed to support 75 consoles from other manufacturers. Each CSSI server will require an external connection license. Harris will quote a scope of services to connect the CSSI to 3rd party consoles upon request once NDOT and NSRS identifies those consoles, locations and the scope of integration.

EDACS MIGRATION GATEWAY

The EDACS Migration Gateway (EMG) will provide integration between the existing EDACS system and the P25 Phase 1/Phase 2 system during transition. NDOT's new 24-channel, EDACS Migration Gateway will be housed at the Primary VIDA Premier location in the south and Washoe County's existing EDCAS Migration Gateway will be housed at the secondary VIDA Premier location in the north. Both will be used to align with the migration plan and the user transition phases.

INTEROPERABILITY GATEWAY

Harris will provide the Interoperability Gateway that provides a basic level of interoperability on the P25 radio system, permitting system-level audio connectivity with legacy trunked and conventional analog radio systems, regardless of manufacturer or frequency band. The Interop Gateway in Figure 4 will be configured to support conventional 4-wire E&M resources to interconnect with other devices.

Each gateway chassis can support up to 12 interfaces. The Interop Gateways are located at the VIDA Premier/Connect Core – South at the NDOT FAST Center. Members are responsible for backhaul to these gateways. Harris has included a total of 36 interfaces for conventional resources located throughout the state. Please note, gateways or the radio resources which provide the RF access must be within the coverage of the radio sites or systems they are

intended to bridge. The gateways will be housed in open equipment racks having a seismic-Zone-4-rating and share the VIDA Core networking equipment.

Figure 4. VIDA Interoperability Gateway Chassis

DIGITAL FIXED STATION INTERFACE

Digital Fixed Station Interface is the protocol used when a dispatch console wants to connect to a P25 conventional system or an analog conventional system. The Encompass Gateway service will be virtualized as part of the VAS located on the VIDA Premier Core and supports connecting 102 DFSI base stations via an IP connection directly to the VIDA Core.

Site Design

The NDOT system design includes P25 trunked multicast sites and NCRN cross band repeater sites. The total number of P25 sites is 72, with 42 of the sites connected to the northern Connect Core and 30 sites connected to the southern Connect Core. The total number of cross band repeater sites is 34, with 23 sites connected to the North Connect Core and 11 sites connected to the South Connect Core.

The selection of RF sites for the P25 system is the foundation upon which coverage, system efficiency and cost effectiveness is built. Harris leveraged 60 existing sites to maintain coverage and added 11 new candidate sites to improve coverage for NDOT. The final site list is in the Site Details attachment, Exhibit 1a.

The 11 new candidate sites selected include three sites identified as currently under construction by NDOT.

- Deer Creek
- Double H
- Hot Springs
- Indian Springs
- Mtn Springs

- S. of White River
- Tahoe Mtn
- Tempiute
- Jackpot (under construction by NDOT)
- Painted Rock (under construction by NDOT)
- USA Hwy (under construction by NDOT)

Sites that will require FAA filing due to proximity to local airports are listed below. NDOT will fill out and submit all documentation required for FAA filing.

- Deer Creek
- Double H – Humboldt Co.
- Indian Springs
- Mtn Springs
- Tahoe Mtn

Using the existing EDACS site licenses as a guide, Harris optimized the coverage design to achieve maximum licensable ERP where possible and maintain a path-balanced system design. Every site will use tower-top amplifiers (TTA); however, Harris recommends its engineers and the engineers of the NDOT revisit TTA use at all sites based on the real-world noise floor levels at each site. Harris will benchmark noise floors levels at each site before installing equipment. Any noise floor related issues identified before installation of Harris equipment will be handled as a change order.

Multisites

Seventy-two (72) multicast sites make up the coverage for the NDOT portion of the NSRS system. These sites will be configured with a minimum of 4 channels up to a maximum of 8 channels. The equipment will be housed in 84”, seismic-Zone-4-rated, open, equipment racks. These sites will be integrated between the north and south VIDA Premier/Connect cores as depicted in Figures 2 and 3. The final site list is in the Site Details attachment, Exhibit 1a.

In-building Coverage

Harris will guarantee DAQ 3.4 coverage up to a level of 18 dB in the critical buildings listed in Figure 5. These buildings will be measured after a region has been placed into service. In the case where a building fails DAQ 3.4 testing, measurements will be taken both immediately

around the building as well as inside the building in a small area centered on each failed test location. The building loss at a test location is defined as the difference between the mean of the outside measurements minus the 95th percentile of the inside measurements at the failed test location. The 95th percentile is the signal level that is exceeded by 95% of the measurements.

If the building loss is measured to be greater than 18 dB, Harris will quote the price to purchase and install BDAs at all necessary locations. Inbuilding coverage test details are in Exhibit 9 Coverage Character Test, Section 5.

Figure 5. Critical Buildings

BDA Required	Address	City	Current BDA
Stewart Facility	1721 E. Snyder Ave.	Carson	
Belrose Office Building	700 Belrose Street	Vegas	
Rawson-Neal Hospital	1650 Community College Drive	Vegas	
Grant Sawyer	555 E. Washington Ave.	Vegas	
AG Office	100 N. Stewart Street	Carson	
Welfare & Support Services	100 North Carson Street	Carson	
Department of Taxation	1550 E College Parkway	Carson	
Richard Bryan Building	901 S Stewart Street	Carson	
DHHS	4126 Technology Way	Carson	
DMV	555 Wright Way – 2nd Floor	Carson	
NDOT HQ	1263 S. Stewart St	Carson	*
NDOT Hot Springs Annex	1301 Old Hot Springs	Carson	*
State Capital building	101 N. Carson Street	Carson	*
Legislature Building	401 S. Carson Street	Carson	*

Site-on-Wheels (SOW)

NDOT has 3 existing site-on-wheels trailers to house radio equipment. Harris will provide only the radio equipment and equipment specifications for two, 4 channel P25 radio site and a single 1-channel 800 MHz conventional site. Installing the P25 radio equipment into the existing site-on-wheels trailers is the responsibility of NDOT.

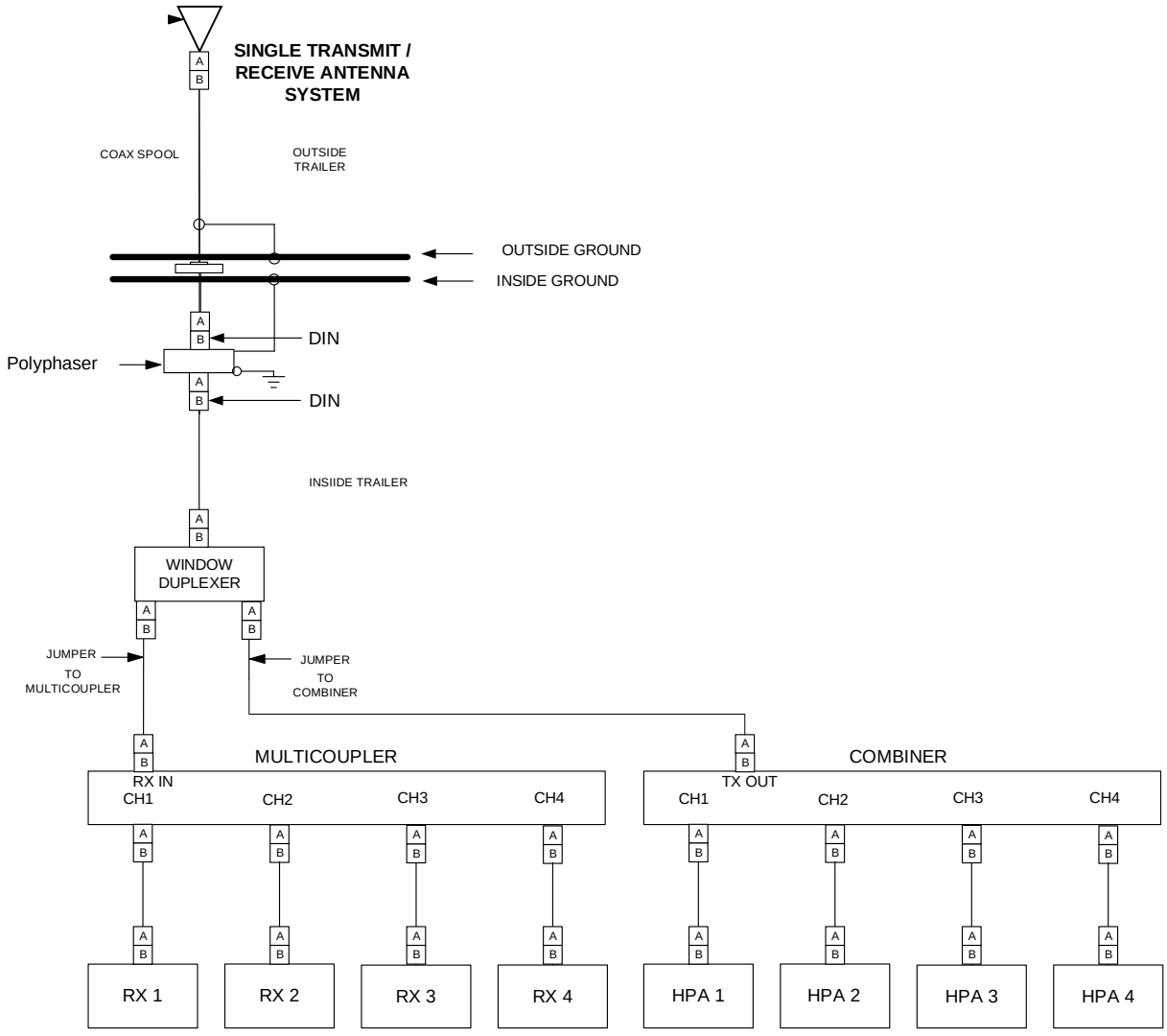
Harris will provide NDOT the following equipment for two existing trailers:

1. Antenna System
2. P25 4 Channel Site

SOW Antenna System

Harris will provide a single antenna for both transmit and receive. The antenna system pictured in Figure 6 below, will connect to the MASTR V repeaters. Polyphasers will provide lightening protection in combination with a suggested inside and outside ground bar when connected to temporary ground system on location.

Figure 6. Antenna System Configuration



SOW P25 4 Channel Site Equipment

Harris will provide a 4-channel MASTR V base station for NDOT to install in each trailer. Channel hardware is modularized and has some special requirements for heat transfer and

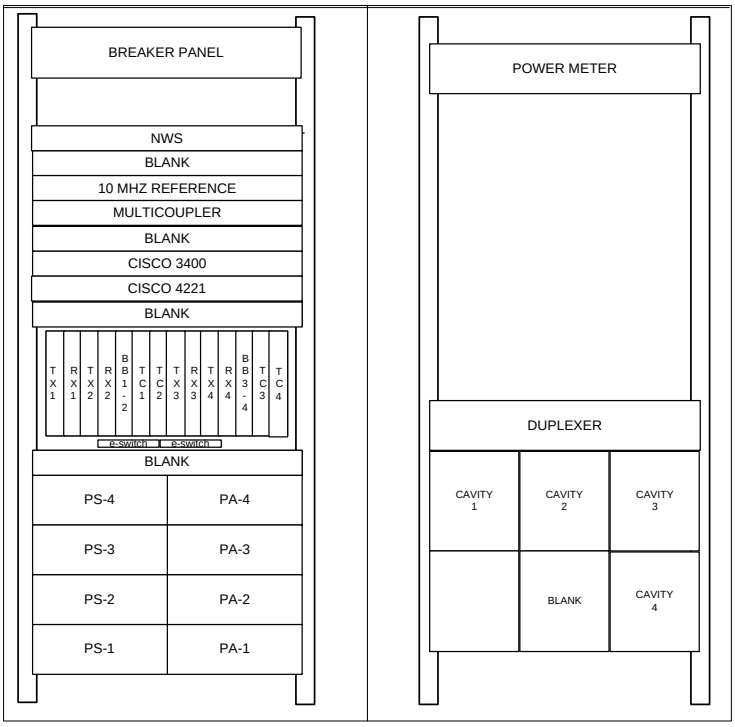
grounding to maintain FCC compliance and certification. The equipment rack will house the following equipment for trunked site operation:

1. Transceiver Chassis – consists of:
    a. Channel 1-4 Traffic Controller
    b. Channel 1-4 Baseband Module (2 required for 4 Channels)
    c. Channel 1-4 Receive Modules
    d. Channel 1-4 Transmit Modules
    e. Channel 1-4 Backplane Switch - primary
    f. Channel 1-4 Backplane Switch - secondary
2. High Power Amplifiers Section – consists of:
    a. Channel 1-4 High Power Amplifier Chassis
    b. Channel 1-4 High Power Amplifier
    c. Channel 1-4 Power Supplies (-48VDC)
3. Combiner Section – consists of:
    a. Channel 1-4 Ceramic Combiner
    b. Combiner Junction
    c. Power Meter
4. Network and Ancillary Equipment – Consists of:
    a. CISCO Router
    b. CISCO Switch
    c. Network Sentry Alarm Monitor
    d. 10 MHz Reference
    e. Receiver Multi-coupler
5. Power Distribution- consists of:
    a. DC Breaker Panel
    b. Power Block Wiring

SOW P25 Site Cabinets

The P25 site equipment will be divided into two separate rack spaces. The P25 related hardware has a footprint of 24 inches wide by 24 inches deep and requires a 4-post rack. The combiner and duplexer will be in a separate rack space as shown in Figure 7.

Figure 7. P25 Site Cabinets



NDOT is responsible for verifying rack space requirements are met in the trailers.

SOW Equipment Power Requirements

Harris equipment will be powered by -48 V DC. NDOT is responsible for providing all power connections and power back-up equipment and identifying demarcation points. The equipment planned for the transportable site is listed in Figure 8.

Figure 8. P25 Site Equipment Power Requirements

Equipment	Voltage
Base Stations / Repeaters	**-48V DC**
MASTR V P25 Trunked	-48V DC
Network Sentry	-48V DC

Equipment	Voltage
Cisco Router 4221	-48V DC
Cisco Switch 2960	-48V DC
MASTR V Fan Tray	-48V DC
Rx Multicoupler (8-channel)	-48V DC
Brandywine Reference Oscillator	-48V DC

SOW -48VDC Plant Power Requirements

Power requirements for Harris equipment are listed in Figure 9. DC Plant is the responsibility of NDOT.

Figure 9. DC Plant Power Requirements

Battery Recharge Time-Hours	24
Battery Run Time-Hours	.5
Battery Amp Hours	33
Battery re-charge Current	1.5
Rectifier Size-Load Amps	**66.7**

SOW GENERATOR REQUIREMENTS

The Generator requirements to support the P25 site equipment, are listed in Figure 10:

Figure 10. Generator Requirements

Requirement	Rating
Generator Rating	15KW
Fuel Type	Propane
Voltage Output	120/240
Fuel Supply	80 Gal
Electric Start	12 VDC

NDOT is responsible for providing adequate back-up and or generator equipment.

SOW AIR CONDITIONING REQUIREMENTS

Harris equipment requires 1400 BTUs to cool the radio equipment. Cooling requirements addressed ambient temperature, desired enclosure temperature of 75^{o}F, heat load, and location in direct sunlight.

SOW GROUNDING SYSTEM

Harris equipment requires an interior and exterior ground according to the Harris grounding specification for sites. While this a transportable site, proper grounding is extremely important to provide safety for the equipment and any personnel within proximity of the trailer and tower. Temporary grounding posts at the location must be provided once the trailer location is established. All site grounding is the responsibility of NDOT.

800 MHz Conventional Site on Wheels (SOW)

Harris will provide one, 1 Channel 800 MHz site and associated antenna system for NDOT's existing trailer. NDOT is responsible for the installation of this equipment into their existing trailer.

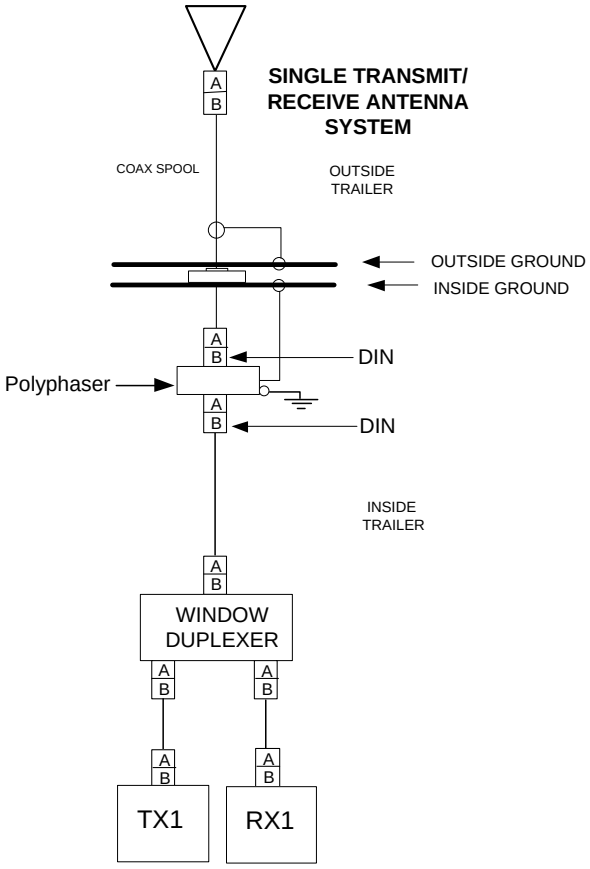
Harris will provide the following equipment:

1. Antenna System
2. Conventional 800 MHz 1 Channel Site

SOW Antenna System

Harris will provide a single antenna for both transmit and receive. The antenna system pictured in Figure 11 below, will connect to the TB9400 base station. Polyphasers will provide lightening protection in combination with a suggested inside and outside ground bar when connected to temporary ground system on location.

Figure 11. Antenna System Configuration



SOW 800 MHz Conventional 1 Channel Site Equipment

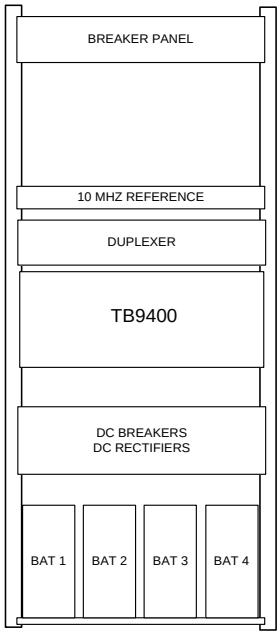
The TB9400 800 MHz conventional station is a 4-rack unit station that has some special requirements for heat transfer and grounding to maintain FCC compliance and certification. The equipment rack will house the following equipment for conventional site operation:

1. TB9400 Base Station
    a. Reciter
    b. Power Amplifier
    c. Power Management Unit (PMU)
2. Power Distribution- consists of:
    a. DC Breaker Panel
    b. Power Block Wiring

SOW 800 MHz Conventional Site Cabinets

The 800 MHz conventional site equipment will be housed in one rack space. The hardware has a footprint of 19 inches wide by 24 inches deep. See Figure 12 below:

Figure 12. P25 Site Cabinets



NDOT is responsible for verifying rack space requirements are met in their trailer.

SOW Equipment Power Requirements

Harris equipment will be powered by rectified AC input with -48V DC output. The equipment planned for the transportable site is listed in Figure 13.

Figure 13. P25 Site Equipment Power Requirements

Equipment	Voltage
Base Stations / Repeaters	-48V DC
TB9400 Base Station	-48V DC
Frequency Reference	-48VDC

SOW -48VDC Plant Power Requirements

Power requirements for Harris equipment are listed in Figure 14. DC power plant is the responsibility of NDOT.

Figure 14. DC Plant Power Requirements

Battery Recharge Time-Hours	24
Battery Run Time-Hours	.5
Battery Amp Hours	4
Battery re-charge Current	.2
Rectifier Size-Load Amps	**8.7**

SOW GENERATOR REQUIREMENTS

The Generator requirements to support the 800 MHz Conventional site equipment are listed in Figure 15:

Figure 15. Generator Requirements

Requirement	Rating
Generator Rating	15KW
Fuel Type	Propane
Voltage Output	120/240
Fuel Supply	80 Gal
Electric Start	12 VDC

NDOT is responsible for providing adequate back-up and or generator equipment.

SOW AIR CONDITIONING REQUIREMENTS

Harris equipment requires 1041 BTUs to cool the radio equipment. Cooling requirements addressed ambient temperature, desired enclosure temperature of 75^{o}F, heat load, and location in direct sunlight

SOW GROUNDING SYSTEM

The grounding system will include interior and exterior ground principles according to the Harris grounding specification for sites. While this a transportable site, proper grounding is extremely important to provide safety for the equipment and any personnel within proximity of the trailer and tower. Temporary grounding posts at the location must be provided once the trailer location is established. All site grounding is the responsibility of NDOT.

Road Weather Information System (RWIS)

Harris will provide NDOT with an XG-75M radio to connect to existing road weather information system at 17 sites. This point-to-point data communication on the Harris P25 VIDA system will require PPP or point-to-point protocol. Site locations are listed in Figure 16. NDOT is responsible for network to radio to RWIS connectivity.

Figure 16. RWIS Sites

Site Name	Site Name
Austin Mtn	Penn Hill
Border Inn	Pilot Peak
Mt Brock	Pinegrove
Cave Mtn	Prospect Peak
Currant Summit	Spruce Mtn
Ellen Dee	Squaw Peak
Hickison	Toulon Peak
Kimberly	Winnemucca
Peavy Hill	

Nevada Dispatch Interconnect Project

Nevada Dispatch Interconnect Project (NDIP) consists of 31 locations across the state of Nevada. Twenty-four locations have existing Interoperability Gateway equipment and older model routers and switches. These sites will be included in this project scope. Harris will reconfigure the current NDIP equipment currently connected to the existing VIDA Core into the new VIDA Core. Harris will provide new switches and redundant routers at 24 locations as identified below:

Douglas County

Carson City

Lyon County

Storey County

Lander County

Mineral County

Pershing County

The following locations are configured on the existing VIDA Core and connected via gateways at the FAST Center in Las Vegas to SNACC.

LVMPD

FAO

Henderson

North Las Vegas

Mesquite

Nellis AFB

Clark County

The following locations are supported by a talkgroup directly connected to existing NSRS/WCRCS core:

Reno

NHP Carson

NHP Elko

NHP Las Vegas

NDOT District I

NDOT District II

NDOT District III

Elko County

Washoe County

Sparks

Harris will perform the following services for each NDIP location:

- New IP scheme on existing equipment
- New configs for existing gateway equipment
- Move talkgroups from current Core to new Core
- Add talkgroups to new Core

Site Equipment

The MASTR V base stations will operate as multicast systems at all radio sites. They will support P25 Phase 1 (FDMA) and P25 Phase 2 (TDMA) trunking operations. All base station equipment and antenna combining equipment will be housed in 84-inch, seismic-Zone-4-rated, open-equipment racks.

Harris will furnish and install new antenna system equipment (antenna, transmission line, transmitter combiners, receiver multicouplers, TTAs, and connectors) for all P25-Trunked RF

sites based on the equipment modeled in the RAPTR RF coverage design tool. Harris will source all RF materials from suppliers, including transmission line of appropriate length. The P25 Site configuration is in the Site Details Attachment, Exhibit 1a.

Solar Sites

Harris will provide low-powered MASTR V base stations at the following sites. These stations will have a maximum transmit power of 20 W. Solar power will be provided by NDOT.

- Buster
- Fitzpatrick
- Irish
- Timber
- Schader

Local Base Stations

Harris will provide 15 location base stations for DPS. These stations will be XG-75M radios operating as backup control stations (CS7000). These control stations will be located over 300 ft from each dispatch position. To control the CS7000 stations, Harris will provide a remote controller (SP721) at each of the 15 dispatch positions, 10 dispatch positions in the south and 5 dispatch positions in the north. Because of the extended distance between the dispatchers and the control stations, the remote controllers will connect to the CS7000 using CAN Bus Extenders. The CAN Bus Extender will convert the copper cable CAN bus to a fiber optic medium. NDOT will provide power to these radio control stations. These control stations will be housed on existing equipment racks provided by NDOT.

- 10 in Southern Nevada (Las Vegas)
- 5 in Northern Nevada (Carson City)

The CS7000 backup control stations will allow dispatchers to continue dispatch operations during a loss of connectivity from the Symphony Dispatch Platform to the VIDA Premier/Connect core switch.

Cross Band Repeater System

The Nevada Cross Band Repeater Network (NCRN) will facilitate interoperability with agencies on different frequency bands. The 34 NDOT NCRN sites will link VHF and 800 MHz Calling and Tactical Channels, (three VHF and three 800 MHz channels per site). Harris will provide TB9400 conventional base stations as the solution to the base station equipment at the existing 25 NDOT sites. The existing VHF antenna system at the 25 sites will also be replaced with new equipment. The 800 MHz NCRN stations will be incorporated into the existing EDACS antenna system infrastructure, once the EDACS site has been decommissioned. For the 9 remaining NDOT NCRN sites, Harris will provide the TB9400 base stations in addition to the necessary VHF combiners, circulators and the antenna system. Seven of the new 800 MHz NCRN channels sites will be integrated with the existing EDACS 800 MHz antenna system, after the EDACS site is decommissioned. The 800 MHz NCRN stations at the Peavine and Poito sites will be integrated into the P25 antenna system equipment. It is assumed the P25 channels at Poito will be 800 MHz. The P25 antenna system at Peavine supports 700 MHz. For the 800 MHz NCRN stations at Peavine to share the 700 MHz P25 system antenna system equipment, a diplexer will be incorporated into the design. Harris will provide one receive antenna.

Three TB9400 VHF stations and three 800 MHz stations will replace the existing MASTR III and Quantar models used today.

Each station will connect to the local network and can be configured to send/receive the audio traffic to another station's IP interface. The conventional base stations and VHF antenna system equipment will reside in open, 84-inch, seismic-Zone-4-rated equipment racks. NDOT Crossband repeater site locations are listed in Figure 17.

The cross-banding is handled via an IP connection. Each station is configured to "route" any audio received to a specific station, that would in turn transmit the audio on its frequency band. Because the NCRN subsystems are collocated with P25 sites, the only piece of network gear required in the NCRN subsystem is a switch. There will be a trunked interface between it and the P25 site router. Harris has included the Encompass Gateway VM, equipped with Digital Fixed Station Interface (DFSI), at the VIDA Core. The application's DFSI protocol operates with VIDA to simultaneously interface with P25 trunked sites, consoles, and DFSI-enabled base

stations. The Encompass Gateway is not a high availability application and will only be installed on the Primary Premier Core residing at NDOT's Las Vegas SANS location.

Neighboring conventional users would need the following equipment to tie into the NSRS P25 system cores.

- Conventional station
- Router
- Switch
- Backhaul connection to VIDA Core

Please note if tone remote control and/or E&M signaling along with MDC-1200 signaling is required, an Interoperability Gateway is required to support this signaling.

Figure 17. NCRN Repeater Site Configuration

Site Name	Status	TB9400 Qty VHF	TB9400 Qty 800 MHz	VHF Antenna System	800 MHz Antenna System
Austin Mountain	Installed	3	3	New	Existing EDACS
Bald Mountain	Installed	3	3	New	Existing EDACS
Cave Mountain	Installed	3	3	New	Existing EDACS
Eagle Ridge	Installed	3	3	New	Existing EDACS
Elko Mountain	Installed	3	3	New	Existing EDACS
Ellen Dee	Installed	3	3	New	Existing EDACS
Fitzpatrick	Installed	3	3	New	Existing EDACS
Highland Peak	Installed	3	3	New	Existing EDACS
Mary's Mountain	Installed	3	3	New	Existing EDACS
Mt. Brock	Installed	3	3	New	Existing EDACS
Peavine	Installed	3	3	New	Existing EDACS
Peavy Hill	Installed	3	3	New	Existing EDACS
Penn Hill	Installed	3	3	New	Existing EDACS
Pilot Peak	Installed	3	3	New	Existing EDACS
Pine Grove	Installed	3	3	New	Existing EDACS
Pinenut Mt./Como	Installed	3	3	New	Existing EDACS
Poito Valley	Installed	3	3	New	Existing EDACS
Prospect Peak	Installed	3	3	New	Existing EDACS
Sober Peak	Installed	3	3	New	Existing EDACS

Site Name	Status	TB9400 Qty VHF	TB9400 Qty 800 MHz	VHF Antenna System	800 MHz Antenna System
Spruce Mtn.	Installed	3	3	New	Existing EDACS
Squaw Peak	Installed	3	3	New	Existing EDACS
Toulon Peak	Installed	3	3	New	Existing EDACS
TV Hill	Installed	3	3	New	Existing EDACS
Warm Springs	Installed	3	3	New	Existing EDACS
Winnemucca	Installed	3	3	New	Existing EDACS
3-Mile	Future	3	3	New	Existing EDACS
Argenta	Future	3	3	New	Existing EDACS
Caliente	Future	3	3	New	Existing EDACS
Currant	Future	3	3	New	Existing EDACS
Fairview	Future	3	3	New	Existing EDACS
Mesquite	Future	3	3	New	Existing EDACS
Moses	Future	3	3	New	Existing EDACS
Overton	Future	3	3	New	Existing EDACS
Trident Peak	Future	3	3	New	Existing EDACS

Network Management Systems

Harris will provide a solid Unified Network Management System (UNMS) that enables monitoring, control and configuration of P25 trunked and conventional communication systems with high availability and performance. The Network Sentry (NWS) will monitor and alert the status of trunked site equipment and facilities to the Regional Network Manager (RNM). The RNM will monitor network utilization, performance, health, consolidates the region wide alarm information and report it to the Enterprise Network Manager (ENM). The ENM and other applications in the UNMS suite will provide a comprehensive system solution. The UNMS will host the following applications on Virtual Access Server(VAS) located on the VIDA Premier Core:

- Enterprise Network Manager (ENM)
- Unified Administrative System (UAS)
- Activity Warehouse

Harris will provide each Premier and Connect core with a Device Manager license for its RSM Pro. The entire NSRS system includes 6 Device Managers. NDOT will be able to remote into the RSM pro to run Device Manager.

Unified Network Management System
The ENM and UAS web interfaces will support 50 concurrent sessions across the network and will be protected by role-based authentication defined on the Microsoft Active Directory server. Network monitoring applications support SNMP V2c and V3 for secured communications.
The following applications are available on a per user license basis:

- Radio Personality Manager 2 (RPM2)
- Profile Manager

Harris will provide NDOT 4 each of these licenses.

Figure 18. List of Requested Features and Harris' Offerings

Requirement	Harris Offering
Monitor health, keep alive, failures of all network devices. Generate statistical reports, interrogate,	Enterprise Network Manager (ENM)

Requirement	Harris Offering
troubleshoot and maintain network components, send control commands, optimize performance.	
Paging and email notifications.	ENM / Regional Network Manager (RNM)
Configure components, backup and restore configuration remotely.	Device Manager & Console(DMC) and Radio Personality Manager 2 (RPM2)
Push updates to remote equipment and upgrade if necessary	DMC
Manage encryption capabilities and over-the-air features	Unified Administrative System (UAS)
Manage intersystem interoperability	ISSI
Local administration database	UAS
Real-time airtime usage, site affiliations	Activity Warehouse, RNM
Real-time monitoring of network usage, network elements, GPS system, external interface detection	ENM/ RNM

Network Management Terminal (NMT)

Harris will provide 10 Network Management Terminals (NMT). Network connections will be provided by NDOT at the time of installation.

1. NDOT – 10
    a. Las Vegas – 2 at NDOT yard
    b. Reno – 2 at NDOT yard
    c. Elko – 2 at NDOT yard
    d. NDOT HQ – 4 in Carson City

Each NMT will be comprised of a PC running Windows OS, a monitor, keyboard and mouse. The NMT is configured to operate on the local network at the specified location. Each terminal will be attached to the Active Directory domain with the proper machine credentials and varying

levels of operator privileges. The NMTs will have necessary licenses and permissions to access the entire suite of management applications.

Network Management Systems – Asset Management

NDOT will use its existing Mobile Management System (MMS) asset management system. No push-pull integration will be available with the VIDA P25 radio system using MMS. NDOT will be provided with an Excel printout from the P25 system that NDOT will use to manually enter assets into the asset management system.

Remote Terminal Unit (RTU)

Harris VIDA Network Sentry(**NWS**) hosts site management services for controlling, managing and reporting site alarms and faults to the Regional Network Manager (RNM) and other external management systems via SNMP. Site network devices such as routers and switches report status information to the RNM providing an overall picture of the network. NWS downloads, maintains and distributes the database provisions to the site devices; archives and reports site call activity to the Regional Site Manager (RSM). The NWS is fully compatible with NMT and NMS, presenting a detailed snapshot of monitored devices, enabling technicians to make quick decisions.

The NWS is equipped with an array of digital Inputs, (expandable to 256 with additional hardware), digital outputs and analog inputs. These I/O (input/output) points can be configured to monitor various non-P25 devices such as RF Sensors, temperature alarms, doors, tower beacons, antenna systems, etc. The cross-connect panel is at the back of the rack with punch-blocks simplifying installation, testing and maintenance for the operators. It synchronizes time with system domain clock through AD policies. NWS' at every site create a flexible work environment and help improve efficiency and productivity.

VIDA Network WAN Requirements

To guarantee the quality of voice through the VIDA network, all WAN links supported by NDOT provided microwave and fiber backhaul will need to strictly adhere to the requirements provided in the following sections. Conformance with these design requirements is a necessary condition for Harris to meet the overall performance needs of the VIDA system and provide a guaranteed

level of service for voice quality. Failure to adhere to these requirements could result in poor audio for which Harris cannot be held accountable. In the event of audio problems, Harris will work with NDOT to determine the source of the problem. If the problem is determined to be in the NDOT supplied backhaul, Harris will be available on a contract basis to help resolve the issue.

Packet Loss Requirements

Due to the connectionless nature of UDP used in transmitting voice packets, minimal packet loss is tolerable in the VIDA network. However, *any* packet loss could result in degraded voice quality or loss of voice. Harris will not be held responsible for degraded voice quality that comes from the result of packet loss in the NDOT provided transport network.
To assure voice quality over the backhaul network, Harris recommends NDOT to conduct performance testing measurements based on the following:

- RFC 2544 standard to be used
- Length of test per link shall be 12hrs
- Frame loss shall be less than .01%
- Out-of-Order packets shall be less than .01%

Multi-Site Jitter (One-way)

Jitter is the variability of packet delays within the same voice packet stream (talk spurt). The requirement is for the overall jitter to average to zero and to never build up to more than 60 msec one-way. Any streams with excessive jitter will be considered to have packet loss and will cause voice quality issues.

For example, if a voice packet were 60 milliseconds late, then it would be optimal for the next few voice packets to be early to get the average jitter back to zero. This will allow the voice buffer to build back to a stable point.

For allowable Simulcast Jitter, refer to the IP Simulcast Latency and Jitter section.

Latency Requirements (One-way)

Some degree of latency, such as satellite links, can be supported within the VIDA network. Any latency within the system will need to stay constant to avoid jitter. Latency requirements differ

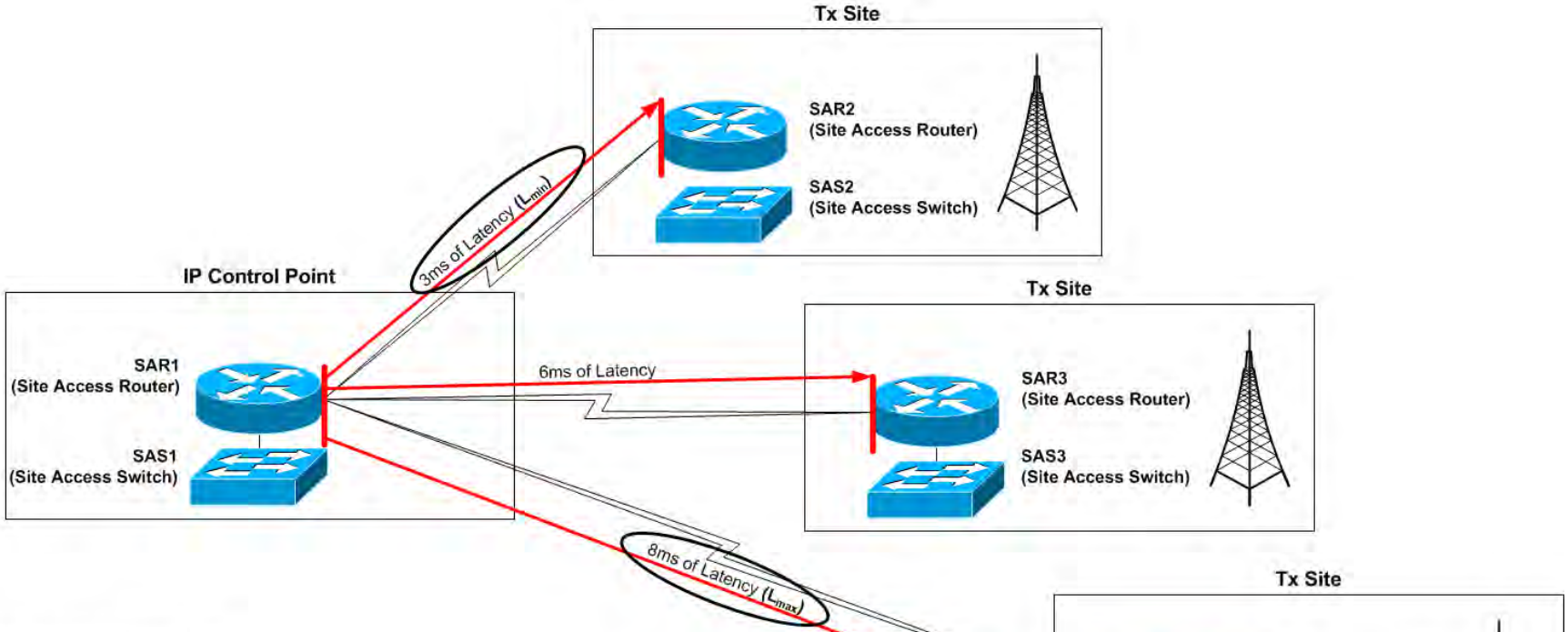
based on the site type and traffic patterns. This section defines latency requirements for Multisite to Premier/Connect Core, Core to Core, Simulcast Site to Control Point, and Control Point to Core.

Latency is measured one-way. Asymmetric latency is permitted if one-way measurements meet specifications below. Satellite links can be supported after system timers are modified to account for satellite delay.

- VIDA Premier/Connect Core Latency
  - Core to Core latency must be less than (150ms)
- Multisite Latency
  - Multisite to Core latency must be less than (150ms - Core Latency)
- Simulcast Latency
  - Simulcast Tx/Rx site to Control Point
  - Refer to the diagram and instruction in IP Simulcast Latency and Jitter section
  - Latency must be less than (35ms)
- Control Point Latency
  - Control Point to Core latency must be less than (150ms - Simulcast Latencymax - Core Latency).

Distributed Control Point and IP Simulcast

Latency and jitter requirements for DCP/IP Simulcast, Linear and Conventional Simulcast and Voted Systems.



IP Simulcast Latency and Jitter

Due to the time sensitive nature of IP Simulcast, Linear Simulcast, and Conventional Simulcast and Voting, they have strict timing requirements for their backhaul networks. These types of systems share the following WAN requirements, specifically for the control point to transmit site or from voter to conventional channel.

1. Maximum one-way network delay (latency+ jitter) between the control point and any transmit/receive site must be less than 35ms.
2. Use the following formula to determine the overall one-way jitter requirement from the control point to the transmit site, and vice versa.
   a. Latency of furthest transmit site to control point = L_{max}
   b. Latency of closest transmit site to control point = L_{min}
   c. Maximum one-way jitter < [35 ms - (L_{max} – L_{min})]

In this example: **35ms – (8ms – 3ms) = 30ms or less of jitter is allowable**

Microwave Physical Requirements

All physical interfaces will only be copper Ethernet at either 100Mbps/full duplex no-negotiation or 1Gbps/full duplex

Microwave Service Requirements

- The layer two or three services should support 1500-byte IP packets.
- Each site should have a single layer two or three service that connects to both VIDA Premier/Connect Core locations (primary and secondary locations)
- Each primary and secondary VIDA Premier/Connect Core should be connected via a layer two or three service to provide redundant connectivity between the two core locations.
- All services should be guaranteed for the total bandwidth as required in the contract.
- At no time should these services have less bandwidth available than required.
- Any loop switching should occur in less than 1 second and should be seamless to all LMR routers and should only occur in reaction to a route failure or manual initiation.
- All services should be configured to be non-revertive so that when a failure occurs, the service stays on the particular failover path and does not revert back to the primary path until another failure occurs
- All services will be constantly monitored using IPSLA to meet the WAN requirements found in this section.

Layer 2 Quality of Service Requirements

If Layer 2 WAN services are being provided, the layer 2 WAN should map our layer 3 DSCP markings into the appropriate layer 2 queues that meet the layer 3 requirements.

Layer 3 Quality of Service Requirements

At OSI Layer 3, the network will recognize and forward Harris voice traffic marked using the Differentiated Services Code Point (DSCP) byte and the network will also meet the following requirements:

1. The Platinum (DSCP EF) queue should be treated as a strict priority queue for voice.
2. All other queues should be treated as CBWFQ.
3. All DSCP values should not be manipulated during transport.

Figure 19. Table 1 - QOS Level Summarization

Level	DSCP Marking	Bandwidth Reservation	Queuing Method	IP Services
Platinum Plus	CS6	5%	Class Based Weighted Fair Queue	• EIGRP Traffic
Platinum	EF	50%	Priority Class Based Weighted Fair Queue	• VNIC Voice Traffic • VNIC Management Traffic
Multicast	AF42	15%	Class Based Weighted Fair Queue	• Site Multicast Traffic (Heartbeat)
Gold	AF41	10%	Class Based Weighted Fair Queue	• HA Synchronization Traffic • P25 Data (OTAP, OTAR, …)
Silver	AF31	10%	Class Based Weighted Fair Queue	• RNM ICMP Traffic • Windows Remote Desktop (RDC) • Secure Shell (SSH)
Bronze	AF11	5%	Class Based Weighted Fair Queue	• SNMP Management Traffic • SysLog • ICMP
Best Effort (Default)	BE (0)	None	None	• All Else

Bandwidth Requirements

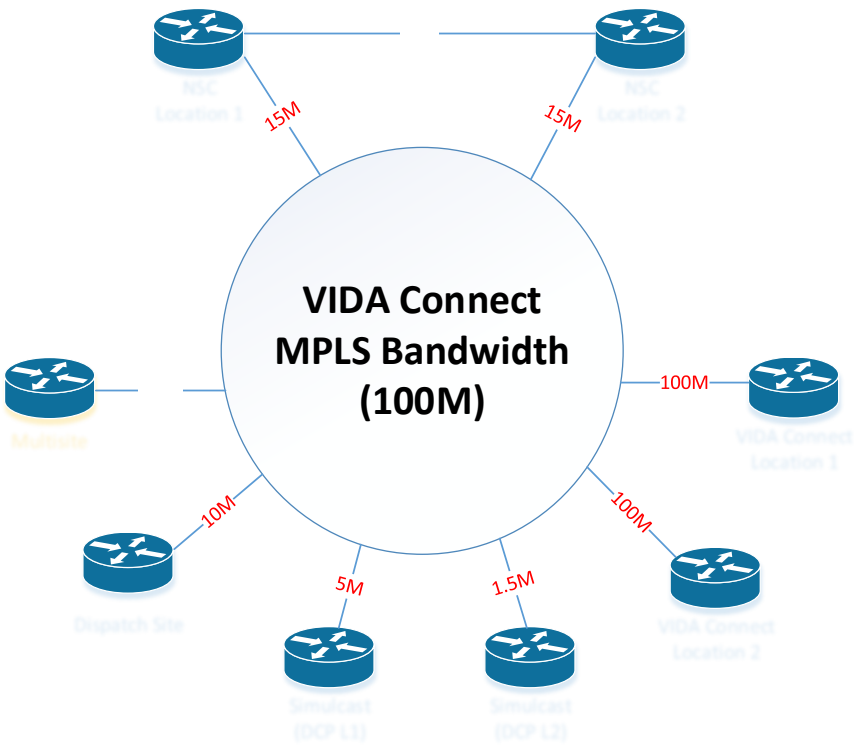
All links that are provided by NDOT will need to meet or exceed the bandwidth requirements established by Harris.

The following bandwidth notes apply to the VIDA Premier and VIDA Connect Cores, RF sites and Console sites over the NDOT and Washoe provided backhaul:

1. Primary and secondary VIDA Premier Cores require a minimum of 50 Mbps. This would mean that the backhaul link between the primary and secondary Premier Core would have a requirement to support 50 Mbps plus any other aggregation of bandwidth that include sites, console locations and VIDA Connect core connections to the VIDA Premier Core. Harris will require a final review of the backhaul topology to finalize overall bandwidth requirements.
2. The dispatch sites require a minimum of 10 Mbps connection to the VIDA Connect Cores. If the Dispatch site / consoles are co-located at the cores, this requirement is irrelevant. This requirement does not include bandwidth for logging recorders. Harris assumes 83 kbps per logging recorder talk-path in addition to 10M for console sites.
3. Primary and secondary VIDA Connect Locations require a minimum of 100 Mbps between each other. This would mean that the backhaul link used for the primary and secondary VIDA Connect locations would have a requirement to support 100 Mbps plus any other bandwidth outside of the VIDA Connect region.
4. The link bandwidth between the VIDA Connect to the VIDA Premier Core require a minimum of 15 Mbps to allow for intra-regional communications between VIDA Connect North and South regions.
5. Minimum multisite link bandwidth to the microwave network is 1.5 Mbps.
6. Minimum simulcast distributive control point (DCP) layer 1 site link bandwidth to the microwave network is 5 Mbps.
7. Minimum simulcast layer 2 transmits site link bandwidth is 1.5 Mbps.

Bandwidth requirements are pictured in Figure 20.

Figure 20. NSRS Bandwidth Requirements



Dispatch Console System

The Symphony Console will consist of two components, the Symphony Dispatch Platform (SDP) and the Symphony application. The SDP is a Windows 10, Intel i7-based industrial grade computer with an integrated custom audio processor that supports 24-hour dispatch operations.

Dispatch Equipment

SYMPHONY DISPATCH PLATFORM

Figure 21 shows the main hardware component of Symphony. The SDP is fully IP-based and connects directly to the redundant radio network core using redundant Ethernet interfaces.

Figure 21. Symphony Dispatch Platform

The NDOT console design includes 29 Symphony consoles at locations across the State of Nevada as listed below. Nine of the Symphony consoles will be new. Harris will upgrade 20 existing Symphony consoles to Windows 10. Figure 22 lists Symphony console locations.

Figure 22. Dispatch Locations

Location	Total Positions	Existing Symphony Consoles Upgrade to Windows 10	New Symphony Consoles required	Core Assignment
FAST Center	13	1 +10	2	South
Elko	2	2	0	North
Elko Radio Shop	1	0	1	North
Reno	2	2	0	North
Reno Radio Shop	1	0	1	North
NHP Carson EOC	5	5	0	North
Washington Yard	1	0	1	South
Carson City Hot Springs	1	0	1	North
LCB	1	0	1	North
Tonopah Radio Shop	1	0	1	South

Location	Total Positions	Existing Symphony Consoles Upgrade to Windows 10	New Symphony Consoles required	Core Assignment
Winnemucca Radio Shop	1	0	1	North

Each new dispatch console will include the following:

- Symphony Dispatch Platform (SDP) - Premier Bundle. This includes a local screen and baton, 8 patch activations, 16 patch definitions, 16 simulselect definitions, I-calls, four user setups, 16 workspace tabs, 12 flexpaths, and a remote Baton.
- Integrated Instant Recall Recorder for playback independent of the logging recorder
- Call Director telephone Interface
- AES-256 Encryption and DES-64 Encryption
- Conventional Controls
- Marker Tone
- 8 SIP telephone lines
- 2 speakers
- 21.5” full HD monitor (other monitor options available)
- 104-key keyboard
- Standard mouse
- Two single heavy-duty footswitch (Operator and Supervisor)
- Standard desk microphone
- Two headsets (Operator and Supervisor)
- Two headset jack boxes with adapters (Operator and Supervisor)
- UPS

Figure 23. Typical Symphony Console Position

Each dispatch location has redundant routers and redundant network interface cards (NICs).

Voice Logging Recorder and Interface

Overview

Harris will provide NDOT with two Exacom, Hindsight-600, IP-based, P25-compatible logging recorders to record all trunked radio traffic, all conventional radio traffic, all 911 trunks, and call taker administrative calls. The Hindsight-600 will provide archival and instant recall recording for Harris' VIDA P25 trunked radio system. It will capture and store IP audio and call-related metadata reliably for easy retrieval. The recordings will be instantly available for replay, research, incident reconstruction, burn to CD/Blu-ray, and export.

Voice Logging Recorder Equipment

The NDOT logging recorder solution is at the FAST Center, where it is co-located with the VIDA Premier/Connect South Core. It is based on (2) redundant 328 channel recording servers (Dell T-640), each with 296 IP channels for Harris P25 audio and data, 8 analog channels, 24 VoIP channels for Avaya phones and 3 TB of storage that is RAID 5. The servers will simultaneously record all Harris P25 vocoded communications. Once these recordings have been captured by the redundant recorders, the recordings will be stored in the core location recording servers as well as be made available for the Access Server that provide NDOT the ability to search,

playback and save P25 audio and data. The Access server will assist with incident recreation and playback of radio calls and phone calls to be combined for complete incident recreation. It is important to note that radio recording access will be administered and governed by the local system administrator and users will have permissions and access provided by the system administrator.

The DPS logging recorder solution is at the FAST Center, where it is co-located with the VIDA Premier/Connect South Core. It is based on (2) redundant 120 channel recording servers (Dell T-640), each with 72 IP channels for Harris P25 audio and data, 32 analog channels, 16 VoIP channels for Avaya phones and 3 TB of storage that is RAID 5. The servers will simultaneously record all Harris P25 vocoded communications. Once these recordings have been captured by the redundant recorders, the recordings will be stored in the core location recording servers as well as be made available for the Access Server that provide DPS the ability to search, playback and save P25 audio and data. The Access server will assist with incident recreation and playback of radio calls and phone calls to be combined for complete incident recreation. It is important to note that radio recording access will be administered and governed by the local system administrator and users will have permissions and access provided by the system administrator.

The Hindsight-600 is EIA/TIA 19” rack-mountable. It will meet or exceed all FCC, IEEE, EIA/TIA, NENA, and APCO standards. All sites feature a NAS device for backup storage for each of the recording servers. All sites have client licenses associated with the Access Server.

Equipment Reuse

NDOT has many existing assets. The following existing asset licenses will be transferred to the new Core.

- Existing Symphony console & talkpath licenses will be transferred to the new Core.
- Existing BeOn client licenses will be transferred to the new Core.
- Existing Interoperability Gateways and associated licenses will be transferred to the new Core

Subscriber Equipment

User Radio Equipment

All radios will be software-programmable and configurable to match the mission, needs, and budget of each user agency. The XL radios will come equipped with Wi-Fi as a standard feature, with an option for LTE operation. The radios will include EDACS ProVoice to support the phased migration and interoperability with the existing terminals that NDOT uses today. Many of the existing models, like the XG-series mobiles and portables, will continue to be compatible with the new P25 system and are P25 Phase 2 upgradeable. All Harris portable and legacy mobile radios are certified to meet FCC PART 90 and environmentally tested to MIL-STD 810G.

Harris will provide mobiles, portables, and base station radio models as identified below and in Exhibit 6 SOW Price Schedule. The Price Schedule supersedes the radio information in the 'FY18 State agency Replacement Upgrade Sheets' Excel file provided by NDOT. Upgrading existing radios is not included under this contract.

- XG-75M Control Stations
- XL-185P
- XL-200P
- XG-25P
- XG-25M
- XG-75M
- XL-200M

Desktop Remote Control Unit

Harris will provide NDOT 59 SP721 Desktop Controller to connect to the CS7000 control stations/base stations installed in remote locations. The SP721 will provide remote access for voice, data and control of the CS7000 control station/base station. The SP721 will have a desktop microphone, and an integrated 3W speaker. The CS7000 can be placed up to 250 ft from the SP721.

Spare Equipment

Spare equipment housed locally by NDOT will be used to quickly replace failed equipment. As instructed by NDOT, Harris will provide five, 5 channel sites as spares and quantity 6 each of the NCRN VHF, 800 MHz stations and 6 receiver multicouplers and preselector filters. A detailed list of equipment can be found in Exhibit 5 Equipment List SOW. Spare equipment includes the following:

- Five, 5 channel MASTR V sites
- Five sites of routing equipment
- Five sites of transmit and receive antenna system equipment
  - Antennas
  - Combiners
  - Receiver Multicoupler
  - Tower top Amps
- Six VHF TB9400 stations
- Six 800 MHz TB9400 stations
- Six VHF Preselector filters
- Six 800 MHz Receiver multicouplers (Using existing EDACS antenna system)

Harris is adding the following items to NDOT's list of spares.

- VIDA Premier Core Server
- VIDA Premier/Connect Core Server
- Two console site routers and switch equipment
- Three Interoperability Gateway interface cards (12 interfaces)
- One Interoperability Gateway power supply

NSRS Sites by Entity

127 Sites, 101 Existing sites, 26 New Candidate sites (3 sites are being constructed by NDOT)
56 Sites - Region 1
38 Sites - Region 2
33 Sites - Region 3

	Member	Region	Core Assignment North or South	COUNTY	SITE NAME	STATE	CHS. P25 Phase 1 *Virtual Site	SITE TYPE
WASHOE COUNTY **2nd Half of VIDA Premier Core - Washoe NOC** **VIDA Premier/Connect HA #2A -Washoe NOC** ***Note: NVE owns other half of VIDA Premier/Connect HA***								
1	WC	2	North	Washoe	Fox WCRCS	NV	5	Multi-site
2	WC	2	North	Washoe	Poito - WC	NV	6	Multi-site
3	WC	2	North	Washoe	Tahoe SC - Biltmore	NV	8	Simulcast Cell #1
4	WC	2	North	Washoe	Tahoe SC - Snowflake	NV	8	Simulcast Cell #1
5	WC	2	North	Washoe	Slide WCRCS	NV	12	Simulcast Cell #4
6	WC	2	North	Washoe	Rose WCRCS	NV	12	Simulcast Cell #4
7	WC	2	North	Washoe	Red Peak - Metro SC	NV	16	Simulcast Cell #3
8	WC	2	North	Washoe	Peavine - Metro SC	NV	16	Simulcast Cell #3
	NVE	2	North	Washoe	Chimney (NVE owned site)	NV	16	Simulcast Cell #3
9	WC	2	North	Washoe	Virginia Peak WCRCS	NV	10	Simulcast Cell #5
10	WC	2	North	Washoe	Marble Bluff WCRCS	NV	10	Simulcast Cell #5
11	WC	2	North	Washoe	New Site - Yellow Peak	NV	4	Multi-site
12	WC	2	North	Washoe	New Site - Smokey Quartz	NV	12	Multi-site
13	WC	2	North	Washoe	New Site - Red Rock	NV	4	Multi-site
14	WC	2	North	Washoe	New Site - 49 Mtn	NV	3	Multi-site
15	WC	2	North	Washoe	New Site - Truckee Station 18	NV	8	Multi-site
						TOTAL CHS	150	P25
							6	NCRN (800 MHz)
							156	Phase 1

SITE NAME	TX Antennas	TX Antenna Height	Combiner Size	Additional Equipment at site	Receiver Multicoupler Size	Rx Antenna Height	# of Racks	Latitude	Longitude	Site Elevation (ft)	Combiner	Combiner Channels
Fox WCRCS	1	35 ft	6 Ch Combiner	**Existing one 800 MHz conventional channel included in P25 antenna system.** Assumption is this site will be 800 MHz.	8 ports	50ft	3	41.025531	-119.558219	8163	DSCC75	5
Poito - WC	1	55 ft	10 Ch Combiner	**Existing Cross band repeaters - 3 VHF, 3-800 MHz, 800 MHz included in P25 antenna system.** Assumption is this site will be 800 MHz.	16 ports	70 ft	4+2	40.425989	-119.351661	5686	DSCC75	10
Tahoe SC - Biltmore	1	45 ft	8 Ch Combiner		8 ports	45 ft	3	39.227767	-120.004597	6405	DSCC75	8
Tahoe SC - Snowflake	1	55 ft	10 Ch Combiner	**Existing two 800 MHz conventional channel included in P25 antenna system.** Assumption is this site will be 800 MHz.	16 ports	55ft	3	39.247406	-119.922131	7431	DSCC75	8
Slide WCRCS	2	105 ft	2, 6 Ch Combiners		16 ports	120 ft	4	39.314558	-119.8842	9581	DSCC75	6
Rose WCRCS	2	65 ft	2, 7 Ch Combiners	**Existing single 800 MHz conventional channel included in P25 antenna system.** Assumption is this site will be 800 MHz.	16 ports	75ft	4	39.32325	-119.944194	10135	DSCC75	6
Red Peak - Metro SC	2	135ft	2, 10 Ch Combiners		24ports	150 ft	4	39.5837	-119.798925	5420	DSCC75	10
Peavine - Metro SC	2	85 ft	2, 10 Ch Combiners 1, 6 Ch Combiner, 800 MHz	**Existing Cross band repeaters - 3 VHF, 3-800 MHz, 3-800MHz conventional channels.** A diplexer will combine the 800 MHz frequencies into existing 700 MHz P25 antenna system.	24 ports	100 ft	4+2	39.589583	-119.928328	8209	DSCC75	10
Chimney (NVE owned site)	1	35 ft	2, 10 Ch Combiner		24 ports	50 ft	4					
Virginia Peak WCRCS	1	115 ft	10 Ch Combiner		16 ports	130 ft	4	39.755469	-119.463	8252	DSCC75	10
Marble Bluff WCRCS	1	115 ft	10 Ch Combiner		16 ports	132 ft	4	39.874086	-119.382858	4511	DSCC75	10
New Site - Yellow Peak	1	80 ft	4 Ch Combiner		8 ports	100 ft	3	41.835939	-119.624978	7139	DSCC75	4
New Site - Smokey Quartz	1	80 ft	2, 6 Ch Combiners		16 ports	100 ft	4	39.591667	-119.683056	5128	DSCC75	6
New Site - Red Rock	1	80 ft	4 Ch Combiner		8 ports	100 ft	3	39.906558	-119.945556	5200	DSCC75	4
New Site - 49 Mtn	1	80 ft	4 Ch Combiner		8 ports	100 ft	3	41.552036	-119.934678	7517	DSCC75	4
New Site - Truckee Station 18	1	80 ft	8 Ch Combiner		8 ports	100 ft	3	39.677925	-119.980242	5043	DSCC75	8

SITE NAME	Tx Ant Ht (ft)	Tx Ant Model	Tx Ant Gain (dBd)	Multicoupler	Tower Top Amp	Rx Ant Ht (ft)	Rx Ant Model	Rx Ant Gain(dBd)	Rx Ant Gain (dBd Hzn)
Fox WCRCS	35	SC479-HF1LDF(E5608)(D02)	9	CP00921-6MHzAC	CP00732	50	SC412-HF2LDF(D01-E5608)	11.4	9.9
Poito - WC	55	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	70	SC412-HF2LDF(E5608)	11.4	11.4
Tahoe SC - Biltmore	45	SC432D-HF6LDF(D00-I40-G06)	6	CP00921-6MHzAC	CP00732	45	SC432D-HF6LDF(D00-I40-G06)	6	6
Tahoe SC - Snowflake	55	SC432D-HF6LDF(D00-I40-G06)	6	CP00921-6MHzAC	CP00732	55	SC432D-HF6LDF(D00-I40-G06)	6	6
Slide WCRCS	105	DS7C10F36U3N Vertical	9.9	CP00921-6MHzAC	CP00732	120	DS7C10F36U3N Vertical	9.9	5.1
Rose WCRCS	65	SE419-SWBPALDF(D08-E6461)_130D	9.9	CP00921-6MHzAC	CP00732	75	SE419-SWBPALDF(D08-E6461)_130D	9.9	5.1
Red Peak - Metro SC	135	DS7A06F36U3N	6.5	CP00921-6MHzAC	CP00732	150	SC479-HF1LDF(E5608)(D02)	9	7.8
Peavine - Metro SC	85	SC479-HF1LDF(E5608)(D02)	9	CP00921-6MHzAC	CP00732	100	SC412-HF2LDF(D01-E5608)	11.4	9.9
Chimney (NVE owned site)									
Virginia Peak WCRCS	115	DS7A06F36U3N	6.5	CP00921-6MHzAC	CP00732	130	DS7C10F36U-N	10	10
Marble Bluff WCRCS	115	DS7A08F36U-N	8	CP00921-6MHzAC	CP00732	132	DS7C10F36U-N	10	10
New Site - Yellow Peak	80	DS7C10F36U3N Vertical	9.9	CP00921-6MHzAC	CP00732	100	DS7C10F36U3N Vertical	9.9	5.1
New Site - Smokey Quartz	80	DS7C10F36U3N Vertical	9.9	CP00921-6MHzAC	CP00732	100	SC412-HF2LDF(D01-E5608)	11.4	9.9
New Site - Red Rock	80	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	100	SC412-HF2LDF(E5608)	11.4	11.4
New Site - 49 Mtn	80	DS7A06F36U6N	6	CP00921-6MHzAC	CP00732	100	SC479-HF1LDF(D02-E5608)	9	7.8
New Site - Truckee Station 18	80	DS7A08F36U-N	8	CP00921-6MHzAC	CP00732	100	DS7C10F36U-N	10	10

	Member	Region	Core Assignment North or South	COUNTY	SITE NAME	STATE	CHS. P25 Phase 1 *Virtual Site	SITE TYPE
NDOT **VIDA Premier HA Primary - Las Vegas SANS** **Primary VIDA Premier/Connect HA #1A - FAST Center, Las Vegas, Clark Co** **Secondary VIDA Premier/Connect #1B - Beltway, Las Vegas, Clark Co**								
1	**NDOT**	**3**	**North**	Elko	3-Mile	NV	5	Multi-site
2	**NDOT**	**1**	**South**	Lincoln	Alamo	NV	4	Multi-site
3	**NDOT**	**1**	**South**	Nye	Amargosa Valley	NV	4	Multi-site
4	**NDOT**	**3**	**North**	Lander	Austin	NV	4	Multi-site
5	**NDOT**	**2**	**North**	Mineral	Bald West	NV	5	Multi-site
6	**NDOT**	**3**	**North**	White Pine	Border Inn	NV	4	Multi-site
7	**NDOT**	**1**	**South**	Nye	Brock	NV	7	Multi-site
8	**NDOT**	**3**	**North**	White Pine	Buster	NV	4	Multi-site
9	**NDOT**	**1**	**South**	Lincoln	Caliente	NV	4	Multi-site
10	**NDOT**	**3**	**North**	White Pine	Cave	NV	5	Multi-site
11	**NDOT**	**1**	**South**	Clark	Coyote Springs	NV	**6**	Multi-site
12	**NDOT**	**1**	**South**	Nye	Currant Summit	NV	4	Multi-site
13	**NDOT**	**2**	**North**	Lyon	Eagle Ridge	NV	7	Multi-site
14	**NDOT**	**3**	**North**	Elko	Elko Mtn	NV	8	Multi-site
15	**NDOT**	**3**	**North**	Elko	Ellen Dee	NV	5	Multi-site
16	**NDOT**	**3**	**North**	Eureka	Emigrant	NV	4	Multi-site
17	**NDOT**	**2**	**North**	Churchill	Fairview Peak	NV	5	Multi-site
18	**NDOT**	**1**	**South**	Nye	Fitzpatrick	NV	4	Multi-site
19	**NDOT**	**3**	**North**	Humboldt	Flatcreek	NV	4	Multi-site
20	**NDOT**	**3**	**North**	Humboldt	Golconda	NV	**6**	Multi-site
21	**NDOT**	**3**	**North**	Elko	HD Summit	NV	4	Multi-site
22	**NDOT**	**3**	**North**	Lander	Hickison	NV	4	Multi-site

SITE NAME	TX Antennas	TX Antenna Height	Combiner Size	Additional Equipment at site	Receiver Multicoupler Size	Rx Antenna Height	# of Racks	Latitude	Longitude	Site Elevation (ft)	Combiner	Combiner Channels
3-Mile	1	25 ft	5 Ch Combiner	Future Cross band repeaters - 3 VHF, 3-800 MHz (not included in P25 antenna system)	8 ports	45 ft	2+2	40.748497	-114.098858	5086	DSCC75	5
Alamo	1	40 ft	4 Ch Combiner		8 ports	60 ft	2	37.344111	-115.257333	6158	DSCC75	4
Amargosa Valley	1	140 ft	4 Ch Combiner		8 ports	160 ft	2	36.540778	-116.437	2375	DSCC75	4
Austin	1	5 ft	4 Ch Combiner	**Existing Cross band repeaters - 3 VHF, 3-800 MHz (not included in P25 antenna system) RWIS**	8 ports	20 ft	2+2	39.453475	-117.054322	8432	DSCC75	4
Bald West	1	30 ft	5 Ch Combiner	**Existing Cross band repeaters - 3 VHF, 3-800 MHz (not included in P25antenna system)**	8 ports	50 ft	2+2	38.784447	-118.834381	9177	DSCC75	5
Border Inn	1	20 ft	4 Ch Combiner	**RWIS**	8 ports	40 ft	2	39.055372	-114.050758	5122	DSCC75	4
Brock	1	70 ft	7 Ch Combiner	**RWIS**	8 ports	90 ft	2	38.051678	-117.225983	7054	DSCC75	7
Buster	1	20 ft	4 Ch Combiner		8 ports	40 ft	2	39.368697	-115.470628	8337	DSCC75	4
Caliente	1	100 ft	4 Ch Combiner	Future Cross band repeaters - 3 VHF, 3-800 MHz (not included in P25antenna system)	8 ports	120 ft	2+2	37.600694	-114.509806	5171	DSCC75	4
Cave	1	45 ft	5 Ch Combiner	**Existing Cross band repeaters - 3 VHF, 3-800 MHz (not included in P25 antenna system) RWIS**	8 ports	65 ft	2+2	39.160817	-114.614942	10696	DSCC75	5
Coyote Springs	1	60 ft	6 Ch Combiner		8 ports	80 ft	2	36.810817	-114.956433	2644	DSCC75	6
Currant Summit	1	35 ft	4 Ch Combiner	Future Cross band repeaters - 3 VHF, 3-800 MHz (not included in P25 antenna system) RWIS	8 ports	55 ft	2+2	38.830264	-115.294475	7609	DSCC75	4
Eagle Ridge	1	40 ft	7 Ch Combiner	**Existing Cross band repeaters - 3 VHF, 3-800 MHz (not included in P25 antenna system)**	8 ports	60 ft	2+2	39.487764	-119.297569	6851	DSCC75	7
Elko Mtn	1	30 ft	8 Ch Combiner	**Existing Cross band repeaters - 3 VHF, 3-800 MHz (not included in P25 antenna system)**	8 ports	50 ft	2+2	40.894581	-115.630561	7454	DSCC75	8
Ellen Dee	1	40 ft	5 Ch Combiner	**Existing Cross band repeaters - 3 VHF, 3-800 MHz (not included in P25 antenna system) RWIS**	8 ports	60 ft	2+2	41.785017	-114.84045	8583	DSCC75	5
Emigrant	1	40 ft	4 Ch Combiner		8 ports	60 ft	2	40.654767	-116.274161	6149	DSCC75	4
Fairview Peak	1	5 ft	5 Ch Combiner	Future Cross band repeaters - 3 VHF, 3-800 MHz (not included in P25 ant sys)	8 ports	20 ft	2+2	39.225472	-118.152611	8275	DSCC75	5
Fitzpatrick	1	15 ft	4 Ch Combiner	**Existing Cross band repeaters - 3 VHF, 3-800 MHz (not included in P25 ant sys)**	8 ports	25 ft	2+2	38.488678	-117.108606	8399	DSCC75	4
Flatcreek	1	30 ft	4 Ch Combiner		8 ports	50 ft	2	41.728819	-117.719142	4725	DSCC75	4
Golconda	1	100 ft	6 Ch Combiner		8 ports	120 ft	2	40.933475	-117.4002	5348	DSCC75	6
HD Summit	1	40 ft	4 Ch Combiner		8 ports	60 ft	2	41.348025	-114.805589	6280	DSCC75	4
Hickison	1	40 ft	4 Ch Combiner	**RWIS**	8 ports	60 ft	2	39.436514	-116.725531	7080	DSCC75	4

SITE NAME	Tx Ant Ht (ft)	Tx Ant Model	Tx Ant Gain (dBd)	Multicoupler	Tower Top Amp	Rx Ant Ht (ft)	Rx Ant Model	Rx Ant Gain(dBd)	Rx Ant Gain (dBd Hzn)
3-Mile	25	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	45	SC412-HF2LDF(E5608)	11.4	11.4
Alamo	40	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	60	SC412-HF2LDF(E5608)	11.4	11.4
Amargosa Valley	140	DS7A06F36U-N	8	CP00921-6MHzAC	CP00732	160	DS7A06F36U-N	6	6
Austin	5	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	20	SC412-HF2LDF(E5608)	11.4	11.4
Bald West	30	SC473-HF1LDF	3	CP00921-6MHzAC	CP00732	50	SC476-HF1LDF	6.1	6.1
Border Inn	20	DS7A08F36U-N	8	CP00921-6MHzAC	CP00732	40	DS7C10F36U-N	10	10
Brock	70	DS7A06F36U-N	6	CP00921-6MHzAC	CP00732	90	DS7A08F36U-N	8	8
Buster	20	DS7A06F36U-N	8	CP00921-6MHzAC	CP00732	40	DS7A06F36D-N	6	6
Caliente	100	DS7A08F36U-N	8	CP00921-6MHzAC	CP00732	120	DS7C10F36U-N	10	10
Cave	45	DS7A06F36U3N	6.5	CP00921-6MHzAC	CP00732	65	SC479-HF1LDF(D02-E5608)	9	7.8
Coyote Springs	60	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	80	SC412-HF2LDF(E5608)	11.4	11.4
Currant Summit	35	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	55	SC412-HF2LDF(E5608)	11.4	11.4
Eagle Ridge	40	DS7A08F36U-N	8	CP00921-6MHzAC	CP00732	60	DS7C10F36U-N	10	10
Elko Mtn	30	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	50	SC412-HF2LDF(E5608)	11.4	11.4
Ellen Dee	40	DS7A08F36U-N	8	CP00921-6MHzAC	CP00732	60	DS7C10F36U-N	10	10
Emigrant	40	DS7A06F36U-N	6	CP00921-6MHzAC	CP00732	60	DS7A08F36U-N	8	8
Fairview Peak	5	SC473-HF1LDF	3	CP00921-6MHzAC	CP00732	20	DS7A06F36U-N	6	6
Fitzpatrick	15	DS7A08F36U-N	10	CP00921-6MHzAC	CP00732	25	DS7A08F36U-N	8	8
Flatcreek	30	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	50	SC412-HF2LDF(E5608)	11.4	11.4
Golconda	100	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	120	SC412-HF2LDF(E5608)	11.4	11.4
HD Summit	40	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	60	SC412-HF2LDF(E5608)	11.4	11.4
Hickison	40	DS7A08F36U-N	8	CP00921-6MHzAC	CP00732	60	DS7C10F36U-N	10	10

	Member	Region	Core Assignment North or South	COUNTY	SITE NAME	STATE	CHS. P25 Phase 1 *Virtual Site	SITE TYPE
23	**NDOT**	**1**	**South**	Lincoln	Highland Pk	NV	5	Multi-site
24	**NDOT**	**1**	**South**	Clark	Hoover Dam	NV	4	Multi-site
25	**NDOT**	**2**	**North**	Pershing	Imlay	NV	**6**	Multi-site
41	**NDOT**	**1**	**South**	Clark	**New Site - Indian Springs**	NV	4	Multi-site
26	**NDOT**	**1**	**South**	Lincoln	Irish	NV	4	Multi-site
27	**NDOT**	**3**	**North**	~~White Pine~~	Kimberly	NV	5	Multi-site
28	**NDOT**	**2**	**North**	Mineral	Kinkaid	NV	5	Multi-site
29	**NDOT**	**3**	**North**	Elko	Loray	NV	5	Multi-site
30	**NDOT**	**3**	**North**	Eureka	Mary's	NV	7	Multi-site
31	**NDOT**	**1**	**South**	Nye	Mercury	NV	5	Multi-site
32	**NDOT**	**1**	**South**	Clark	Mesquite	NV	**6**	Multi-site
33	**NDOT**	**1**	**South**	Mineral	Millers	NV	4	Multi-site
34	**NDOT**	**1**	**South**	Esmeralda	Montezuma	NV	4	Multi-site
35	**NDOT**	**3**	**North**	Lander	Moses	NV	4	Multi-site
27	**NDOT**	**2**	**North**	Douglas	Muller	NV	**6**	Multi-site
36	**NDOT**	**3**	**North**	Lander	New Pass	NV	4	Multi-site
37	**NDOT**	**1**	**South**	Esmeralda	Palmetto	NV	4	Multi-site
38	**NDOT**	**3**	**North**	Elko	Peavy Hill	NV	**6**	Multi-site
39	**NDOT**	**3**	**North**	Elko	Penn Hill	NV	4	Multi-site
40	**NDOT**	**1**	**South**	Mineral	Pilot Pk	NV	4	Multi-site
41	**NDOT**	**2**	**North**	Lyon	Pinegrove	NV	5	Multi-site
42	**NDOT**	**3**	**North**	Eureka	Prospect Pk	NV	**6**	Multi-site
43	**NDOT**	**1**	**South**	Nye	Ragged Ridge	NV	4	Multi-site
44	**NDOT**	**3**	**North**	Elko	Rocky Pt	NV	**6**	Multi-site
45	**NDOT**	**1**	**South**	Nye	Sawtooth	NV	**6**	Multi-site
46	**NDOT**	**1**	**South**	Nye	Schader	NV	4	Multi-site
47	**NDOT**	**3**	**North**	Elko	Secret Pass	NV	4	Multi-site

SITE NAME	TX Antennas	TX Antenna Height	Combiner Size	Additional Equipment at site	Receiver Multicoupler Size	Rx Antenna Height	# of Racks	Latitude	Longitude	Site Elevation (ft)	Combiner	Combiner Channels
Highland Pk	1	16 ft	5 Ch Combiner	**Existing Cross band repeaters - 3 VHF, 3-800 MHz (not included in P25 antenna system)**	8 ports	36 ft	2+2	37.894306	-114.578931	9348	DSCC75	5
Hoover Dam	1	80 ft	4 Ch Combiner		8 ports	100 ft	2	36.017378	-114.741758	1509	DSCC75	4
Imlay	1	40 ft	6 Ch Combiner		8 ports	60 ft	2	40.715911	-118.229728	5118	DSCC75	6
New Site - Indian Springs	1	40 ft	4 Ch Combiner		8 ports	60 ft	2	36.570831	-115.671389	3163	DSCC75	4
Irish	1	45 ft	4 Ch Combiner		8 ports	65 ft	2	37.644889	-115.401467	8695	DSCC75	4
Kimberly	1	40 ft	5 Ch Combiner	**RWIS**	8 ports	60 ft	2	39.314761	-115.089444	9157	DSCC75	5
Kinkaid	1	40 ft	5 Ch Combiner		8 ports	60 ft	2	38.509519	-118.436006	6470	DSCC75	5
Loray	1	80 ft	5 Ch Combiner		8 ports	100 ft	2	41.1455	-114.287817	5509	DSCC75	5
Mary's	1	20 ft	7 Ch Combiner	**Existing Cross band repeaters - 3 VHF, 3-800 MHz (not included in P25 antenna system)**	8 ports	40 ft	2+2	40.718411	-116.270847	7540	DSCC75	7
Mercury	1	30 ft	5 Ch Combiner		8 ports	50 ft	2	36.632667	-115.978769	4177	DSCC75	5
Mesquite	1	50 ft	6 Ch Combiner	Future Cross band repeaters - 3 VHF, 3-800 MHz (not included in P25 antenna system)	8 ports	80 ft	2+2	36.714381	-114.05655	2812	DSCC75	6
Millers	1	40 ft	4 Ch Combiner		8 ports	60 ft	2	38.041647	-118.1886	7874	DSCC75	4
Montezuma	1	30 ft	4 Ch Combiner		8 ports	50 ft	2	37.700692	-117.384031	7773	DSCC75	4
Moses	1	40 ft	4 Ch Combiner	Future Cross band repeaters - 3 VHF, 3-800 MHz (not included in P25 antenna system)	8 ports	60 ft	2+2	40.193536	-117.410853	8370	DSCC75	4
Muller	1	60 ft	6 Ch Combiner		8 ports	80 ft	2	38.976414	-119.794997	4689	DSCC75	6
New Pass	1	60 ft	4 Ch Combiner		8 ports	80 ft	2	39.564328	-117.481553	6598	DSCC75	4
Palmetto	1	40 ft	4 Ch Combiner		8 ports	60 ft	2	37.462081	-117.574008	8895	DSCC75	4
Peavy Hill	1	40 ft	6 Ch Combiner	**Existing Cross band repeaters - 3 VHF, 3-800 MHz (not included in P25 antenna system)** **RWIS**	16 ports	60 ft	2+2	41.19675	-114.943017	7156	DSCC75	6
Penn Hill	1	40 ft	4 Ch Combiner	**Existing Cross band repeaters - 3 VHF, 3-800 MHz (not included in P25 antenna system)** **RWIS**	8 ports	60 ft	2+2	41.735417	-116.063111	9036	DSCC75	4
Pilot Pk	1	5 ft	4 Ch Combiner	**Existing Cross band repeaters - 3 VHF, 3-800 MHz (not included in P25 antenna system)** **RWIS**	8 ports	25 ft	2+2	38.343039	-117.973389	9115	DSCC75	4
Pinegrove	1	30 ft	5 Ch Combiner	**Existing Cross band repeaters - 3 VHF, 3-800 MHz (not included in P25 antenna system)** **RWIS**	8 ports	50 ft	2+2	38.685472	-119.185083	8206	DSCC75	5
Prospect Pk	1	40 ft	6 Ch Combiner	**Existing Cross band repeaters - 3 VHF, 3-800 MHz (not included in P25 antenna system)** **RWIS**	6 ports	60 ft	2+2	39.44955	-115.999044	9548	DSCC75	6
Ragged Ridge	1	40 ft	4 Ch Combiner		8 ports	60 ft	2	37.713872	-116.091256	6887	DSCC75	4
Rocky Pt	1	40 ft	6 Ch Combiner		8 ports	60 ft	2	41.121675	-114.569083	8183	DSCC75	6
Sawtooth	1	8 ft	6 Ch Combiner		8 ports	8 ft	2	36.935578	-116.850778	5784	DSCC75	6
Schader	1	45 ft	4 Ch Combiner		8 ports	65 ft	2	36.462564	-116.059864	4344	DSCC75	4
Secret Pass	1	40 ft	4 Ch Combiner		8 ports	60 ft	2	40.832775	-115.146542	7408	DSCC75	4

SITE NAME	Tx Ant Ht (ft)	Tx Ant Model	Tx Ant Gain (dBd)	Multicoupler	Tower Top Amp	Rx Ant Ht (ft)	Rx Ant Model	Rx Ant Gain(dBd)	Rx Ant Gain (dBd Hzn)
Highland Pk	16	DS7C10F36U3N Vertical	9.9	CP00921-6MHzAC	CP00732	36	SC412-HF2LDF(D01-E5608)	11.4	9.9
Hoover Dam	80	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	100	SC412-HF2LDF(E5608)	11.4	11.4
Imlay	40	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	60	SC412-HF2LDF(E5608)	11.4	11.4
New Site - Indian Springs	40	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	60	SC412-HF2LDF(E5608)	11.4	11.4
Irish	45	DS7A06F36U-N	6	CP00921-6MHzAC	CP00732	65	DS7A08F36U-N	8	8
Kimberly	40	DS7A08F36U-N	8	CP00921-6MHzAC	CP00732	60	DS7C10F36U-N	10	10
Kinkaid	40	SC473-HF1LDF	3	CP00921-6MHzAC	CP00732	60	SC473-HF1LDF	3	3
Loray	80	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	100	SC412-HF2LDF(E5608)	11.4	11.4
Mary's	20	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	40	SC412-HF2LDF(E5608)	11.4	11.4
Mercury	30	DS7A08F36U-N	8	CP00921-6MHzAC	CP00732	50	DS7C10F36U-N	10	10
Mesquite	50	DS7A08F36U-N	8	CP00921-6MHzAC	CP00732	80	DS7C10F36U-N	10	10
Millers	40	DS7A08F36U-N	8	CP00921-6MHzAC	CP00732	60	DS7C10F36U-N	10	10
Montezuma	30	DS7A06F36U-N	6	CP00921-6MHzAC	CP00732	50	DS7A08F36U-N	8	8
Moses	40	DS7A06F36U-N	6	CP00921-6MHzAC	CP00732	60	DS7A08F36U-N	8	8
Muller	60	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	80	SC412-HF2LDF(E5608)	11.4	11.4
New Pass	60	DS7A06F36D-N	8	CP00921-6MHzAC	CP00732	80	DS7A06F36D-N	6	6
Palmetto	40	DS7A06F36U-N	6	CP00921-6MHzAC	CP00732	60	DS7A08F36U-N	8	8
Peavy Hill	40	SC473-HF1LDF	3	CP00921-6MHzAC	CP00732	60	SC476-HF1LDF	6.1	6.1
Penn Hill	40	DS7A08F36U-N	8	CP00921-6MHzAC	CP00732	60	DS7C10F36U-N	10	10
Pilot Pk	5	DS7A06F36U-N	6	CP00921-6MHzAC	CP00732	25	DS7A08F36U-N	8	8
Pinegrove	30	DS7A08F36U-N	8	CP00921-6MHzAC	CP00732	50	DS7C10F36U-N	10	10
Prospect Pk	40	DS7A06F36U-N	6	CP00921-6MHzAC	CP00732	60	DS7A08F36U-N	8	8
Ragged Ridge	40	DS7A06F36U-N	6	CP00921-6MHzAC	CP00732	60	DS7A08F36U-N	8	8
Rocky Pt	40	DS7A08F36U-N	8	CP00921-6MHzAC	CP00732	60	DS7C10F36U-N	10	10
Sawtooth	8	SC432D-HF6LDF(D00-I40-G06)	6	CP00921-6MHzAC	CP00732	8	SC432D-HF6LDF(D00-I40-G06)	6	6
Schader	45	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	65	SC412-HF2LDF(E5608)	11.4	11.4
Secret Pass	40	DS7A06F36U-N	6	CP00921-6MHzAC	CP00732	60	DS7A08F36U-N	8	8

	Member	Region	Core Assignment North or South	COUNTY	SITE NAME	STATE	CHS. P25 Phase 1 *Virtual Site	SITE TYPE
48	**NDOT**	**1**	**South**	Nye	Sober	NV	4	Multi-site
49	**NDOT**	**2**	**North**	Douglas	Spooner	NV	4	Multi-site
50	**NDOT**	**3**	**North**	Elko	Spruce	NV	**6**	Multi-site
51	**NDOT**	**3**	**North**	White Pine	Squaw Pk	NV	4	Multi-site
52	**NDOT**	**1**	**South**	Nye	Sunnyside	NV	5	Multi-site
53	**NDOT**	**1**	**South**	Nye	Timber	NV	4	Multi-site
54	**NDOT**	**2**	**North**	Pershing	Toulon	NV	**6**	Multi-site
55	**NDOT**	**3**	**North**	Humboldt	Trident Pk	NV	4	Multi-site
56	**NDOT**	**3**	**North**	Elko	Victoria	NV	4	Multi-site
57	**NDOT**	**1**	**South**	Nye	Warm Springs	NV	5	Multi-site
58	**NDOT**	**2**		Douglas	Wildoat	NV	5	Multi-site
59	**NDOT**	**1**	**South**	Lincoln	Wilson	NV	5	Multi-site
60	**NDOT**	**3**	**North**	Humboldt	Winnemucca	NV	5	Multi-site
61		**1**	**South**	Clark	**New Site - Deer Creek**	NV	4	Multi-site
62	**NDOT**	**3**	**North**	Humboldt	**New Site - Double H**	NV	4	Multi-site
63		**2**	**North**	Douglas	**Hot Springs**	NV	**6**	Multi-site
64	**NDOT**	**3**	**North**	Elko	**New Site - Jackpot (NDOT constructing)**	NV	4	Multi-site
65		**1**	**South**	Clark	**New Site - Mtn Springs**	NV	4	Multi-site
66	**NDOT**	**2**	**North**	Washoe	**New Site - Painted Rock (NDOT constructing)**	NV	**6**	Multi-site
67		**2**	**North**	CA	**New Site - Tahoe Mtn**	NV	4	Multi-site
68		**1**	**South**	Lincoln	**New Site - Tempiute**	NV	4	Multi-site
69	**NDOT**	**2**	**North**	Storey	**New Site - USA Pkwy (NDOT constructing)**	NV	5	Multi-site
70	**NDOT**	**1**	**South**	Lincoln	**New Site -S. of White River**	NV	4	Multi-site
						TOTAL CHS	**344**	**P25**
							78	**NCRN (800 MHz)**
							422	**Phase 1**

SITE NAME	TX Antennas	TX Antenna Height	Combiner Size	Additional Equipment at site	Receiver Multicoupler Size	Rx Antenna Height	# of Racks	Latitude	Longitude	Site Elevation (ft)	Combiner	Combiner Channels
Sober	1	10 ft	4 Ch Combiner	**Existing Cross band repeaters - 3 VHF, 3-800 MHz (not included in P25 ant sys)**	8 ports	30 ft	2+2	37.082192	-116.818139	4922	DSCC75	4
Spooner	1	60 ft	4 Ch Combiner		8 ports	80 ft	2	39.095808	-119.910672	6998	DSCC75	4
Spruce	1	35 ft	6 Ch Combiner	**Existing Cross band repeaters - 3 VHF, 3-800 MHz (not included in P25 antenna system) RWIS**	8 ports	55 ft	2+2	40.553075	-114.821467	10210	DSCC75	6
Squaw Pk	1	45 ft	4 Ch Combiner	**Existing Cross band repeaters - 3 VHF, 3-800 MHz (not included in P25 antenna system) RWIS**	8 ports	65 ft	2+2	39.281667	-114.894272	7215	DSCC75	4
Sunnyside	1	30 ft	5 Ch Combiner		8 ports	50 ft	2	38.451842	-115.012794	5328	DSCC75	5
Timber	1	20 ft	4 Ch Combiner		8 ports	40 ft	2	38.371794	-115.494839	9161	DSCC75	4
Toulon	1	5 ft	6 Ch Combiner	**Existing Cross band repeaters - 3 VHF, 3-800 MHz (not included in P25 antenna system) RWIS**	8 ports	20 ft	2+2	40.118022	-118.728522	6795	DSCC75	6
Trident Pk	1	25 ft	4 Ch Combiner	Future Cross band repeaters - 3 VHF, 3-800 MHz (not included in P25 ant sys)	8 ports	45 ft	2+2	41.88655	-118.409953	8455	DSCC75	4
Victoria	1	20 ft	4 Ch Combiner		8 ports	40 ft	2	40.322917	-114.562308	8554	DSCC75	4
Warm Springs	1	16 ft	5 Ch Combiner	**Existing Cross band repeaters - 3 VHF, 3-800 MHz (not included in P25 antenna system)**	8 ports	36 ft	2+2	38.191981	-116.418106	7556	DSCC75	5
Wildoat	1	50 ft	5 Ch Combiner		8 ports	70 ft	2	38.710081	-119.542344	5975	DSCC75	5
Wilson	1	40 ft	5 Ch Combiner		8 ports	60 ft	2	38.238033	-114.381653	9285	DSCC75	5
Winnemucca	1	30 ft	5 Ch Combiner	**Existing Cross band repeaters - 3 VHF, 3-800 MHz (not included in P25 antenna system) RWIS**	8 ports	50 ft	2+2	41.008128	-117.770058	6664	DSCC75	5
New Site - Deer Creek	1	60 ft	4 Ch Combiner		8 ports	80 ft	2	36.316667	-115.619639	8225	DSCC75	4
New Site - Double H	1	60 ft	4 Ch Combiner		8 ports	80 ft	2	41.4745	-118.0575	5030	DSCC75	4
Hot Springs	1	180 ft	6 Ch Combiner		8 ports	200 ft	2	39.065833	-119.721389	5916	DSCC75	6
New Site - Jackpot (NDOT constructing)	1	40 ft	4 Ch Combiner		8 ports	60 ft	2	41.989608	-114.658306	5263	DSCC75	4
New Site - Mtn Springs	1	80 ft	4 Ch Combiner		8 ports	100 ft	2	36.018394	-115.506022	5476	DSCC75	4
New Site - Painted Rock (NDOT constructing)	1	60 ft	6 Ch Combiner		8 ports	80 ft	2	39.891667	-119.368333	4173	DSCC75	6
New Site - Tahoe Mtn	1	60 ft	4 Ch Combiner		8 ports	80 ft	2	38.910278	-120.036111	7225	DSCC75	4
New Site - Tempiute	1	180 ft	4 Ch Combiner		8 ports	200 ft	2	37.625347	-115.634358	7809	DSCC75	4
New Site - USA Pkwy (NDOT constructing)	1	60 ft	5 Ch Combiner		8 ports	80 ft	2	39.480889	-119.394167	5958	DSCC75	5
New Site -S. of White River	1	180 ft	4 Ch Combiner		8 ports	200 ft	2	37.879442	-115.024019	5630	DSCC75	4

SITE NAME	Tx Ant Ht (ft)	Tx Ant Model	Tx Ant Gain (dBd)	Multicoupler	Tower Top Amp	Rx Ant Ht (ft)	Rx Ant Model	Rx Ant Gain(dBd)	Rx Ant Gain (dBd Hzn)
Sober	10	DS7A06F36U-N	6	CP00921-6MHzAC	CP00732	30	DS7A08F36U-N	8	8
Spooner	60	SC473-HF1LDF	3	CP00921-6MHzAC	CP00732	80	DS7A06F36U-N	6	6
Spruce	35	DS7A06F36U3N	6.5	CP00921-6MHzAC	CP00732	55	DS7A06F36U3N	6.5	6.3
Squaw Pk	45	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	65	SC412-HF2LDF(E5608)	11.4	11.4
Sunnyside	30	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	50	SC412-HF2LDF(E5608)	11.4	11.4
Timber	20	DS7A06F36U3N	6.5	CP00921-6MHzAC	CP00732	40	DS7A06F36U3N	6	4.2
Toulon	5	DS7A08F36U-N	8	CP00921-6MHzAC	CP00732	20	DS7C10F36U-N	10	10
Trident Pk	25	DS7A06F36U-N	6	CP00921-6MHzAC	CP00732	45	DS7A08F36U-N	8	8
Victoria	20	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	40	SC412-HF2LDF(E5608)	11.4	11.4
Warm Springs	16	DS7A06F36U-N	6	CP00921-6MHzAC	CP00732	36	DS7A08F36U-N	8	8
Wildoat	50	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	70	SC412-HF2LDF(E5608)	11.4	11.4
Wilson	40	DS7A08F36U-N	8	CP00921-6MHzAC	CP00732	60	DS7C10F36U-N	10	10
Winnemucca	30	DS7A08F36U-N	8	CP00921-6MHzAC	CP00732	50	DS7C10F36U-N	10	10
New Site - Deer Creek	60	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	80	SC412-HF2LDF(E5608)	11.4	11.4
New Site - Double H	60	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	80	SC412-HF2LDF(E5608)	11.4	11.4
Hot Springs	180	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	200	SC412-HF2LDF(E5608)	11.4	11.4
New Site - Jackpot (NDOT constructing)	40	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	60	SC412-HF2LDF(E5608)	11.4	11.4
New Site - Mtn Springs	80	DS7A06F36U6N	6	CP00921-6MHzAC	CP00732	100	DS7A06F36U6N	6	4.2
New Site - Painted Rock (NDOT constructing)	60	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	80	SC412-HF2LDF(E5608)	11.4	11.4
New Site - Tahoe Mtn	60	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	80	SC412-HF2LDF(E5608)	11.4	11.4
New Site - Tempiute	180	DS7C10F36U3N Vertical	9.9	CP00921-6MHzAC	CP00732	200	SC412-HF2LDF(D01-E5608)	11.4	9.9
New Site - USA Pkwy (NDOT constructing)	60	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	80	SC412-HF2LDF(E5608)	11.4	11.4
New Site -S. of White River	180	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	200	SC412-HF2LDF(E5608)	11.4	11.4

	Member	Region	Core Assignment North or South	COUNTY	SITE NAME	STATE	CHS. P25 Phase 1 *Virtual Site	SITE TYPE
NV ENERGY **VIDA Premier/Connect HA #2B -Edison, Washoe Co**								
1	NVE	2	North	Nevada	Alder Hill	CA	4	Multi-site
2	NVE	1	South	Clark	Angels	NV	8	Multi-site
3	NVE	3	North	Lander	Argenta	NV	6	Multi-site
4	NVE	2	North	Plumas	Beckworth	CA	4	Multi-site
5	NVE	1	South	Washinton	Beaver Dam	Utah	4	Multi-site
6	NVE	1	South	Clark	Bighorn	NV	7	Multi-site
7	NVE	1	South	Kane	Buckskin	Utah	3	Multi-site
8	NVE	3	North	Eureka	Chevas	NV	5	Multi-site
9	NVE	2	North	Washoe	Chimney	NV	16	Simulcast Cell#3 (Washoe Cluster)
10	NVE	1	South	Clark	Christmas Tree	NV	6	Multi-site
11	NVE	3	North	White Pine	Conners Pass	NV	5	Multi-site
12	NVE	3	North	Elko	East Twin	NV	8	Multi-site
13	NVE	2	North	Pershing	Fencemaker	NV	4	Multi-site
14	NVE	1	South	Clark	Glendale	NV	9	Simulcast Cell#7
15	NVE	1	South	Clark	Reid Gardner	NV	9	Simulcast Cell#7
16	NVE	1	South	Clark	Lenzie	NV	5	Simulcast Cell#6
17	NVE	1	South	Clark	New Site - Apex (NVE Microwave Site) (existing monopole twr)		5	Simulcast Cell#6
18	NVE	1	South	Clark	LV SC Beltway	NV	16	Simulcast Cell#2
19	NVE	1	South	Clark	New Site - LV SC Cabana	NV	16	Simulcast Cell#2
20	NVE	1	South	Clark	LV SC Cheyenne	NV	16	Simulcast Cell#2
21	NVE	1	South	Clark	New Site - LV SC Decatur	NV	16	Simulcast Cell#2
22	NVE	1	South	Clark	LV SC Durango	NV	16	Simulcast Cell#2
23	NVE	1	South	Clark	New Site - LV SC Ryan	NV	16	Simulcast Cell#2
24	NVE	1	South	Clark	LV SC Washington	NV	16	Simulcast Cell#2
25	NVE	1	South	Clark	LV SC Westside	NV	16	Simulcast Cell#2
26	NVE	1	South	Clark	Potosi	NV	8	Multi-site
28	NVE	1	South	Clark	Opal	NV	7	Multi-site
29	NVE	1	South	Coconiono	Page	AZ	3	Multi-site
30	NVE	2	North	Storey	Patrick	NV	8	Multi-site
31	NVE	2	North	Lyon	Pinenut	NV	8	Multi-site
32	NVE	1	South	Mohave	Pipe Springs	AZ	3	Multi-site
33	NVE	2	North	Lassen	Shaffer	CA	4	Multi-site
34	NVE	1	South	Clark	Sloan	NV	10	Multi-site
35	NVE	2	North	Mineral	TV Hill	NV	6	Multi-site
36	NVE	1	South	Clark	New Site - Mt Charleston	NV	4	Multi-site
37	NVE	2	North	Washoe	New Site - Ophir	NV	10	Multi-site
38	NVE	1	South	Lincoln	New Site - Pahranagat	NV	4	Multi-site
39	NVE	1	South	Clark	Blue Diamond	NV	4	Multi-site
40	NVE	1	South	Clark	New Site - Laughlin	AZ	6	Multi-site
42	NVE	1	South	Clark	New Site - Red Mtn	NV	4	Multi-site
						TOTAL CHS	325	P25
							9	NCRN (800 MHz)
							334	Phase 1

SITE NAME	TX Antennas	TX Antenna Height	Combiner Size	Additional Equipment at site	Receiver Multicoupler Size	Rx Antenna Height	# of Racks	Latitude	Longitude	Site Elevation (ft)	Combiner	Combiner Channels
Alder Hill	1	10 ft	4 Ch Combiner		8 ports	30 ft	2	39.352317	-120.195256	6697	DSCC85	4
Angels	1	25 ft	8 Ch Combiner		8 ports	45 ft	2	36.318986	-115.574856	8829	DSCC75	8
Argenta	1	80 ft	6 Ch Combiner	800 MHz (not included in P25 antenna system)	8 ports	100 ft	2+2	40.621228	-116.688742	7376	DSCC75	6
Beckworth	1	55 ft	4 Ch Combiner		8 ports	75 ft	2	39.768839	-120.436744	7225	DSCC75	4
Beaver Dam	1	65 ft	6 Ch Combiner		8 ports	90 ft	2	37.155961	-113.883322	7615	DSCC75	4
Bighorn	1	30 ft	7 Ch Combiner		8 ports	50 ft	2	35.614806	-115.355639	2792	DSCC75	7
Buckskin	1	70 ft	4 Ch Combiner		8 ports	90 ft	2	37.124517	-112.003228	5968	DSCC75	4
Chevas	1	40 ft	5 Ch Combiner		8 ports	60 ft	2	40.941731	-116.310406	7199	DSCC75	5
Chimney	2	80 ft	2, 8 Ch Combiners		16 ports	100 ft	4	39.460014	-119.958333	8134	DSCC75	10
Christmas Tree	1	70 ft	6 Ch Combiner		8 ports	90 ft	2	35.249472	-114.743306	4777	DSCC75	6
Conners Pass	1	100 ft	5 Ch Combiner		8 ports	120 ft	2	39.024281	-114.644189	8084	DSCC75	5
East Twin	1	90 ft	8 Ch Combiner		8 ports	110 ft	2	40.928589	-115.844044	7422	DSCC75	8
Fencemaker	1	40 ft	4 Ch Combiner		8 ports	60 ft	2	40.079067	-117.831897	6824	DSCC75	4
Glendale	1	70 ft	9 Ch Combiner		16 ports	90 ft	3	36.684764	-114.5185	2179	DSCC75	9
Reid Gardner	1	210 ft	9 Ch Combiner		16 ports	230 ft	3	36.658267	-114.636003	1598	DSCC75	9
Lenzie	**1**	130 ft	5 Ch Combiner		8 ports	150 ft	2	36.385667	-114.920444	2228	DSCC75	5
New Site - Apex (NVE Microwave Site) (existing monopole twr)	1	50 ft	6 Ch Combiner		8 ports	70 ft	2	36.333708	-114.976092	3386	DSCC75	5
LV SC Beltway	2	70 ft	2, 8 Ch Combiners		16 ports	90 ft	3	36.058831	-115.218361	2395	DSCC75	8
New Site - LV SC Cabana	2	80 ft	2, 8 Ch Combiners		16 ports	100 ft	3	36.114703	-115.057181	1693	DSCC75	8
LV SC Cheyenne	2	60 ft	2, 8 Ch Combiners		16 ports	80 ft	3	36.219447	-115.277167	2441	DSCC75	8
New Site - LV SC Decatur	2	80 ft	2, 8 Ch Combiners		16 ports	100 ft	3	36.114239	-115.212453	2277	DSCC75	8
LV SC Durango	2	80 ft	2, 8 Ch Combiners		16 ports	100 ft	3	36.115694	-115.276639	2539	DSCC75	8
New Site - LV SC Ryan	2	100 ft	2, 8 Ch Combiners		16 ports	120 ft	3	36.245528	-115.117753	1942	DSCC75	8
LV SC Washington	2	40 ft	2, 8 Ch Combiners		16 ports	60 ft	3	36.182967	-115.137086	1969	DSCC75	8
LV SC Westside	2	70 ft	2, 8 Ch Combiners		16 ports	90 ft	3	36.15775	-115.277639	2648	DSCC75	8
Potosi	1	50 ft	8 Ch Combiner		8 ports	70 ft	2	35.965253	-115.500553	8393	DSCC75	8
Opal	1	20 ft	7 Ch Combiner		8 ports	40 ft	2	35.701164	-114.892028	4787	DSCC75	7
Page	1	30 ft	4 Ch Combiner		8 ports	50 ft	2	36.902056	-111.3934	4370	DSCC75	4
Patrick	1	230 ft	8 Ch Combiner		8 ports	250 ft	2	39.552417	-119.534417	4593	DSCC75	8
Pinenut	1	5 ft	8 Ch Combiner	Existing Cross band repeaters - 3 VHF, 3-800 MHz (not included in P25 antenna system)	8 ports	22 ft	2+2	39.197514	-119.489625	8088	DSCC75	8
Pipe Springs	1	60 ft	4 Ch Combiner		8 ports	80 ft	2	36.881106	-112.809239	6582	DSCC75	4
Shaffer	1	80 ft	4 Ch Combiner		8 ports	100 ft	2	40.446756	-120.358078	6690	DSCC75	4
Sloan	1	50 ft	10 Ch Combiner		16 ports	70 ft	3	35.951264	-115.191844	3268	DSCC75	10
TV Hill	1	65 ft	6 Ch Combiner	**Existing Cross band repeaters - 3 VHF, 3-800 MHz (not included in P25 antenna system)**	8 ports	85 ft	2+2	38.45765	-118.765406	10253	DSCC75	6
New Site - Mt Charleston	1	40 ft	4 Ch Combiner		8 ports	40 ft	2	36.257533	-115.643297	7530	DSCC75	4
New Site - Ophir	1	100 ft	10 Ch Combiner		16 ports	125 ft	3	39.318558	-119.6698	7746	DSCC75	10
New Site - Pahranagat	1	150 ft	4 Ch Combiner		8 ports	170 ft	2	37.252769	-115.003711	5781	DSCC75	4
Blue Diamond	1	69 ft	4 Ch Combiner		8 ports	80 ft	2	36.106628	-115.402983	4823	DSCC75	4
New Site - Laughlin	1	100 ft	6 Ch Combiner		8 ports	120 ft	2	35.146642	-114.599803	725	DSCC75	6
New Site - Red Mtn	1	25 ft	4 Ch Combiner		8 ports	45 ft	2	35.995353	-114.864631	3534	DSCC75	4

SITE NAME	Tx Ant Ht (ft)	Tx Ant Model	Tx Ant Gain (dBd)	Multicoupler	Tower Top Amp	Rx Ant Ht (ft)	Rx Ant Model	Rx Ant Gain(dBd)	Rx Ant Gain (dBd Hzn)
Alder Hill	10	SC432D-HF6LDF(D00-I45-G00)	0	CP00921-6MHzAC	CP00732	30	SC432D-HF6LDF(D00-I45-G00)	0	-0.2
Angels	25	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	45	SC412-HF2LDF(E5608)	11.4	11.4
Argenta	80	DS7A08F36U-N	8	CP00921-6MHzAC	CP00732	100	DS7C10F36U-N	10	10
Beckworth	55	DS7A08F36U-N	8	CP00921-6MHzAC	CP00732	75	DS7C10F36U-N	10	10
Beaver Dam	65	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	90	SC412-HF2LDF(E5608)	11.4	11.4
Bighorn	30	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	50	SC412-HF2LDF(E5608)	11.4	11.4
Buckskin	70	DS7A06F36U-N	8	CP00921-6MHzAC	CP00732	90	SC412-HF2LDF(E5608)	11.4	11.4
Chevas	40	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	60	SC412-HF2LDF(E5608)	11.4	11.4
Chimney	35	DS7C10F36U3N Vertical	9.9	CP00921-6MHzAC	CP00732	50	SC412-HF2LDF(D04-E5608)	11.5	5.3
Christmas Tree	70	DS7A08F36U-N	8	CP00921-6MHzAC	CP00732	90	DS7C10F36U-N	10	10
Conners Pass	100	DS7A08F36U-N	8	CP00921-6MHzAC	CP00732	120	DS7C10F36U-N	10	10
East Twin	90	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	110	SC412-HF2LDF(E5608)	11.4	11.4
Fencemaker	40	DS7A08F36U-N	8	CP00921-6MHzAC	CP00732	60	DS7C10F36U-N	10	10
Glendale	70	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	90	SC412-HF2LDF(E5608)	11.4	11.4
Reid Gardner	210	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	230	SC412-HF2LDF(E5608)	11.4	11.4
Lenzie	130	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	150	SC412-HF2LDF(E5608)	11.4	11.4
New Site - Apex (NVE Microwave Site) (existing monopole twr)	50	DS7A08F36U-N	8	CP00921-6MHzAC	CP00732	70	DS7C10F36U-N	10	10
LV SC Beltway	70	DS7A08F36U-N	8	CP00921-6MHzAC	CP00732	90	DS7C10F36U-N	10	10
New Site - LV SC Cabana	80	SE414-SWBPALDF(D00)_R90	10	CP00921-6MHzAC	CP00732	100	SE414-SWBPALDF(D00)_R90	11.4	11.4
LV SC Cheyenne	60	SE419-SWBP4LDF(D00)	10	CP00921-6MHzAC	CP00732	80	SE419-SWBP4LDF(D00)	8	8
New Site - LV SC Decatur	80	DS7A08F36U-N	8	CP00921-6MHzAC	CP00732	100	DS7C10F36U-N	10	10
LV SC Durango	80	DS7A08F36U-N	8	CP00921-6MHzAC	CP00732	100	DS7C10F36U-N	10	10
New Site - LV SC Ryan	100	SE419-SWBPALDF(D00)_R105	13.1	CP00921-6MHzAC	CP00732	120	SE419-SWBPALDF(D00)_R105	11.4	11.4
LV SC Washington	40	DS7A08F36U-N	8	CP00921-6MHzAC	CP00732	60	DS7C10F36U-N	10	10
LV SC Westside	70	DS7A08F36U-N	8	CP00921-6MHzAC	CP00732	90	DS7C10F36U-N	10	10
Potosi	50	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	70	SC412-HF2LDF(E5608)	11.4	11.4
Opal	20	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	40	SC412-HF2LDF(E5608)	11.4	11.4
Page	30	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	50	SC412-HF2LDF(E5608)	11.4	11.4
Patrick	230	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	250	SC412-HF2LDF(E5608)	11.4	11.4
Pinenut	5	DS7A08F36U-N	8	CP00921-6MHzAC	CP00732	22	DS7C10F36U-N	10	10
Pipe Springs	60	DS7A08F36U-N	8	CP00921-6MHzAC	CP00732	80	DS7C10F36U-N	10	10
Shaffer	80	DS7A08F36U-N	8	CP00921-6MHzAC	CP00732	100	DS7C10F36U-N	10	10
Sloan	50	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	70	SC412-HF2LDF(E5608)	11.4	11.4
TV Hill	65	DS7A06F36U-N	6	CP00921-6MHzAC	CP00732	85	DS7A08F36U-N	8	8
New Site - Mt Charleston	40	DS7A06F36U3N	6.5	CP00921-6MHzAC	(None)	40	SC479-HF1LDF(D00-E6085)	9.9	5.1
New Site - Ophir	100	DS7C10F36U3N Vertical	9.9	CP00921-6MHzAC	CP00732	125	DS7C10F36U3N Vertical	9.9	5.1
New Site - Pahranagat	150	SE414-SWBP2LDF(D00)	7.5	CP00921-6MHzAC	(None)	170	SE414-SWBPALDF(D00)_R90	10	10
Blue Diamond	60	DS7A08F36U-N	8	CP00921-6MHzAC	CP00732	80	DS7C10F36U-N	10	10
New Site - Laughlin	100	DS7A08F36U-N	8	CP00921-6MHzAC	CP00732	120	DS7C10F36U-N	10	10
New Site - Red Mtn	25	DS7C10F36U-N	10	CP00921-6MHzAC	CP00732	45	SC412-HF2LDF(E5608)	11.4	11.4

NSRS System Drawings

HARRIS Communication Systems Division, Public Safety & Professional Communications	CRM# 16CS02712
PRELIMINARY ENGINEERING SKETCH COMPANY CONFIDENTIAL	TABLE OF CONTENTS
PREPARED BY: A. OGDEN	
DATE: 7/25/2018	Nevada Shared Radio System
SKETCH #: 16CS02712	SHEET # 1 OF 21

VIDA Premier Core
127 RF Sites

Las Vegas SANS (NDOT)
Primary VIDA Core - South

Primary VIDA Premier Core Includes;
VIDA Application Server (VAS)
-Network Switching (NSS1) VM
-Unified Admin. System VM
-Enterprise Network Manager VM
-Regional Network Mgr VM
-Regional Site Mgr VM
-Active Directory VM
-McAfee Epolicy Orchestrator VM
-BeOn VM
- KMF VM
-SUMS Server
-Transcoder VM
-ISSI VM
-StatusAware VM

Firewall
Router
Unitrends Backup
Encompass Gateway (VM) – 102 Talkpaths
NCRN Sites
ISSI/CSSI Gateway (VM) – 4 connections
-20 talkpaths per connection
-1 connection dedicated to 75 third party console interfaces
EDACS Legacy System
New EDACS Migration Gateway – 24 Talkpaths
VIDA Management Terminal (1)
Existing Asset Management System
Internet Firewall

Connection to Local P25 Radio System
Connection To 3rd Party Consoles
BeOn Connection
Internet

Washoe NOC (WC)
Secondary VIDA Core - North

Firewall
Router
Unitrends Backup
Secondary VIDA Core Includes;
VIDA Application Server (VAS)
-Network Switching (NSS2) VM
-Enterprise Network Manager VM
-Regional Network Mgr VM
-Regional Site Mgr VM
-Active Directory VM
-BeOn
-Transcoder VM
-ISSI VM
Internet Firewall
BeOn Connection
Internet

Multiple Network Management Locations – (WC)
Customer Provided Router & Network Connection
Network Management Terminals (10)

Multiple Control Station Locations (WC)
(2) New Control Stations
(2) Existing Control Stations

Multiple Control Station Locations (NDOT)
(48) New Control Stations + Tone Remote
(53) Existing Control Stations + Tone Remote

Multiple Control Station Locations (NVE)
(35) New Control Stations

Multiple Network Management Locations – (NDOT)
Network Management Terminals (10)
Customer Provided Router & Network Connection

Multiple Network Management Locations – (NVE)
Network Management Terminals (6)
Customer Provided Router & Network Connection

NSRS Provided Backhaul

Connect Core - South

Connect Core - North

LEGEND

- Control Site
- RF 'Multicast' Site
- RF Simulcast Site
- Dispatch/Control Stations
- NCRN Sites
- RWIS Sites
- Site-on-Wheels

HARRIS Communication Systems Division, Public Safety & Professional Communications

CRM# 16CS02712

PRELIMINARY ENGINEERING SKETCH
COMPANY CONFIDENTIAL

HIGH-LEVEL SYSTEM BLOCK DIAGRAM - PREMIER

PREPARED BY: A. OGDEN
DATE: 7/25/2018
SKETCH #: 16CS02712

Nevada Shared Radio System

VIDA Connect Core – North (70 RF Sites)

Washoe NOC (WC)

Primary VIDA Connect Core - North

Primary VIDA Connect Core Includes;
VIDA Application Server (VAS)
-Network Switching (NSS1) VM
-Enterprise Network Manager VM
-Regional Network Mgr VM
-Regional Site Mgr VM
-Active Directory VM
-BeOn VM[1]
- KMF VM[1]
-SUMS Server[1]
-Transcoder VM
-ISSI VM[1]
-StatusAware VM[1]

Router

Redundant Logging Recorders (WC) (2 X 144 Talkpaths)

Upgrade to Existing Asset Management System

VIDA Management Terminal (1)

EDACS Legacy System

Existing EDACS Migration Gateway

Redundant Logging Recorders (WCSD) (2 X 48 Talkpaths)

Existing/New NCRN Sites - North

To co-located SAR

800/VHF Cross-Band Repeater

Austin (NDOT)
Bald Mtn (NDOT)
Cave Mtn (NDOT)
Eagle Ridge (NDOT)
Elko Mtn (NDOT)
Ellen Dee (NDOT)
Mary's Mtn (NDOT)
Peavine (NDOT)
Peavy Hill (NDOT)
Penn Hill (NDOT)
Pine Grove (NDOT)
Pinenut (NDOT)
Poito (NDOT)
Prospect Pk (NDOT)
Spruce Mtn (NDOT)
Squaw Peak (NDOT)
Toulon Pk (NDOT)
Winnemucca (NDOT)
3-Mile[3] (NDOT)
Argenta[3] (NDOT)
Fairview[3] (NDOT)
Moses[3] (NDOT)
Trident[3] (NDOT)
(23 Sites)

Existing RWIS Sites - North

200 kb/15 min

Austin Mtn (NDOT)
Border Inn (NDOT)
Cave Mtn (NDOT)
Ellen Dee (NDOT)
Hickison (NDOT)
Kimberly (WC)
Peavy Hill (NDOT)
Penn Hill (NDOT)
Pinegrove (NDOT)
Prospect Pk (NDOT)
Spruce (NDOT)
Squaw Pk (NDOT)
Toulon (NDOT)
Winnemucca (NDOT)
(14 Sites)

Edison (NVE)

Secondary VIDA Connect Core - North

Router

Secondary VIDA Connect Core Includes;
VIDA Application Server (VAS)
-Network Switching (NSS2) VM
-Enterprise Network Manager VM
-Regional Network Mgr VM
-Regional Site Mgr VM
-Active Directory VM
-BeOn VM[1]
-Transcoder VM
-ISSI VM[1]

VIDA Management Terminal (1)

Edison Dispatch - North (NVE)

Redundant Routers

Existing Symphony Consoles[4] (6)

GOB Dispatch (NVE)

Customer Provided Router & Network Connection

Redundant Logging Recorders (NVE) (2 X 176 Talkpaths)

Multiple Dispatch Locations - North (NDOT)

Redundant Routers

New Symphony Consoles (5)
Existing Symphony Consoles[4] (9)

Multiple Dispatch Locations - North (WC)

Redundant Routers

New Symphony Consoles (12)
Existing Symphony Consoles[4] (27)

Reno/Carson City - North (DPS)

(114) New Control Stations

NSRS Provided Backhaul

700 MASTR V 4 Channels — Site-on-Wheels (WC)

800 MASTR V 4 Channels — Site-on-Wheels (NVE)

800 MASTR V 4 Channels — Site-on-Wheels (NVE)

P25 Simulcast Systems

Biltmore (WC) & Snowflake (WC)

Redundant Routers
(2) DCPs
MASTR V 8 Channels

Marble (WC) & Virginia Peak (WC)

Redundant Routers
(2) DCPs
MASTR V 10 Channels

Mt Rose (WC) & Slide Mtn (WC)

Redundant Routers
(2) DCPs
MASTR V 12 Channels

Peavine (WC)[5], Red Pk (WC)[5] & Chimney Pk (NVE)

Redundant Routers
MASTR V 16 Channels

Redundant Routers — MASTR V 3 Channels

49 Mtn (WC)
Yellow Pk (WC)
(2 Sites)

Redundant Routers — MASTR V 4 Channels

Red Rock (WC)
Alder Hill, CA (NVE)
Beckworth, CA (NVE)
Fencemaker (NVE)
Shaffer, CA (NVE)
Austin (NDOT)
Border Inn (NDOT)
Buster[2] (NDOT)
Emigrant (NDOT)
Flatcreek (NDOT)
HD Summit (NDOT)
Hickison (NDOT)
Moses (NDOT)
New Pass (NDOT)
Penn Hill (NDOT)
Secret Pass (NDOT)
Spooner (NDOT)
Squaw Peak (NDOT)
Trident (NDOT)
Victoria (NDOT)
Jackpot (NDOT)
Double H (NDOT)
Tahoe Mtn (NDOT)
(23 Sites)

Redundant Routers — MASTR V 5 Channels

Fox (WC)
Chevas (NVE)
Conners Pass (NVE)
3-Mile (NDOT)
Bald West (NDOT)
Cave (NDOT)
Ellen Dee (NDOT)
Fairview Pk (NDOT)
Kimberly (NDOT)
Loray (NDOT)
Pinegrove (NDOT)
Wildoat (NDOT)
Winnemucca (NDOT)
USA Hwy (NDOT)
(14 Sites)

Redundant Routers — MASTR V 6 Channels

Poito (WC)
Argenta (NVE)
Muller (NDOT)
Golconda (NDOT)
Imlay (NDOT)
Peavy Hill (NDOT)
Prospect Pk (NDOT)
Rocky Point (NDOT)
Spruce (NDOT)
TV Hill (NVE)
Toulon (NDOT)
Painted Rock (NDOT)
Hot Springs (NDOT)
(13 Sites)

Redundant Routers — MASTR V 7 Channels

Eagle Ridge (NDOT)
Mary's Mtn (NDOT)
(2 Sites)

Redundant Routers — MASTR V 8 Channels

Truckee Station 18 (WC)
East Twin (NVE)
Patrick (NVE)
Pinenut (NVE)
Elko Mtn (NDOT)
(5 Sites)

Redundant Routers — MASTR V 10 Channels

Ophir (NVE)
(1 Site)

Redundant Routers — MASTR V 12 Channels

Smokey Quartz (WC)
(1 Site)

Customer Provided 4-Wire Interfaces

To co-located SAR

(1) Interoperability Gateways - 8 Talkpaths Each

Washoe County
(15 Sites)

[1]These features are housed on the VIDA Premier Core
[2]Solar sites (MASTR V @ 20W)
[3]New NCRN Sites
[4]Windows 10 software upgrade needed
[5]Existing 4-ch simulcast sites with DCPs

LEGEND

- Control Site
- RF 'Multicast' Site
- RF Simulcast Site
- Dispatch/Control Stations
- NCRN Sites
- RWIS Sites
- Site-on-Wheels

HARRIS — Communication Systems Division, Public Safety & Professional Communications

CRM# 16CS02712

PRELIMINARY ENGINEERING SKETCH
COMPANY CONFIDENTIAL

HIGH-LEVEL SYSTEM BLOCK DIAGRAM - NORTH CONNECT

PREPARED BY: A. OGDEN
DATE: 7/25/2018
SKETCH #: 16CS02712

Nevada Shared Radio System

VIDA Connect Core – South (57 RF Sites)

FAST Center (NDOT)
Primary VIDA Connect Core - South

Primary VIDA Connect Core Includes;
VIDA Application Server (VAS)
-Network Switching (NSS1) VM
-Enterprise Network Manager VM
-Regional Network Mgr VM
-Regional Site Mgr VM
-Active Directory VM
-BeOn VM[1]
- KMF VM[1]
-SUMS Server[1]
-Transcoder VM
-ISSI VM[1]
-StatusAware VM[1]

Router
Redundant Logging Recorders (NDOT) (2 X 296 Talkpaths)
Redundant Logging Recorders (DPS) (2 X 72 Talkpaths)
Customer Provided Ethernet Backhaul Connections
Interoperability Gateway 36 Talkpaths

FAST Center - South (DPS)
(10) New Control Stations

Multiple Dispatch Locations - South (NDOT)
Redundant Routers
New Symphony Consoles (4)
Existing Symphony Consoles[4] (11)

Site-on-Wheels (NDOT)
700 MASTR V 4 Channels
800 TB9400 1 Channel - Conv

Existing/New NCRN Sites - South
To co-located SAR
800/VHF Cross-Band Repeater

Fitzpatrick (NDOT)
Highland Pk (NDOT)
Mt Brock (NDOT)
Pilot Pk (NDOT)
Sober Pk (NDOT)
TV Hill (NDOT)
Warm Springs (NDOT)
Caliente[3] (NDOT)
Currant Summit[3] (NDOT)
Mesquite[3] (NDOT)
Overton[3] (NDOT)
(11 Sites)

Existing RWIS Sites - South
Mt Brock (NDOT)
Currant Summit (NDOT)
Pilot Pk (NDOT)
(3 Sites)

Site-on-Wheels (NDOT)
700 MASTR V 4 Channels

Beltway (NDOT)
Secondary VIDA Connect Core - South

Router
New Asset Management System (NVE)

Secondary VIDA Connect Core Includes;
VIDA Application Server (VAS)
-Network Switching (NSS2) VM
-Enterprise Network Manager VM
-Regional Network Mgr VM
-Regional Site Mgr VM
-Active Directory VM
-BeOn VM[1]
-Transcoder VM
-ISSI VM[1]

Redundant Logging Recorders (NVE) (2 X 176 Talkpaths)

Beltway Dispatch - South (NVE)
Redundant Routers
New Symphony Consoles (6)
Existing Symphony Consoles[4] (9)

NSRS Provided Backhaul

Buckskin, UT (NVE) Page, AZ (NVE) Pipe Springs, AZ (NVE) (3 Sites)
Redundant Routers
MASTR V 3 Channels

Blue Diamond (NVE) Mt Charleston (NVE) Pahranagat[5] (NVE) Red Mtn (NVE) Beaver Dam, UT (NVE) Alamo (NDOT) Amargosa (NDOT) Caliente (NDOT) Currant Summit (NDOT) Fitzpatrick[2] (NDOT) Hoover Dam (NDOT) Indian Springs[6] (NDOT) Millers (NDOT) Mtn Springs (NDOT) Mt Irish[2] (NDOT) Montezuma (NDOT) Palmetto (NDOT) Pilot Peak (NDOT) Ragged Ridge (NDOT) Schader[2] (NDOT) Sober (NDOT) Timber[2] (NDOT) Deer Creek (NDOT) Tempiute (NDOT) White River (NDOT) (25 Sites)
Redundant Routers
MASTR V 4 Channels

Highland Peak (NDOT) Kinkaid (NDOT) Mercury (NDOT) Sunnyside (NDOT) Warm Springs (NDOT) Wilson (NDOT) (6 Sites)
Redundant Routers
MASTR V 5 Channels

Christmas Tree (NVE) Laughlin (NVE) Coyote Springs (NDOT) Mesquite (NDOT) Sawtooth (NDOT) (5 Sites)
Redundant Routers
MASTR V 6 Channels

Big Horn (NVE) Opal (NVE) Brock (NDOT) (3 Sites)
Redundant Routers
MASTR V 7 Channels

Angel's Pk (NVE) Potosi (NVE) (2 Sites)
Redundant Routers
MASTR V 8 Channels

Sloan (NVE) (1 Site)
Redundant Routers
MASTR V 10 Channels

P25 Simulcast Systems

Beltway, Cabana, Cheyenne, Decatur, Durango, Ryan Center, Washington & Westside (NVE)
Redundant Routers
MASTR V 16 Channels
(2) DCPs

Apex & Lenzie (NVE)
Redundant Routers
(2) DCPs
MASTR V 5 Channels

Glendale & Reid Gardner (NVE)
Redundant Routers
(2) DCPs
MASTR V 9 Channels

[1]These features are housed on the VIDA Premier Core
[2]Solar sites (MASTR V @ 20W)
[3]New NCRN Sites
[4]Software upgrade needed
[5]Virtual site, no MASTR V
[6]NVE to maintain

LEGEND
- Control Site
- RF 'Multicast' Site
- RF Simulcast Site
- Dispatch/Control Stations
- NCRN Sites
- RWIS Sites
- Site-on-Wheels

HARRIS — Communication Systems Division — Public Safety & Professional Communications

CRM# 16CS02712

PRELIMINARY ENGINEERING SKETCH
COMPANY CONFIDENTIAL

HIGH-LEVEL SYSTEM BLOCK DIAGRAM - SOUTH CONNECT

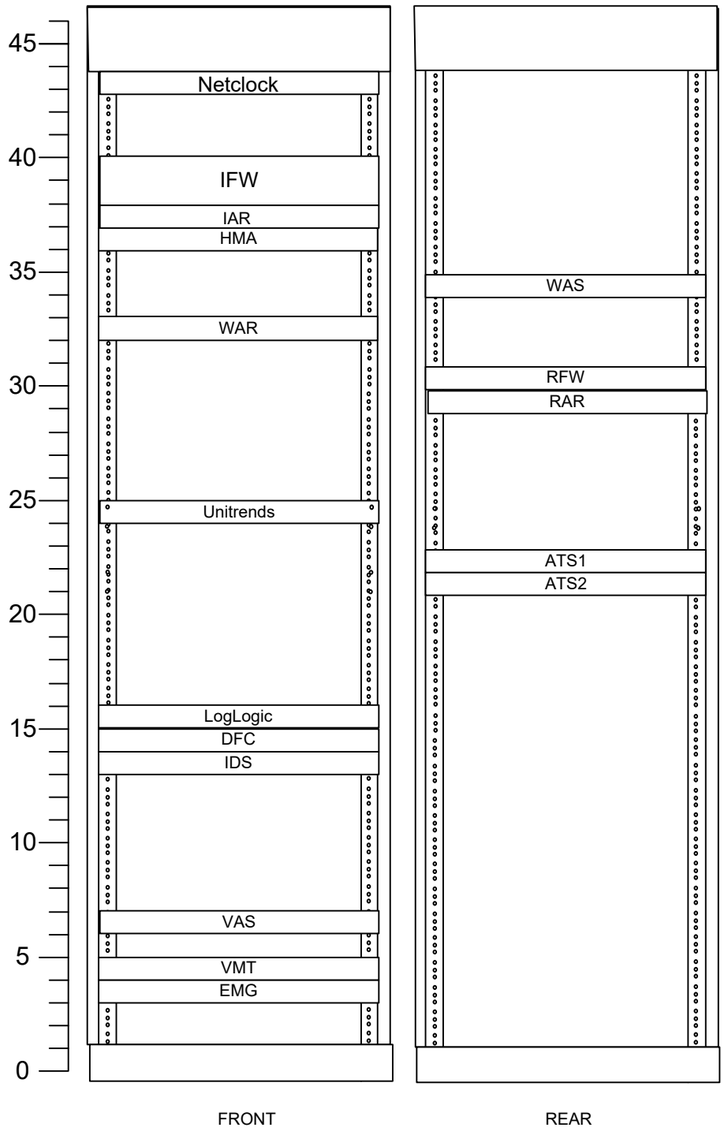
PREPARED BY: A. OGDEN
DATE: 7/25/2018
SKETCH #: 16CS02712

Nevada Shared Radio System

SHEET # 4 OF 21

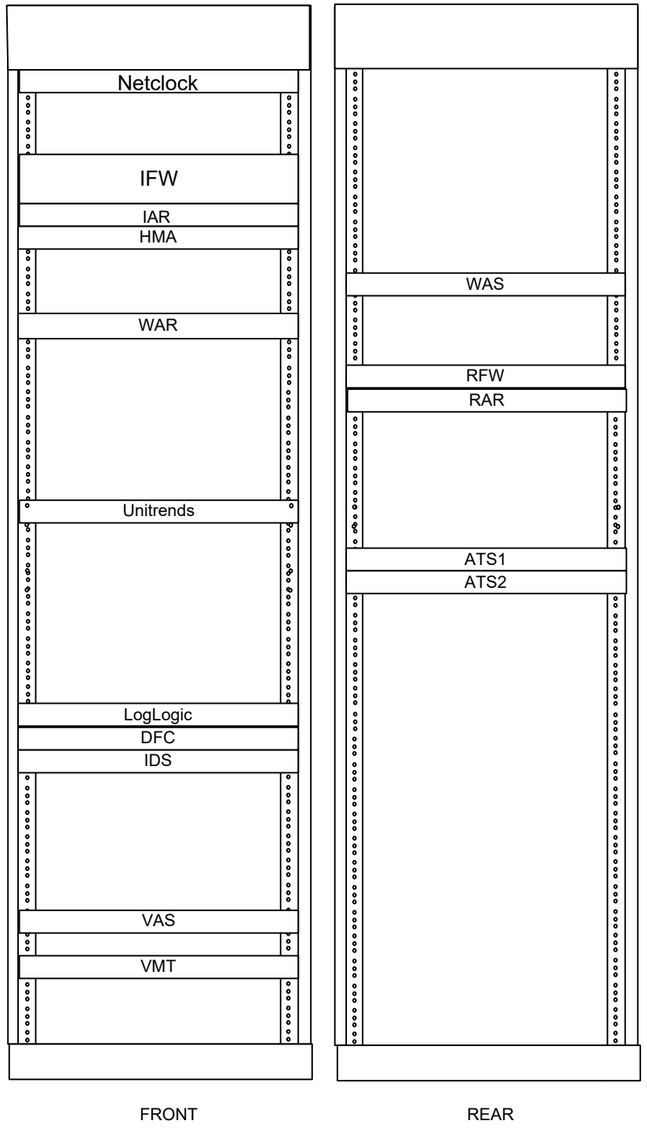
VIDA Premier Cores – High Availability

NDOT – Las Vegas SANS



Primary NSC Rack

Washoe – Washoe NOC



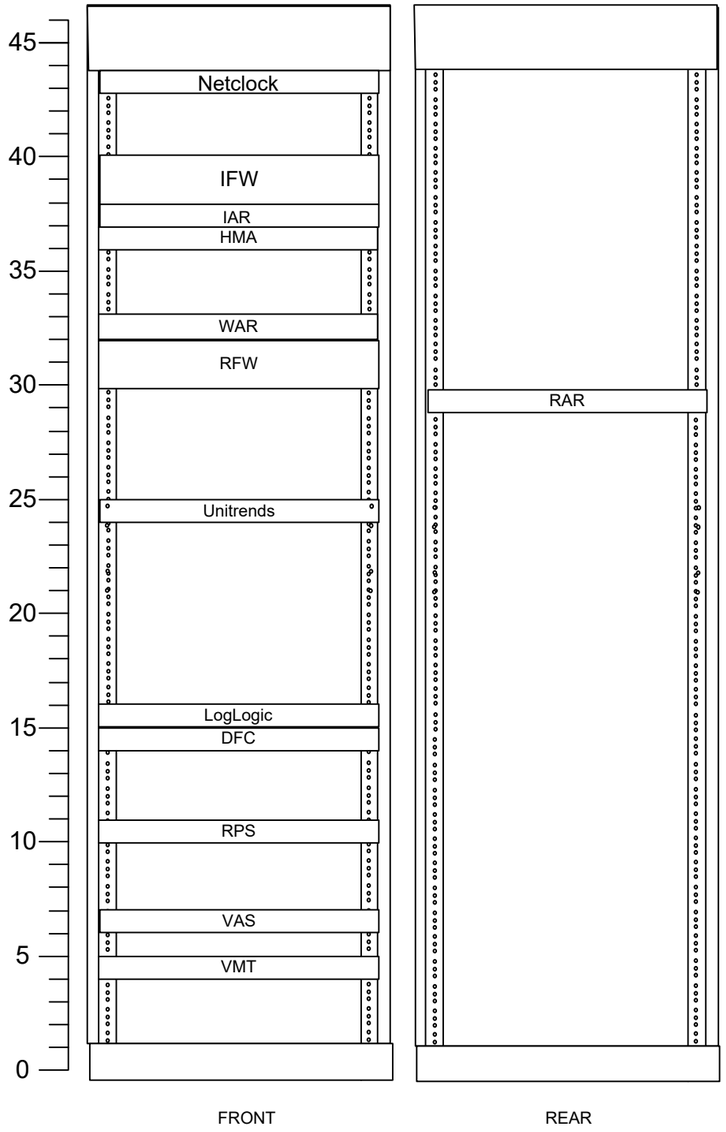
Secondary NSC Rack

NOTES:
(1) THIS IS A REPRESENTATIVE DRAWING. INSTALLED EQUIPMENT AND RACKUP TO BE DETERMINED DURING FINAL SYSTEM DESIGN.

HARRIS — Communication Systems Division, Public Safety & Professional Communications	CRM# 16CS02712
PRELIMINARY ENGINEERING SKETCH COMPANY CONFIDENTIAL	NDOT/Washoe VIDA Premier Rack-up
PREPARED BY: A. OGDEN	
DATE: 7/25/2018	Nevada Shared Radio System
SKETCH #: 16CS02712	SHEET # 5 OF 21

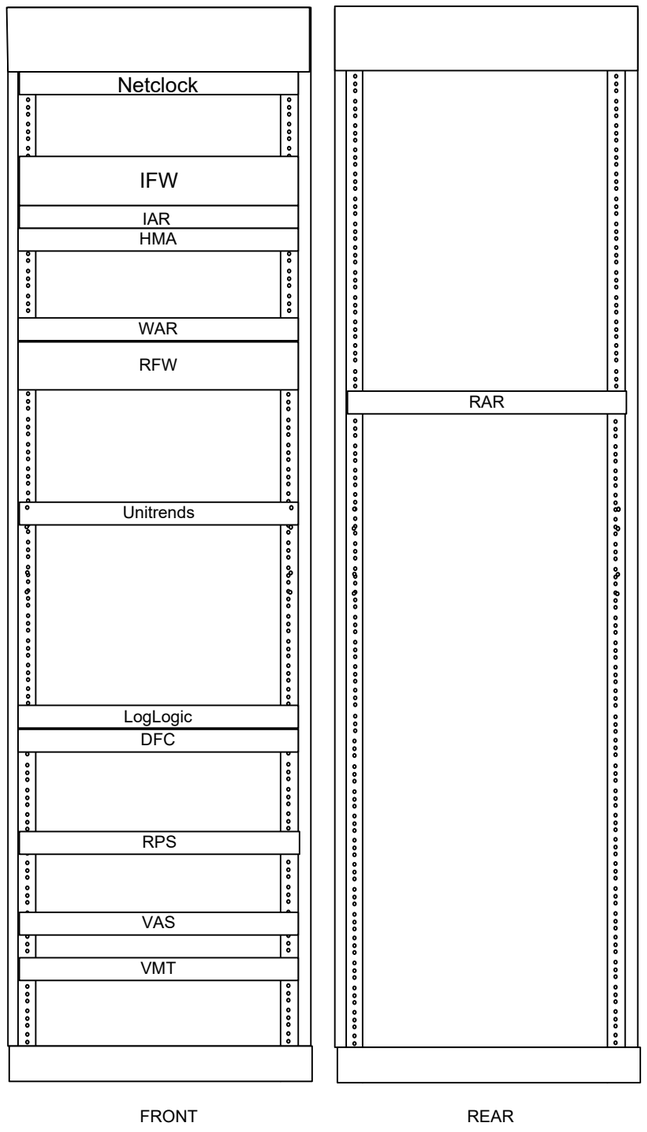
VIDA Connect Core (North) – High Availability

Washoe – Washoe NOC



Primary NSC Rack

NVE – Edison



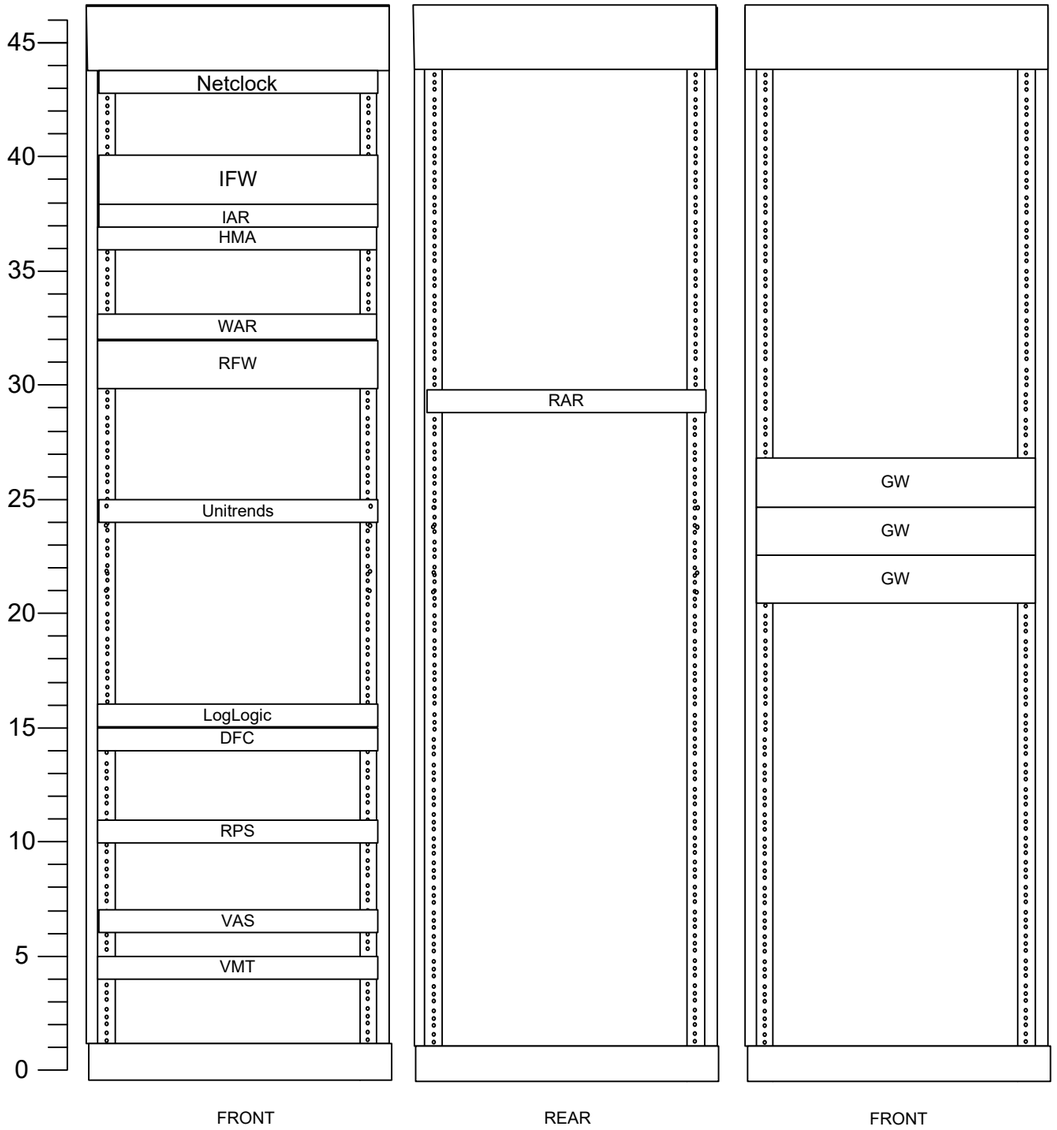
Secondary NSC Rack

NOTES:
(1) THIS IS A REPRESENTATIVE DRAWING. INSTALLED EQUIPMENT AND RACKUP TO BE DETERMINED DURING FINAL SYSTEM DESIGN.

HARRIS — Communication Systems Division, Public Safety & Professional Communications	CRM# 16CS02712
PRELIMINARY ENGINEERING SKETCH COMPANY CONFIDENTIAL	WASHOE/NVE VIDA CONNECT (NORTH) RACK-UP
PREPARED BY: A. OGDEN	
DATE: 7/25/2018	Nevada Shared Radio System
SKETCH #: 16CS02712	SHEET # 6 OF 21

VIDA Connect Core (South) – High Availability

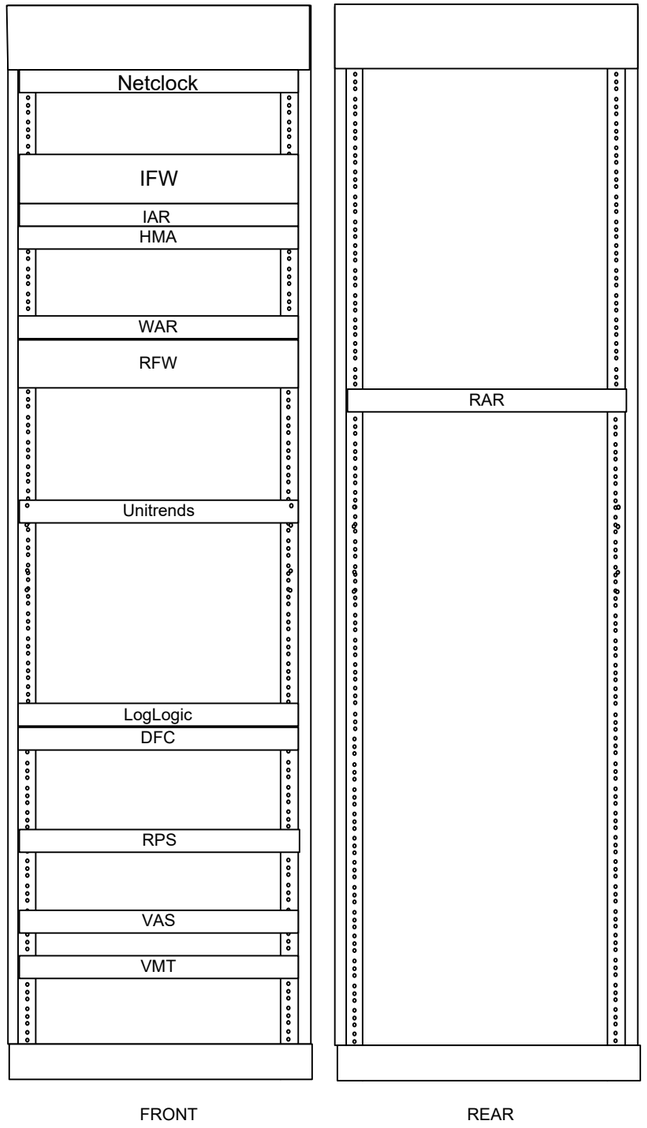
NDOT – FAST Center



Primary NSC Rack

Interoperability Rack

NDOT - Beltway



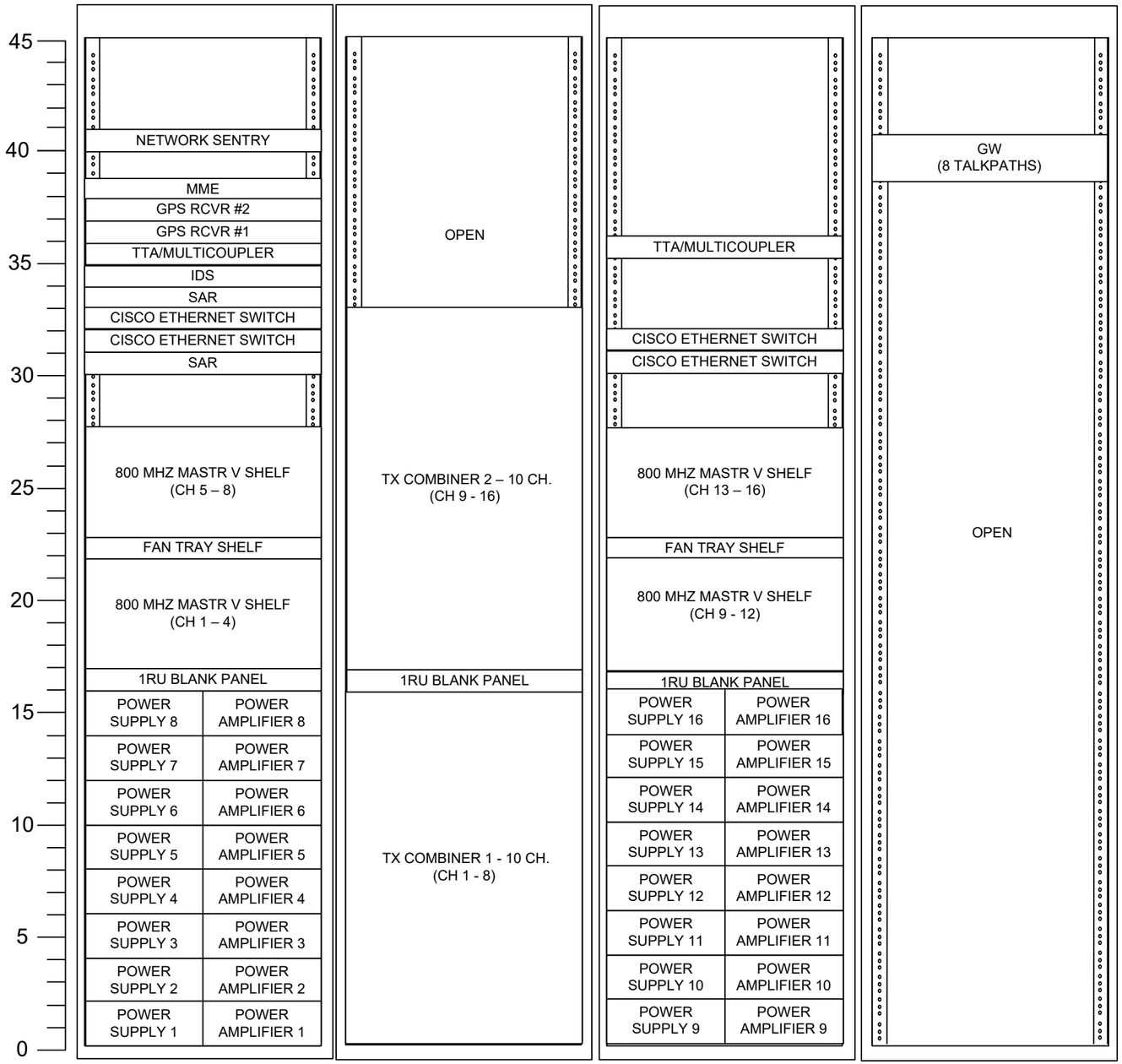
Secondary NSC Rack

NOTES:
(1) THIS IS A REPRESENTATIVE DRAWING. INSTALLED EQUIPMENT AND RACKUP TO BE DETERMINED DURING FINAL SYSTEM DESIGN.

HARRIS — Communication Systems Division, Public Safety & Professional Communications	CRM# 16CS02712
PRELIMINARY ENGINEERING SKETCH COMPANY CONFIDENTIAL	NDOT VIDA Connect (South) Rack-up
PREPARED BY: A. OGDEN	
DATE: 7/25/2018	Nevada Shared Radio System
SKETCH #: 16CS02712	SHEET # 7 OF 21

P25T Phase 2 Simulcast RF Site Rack-up

16 Channel, 3 Sites P25 IP Simulcast
(Peavine – DCP (Washoe)^2, Red Peak – DCP (Washoe)^2, Chimney Peak (NVE))

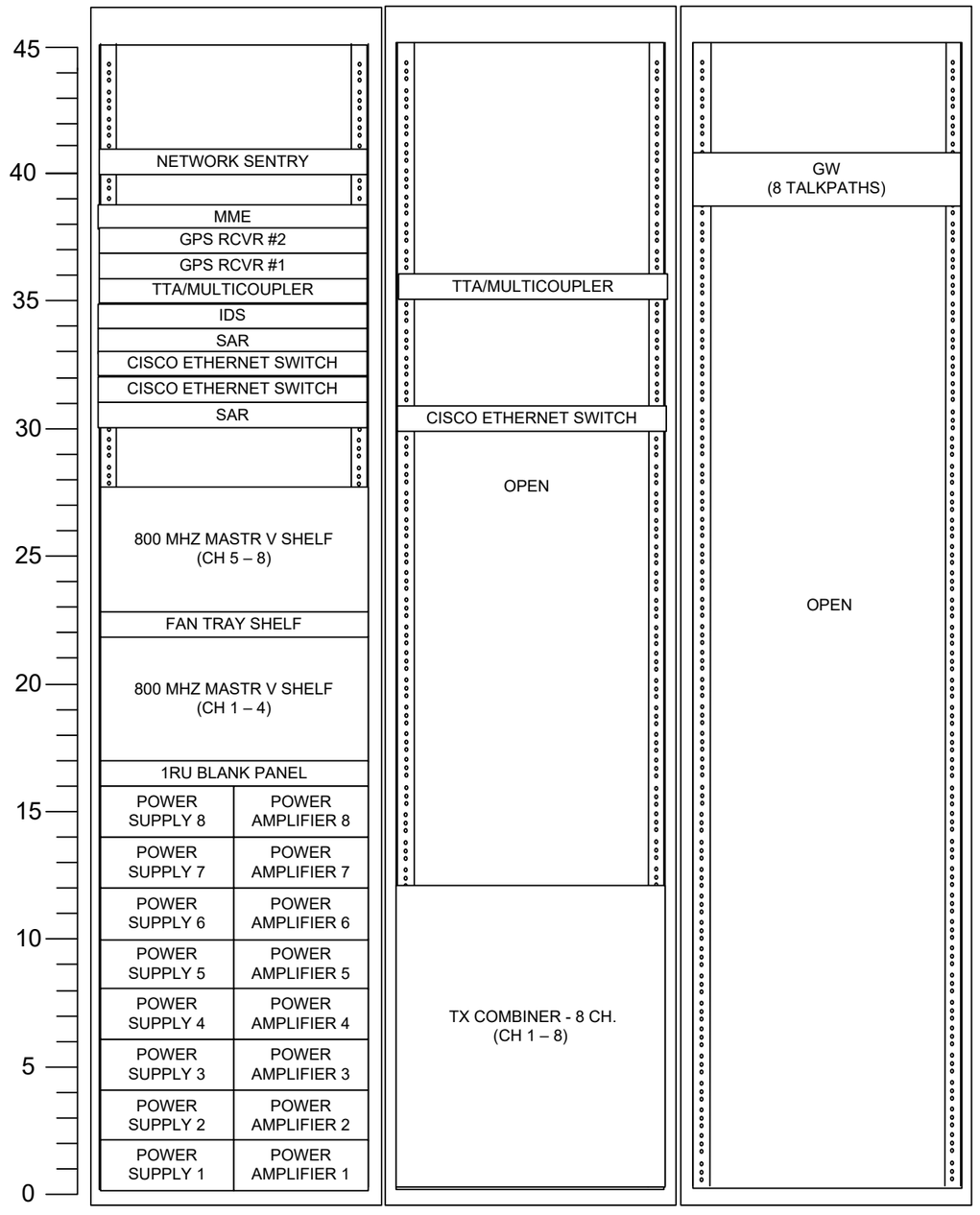


NOTES:
(1) THIS IS A REPRESENTATIVE DRAWING. INSTALLED EQUIPMENT AND RACKUP TO BE DETERMINED DURING FINAL SYSTEM DESIGN.
(2) EXISTING 2-SITE, 4-CH DCP SIMULCAST SITE
(3) DISTRIBUTION PANELS ARE INSTALLED ON THE BACK OF THE RACKS, NOT SHOWN.

HARRIS Communication Systems Division Public Safety & Professional Communications	CRM# 16CS02712
PRELIMINARY ENGINEERING SKETCH COMPANY CONFIDENTIAL	WASHOE SIMULCAST (WC) - RACK-UP
PREPARED BY: A. OGDEN	
DATE: 7/25/2018	Nevada Shared Radio System
SKETCH #: 16CS02712	SHEET # 8 OF 21

P25T Phase 2 Simulcast RF Site Rack-up

8 Channel, 2 Sites, P25 IP Simulcast
(Biltmore – DCP and Snowflake – DCP)
(Washoe)

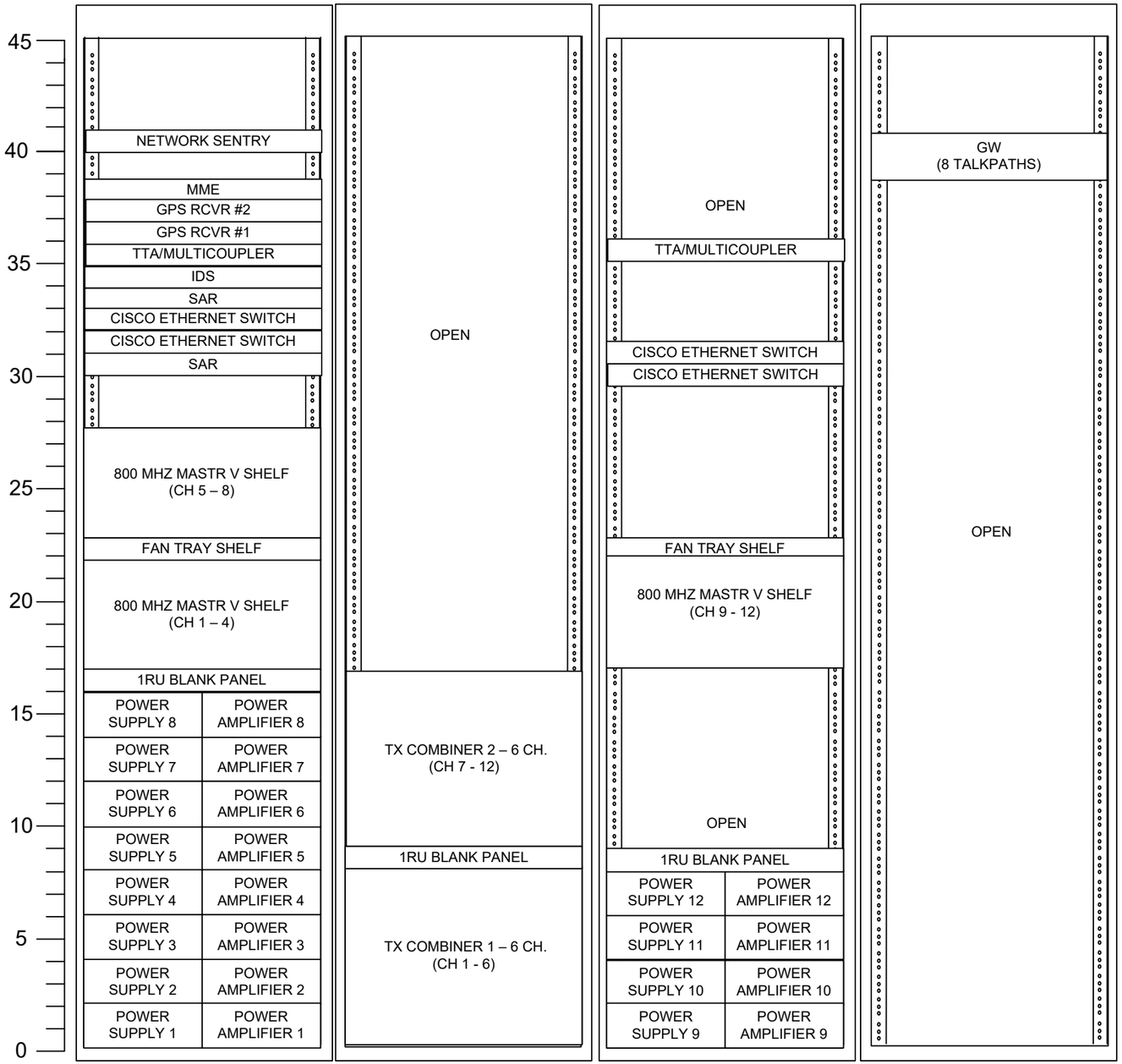


NOTES:
(1) THIS IS A REPRESENTATIVE DRAWING. INSTALLED EQUIPMENT AND RACKUP TO BE DETERMINED DURING FINAL SYSTEM DESIGN.
(2) DISTRIBUTION PANELS ARE INSTALLED ON THE BACK OF THE RACKS, NOT SHOWN.

HARRIS — Communication Systems Division, Public Safety & Professional Communications	CRM# 16CS02712
PRELIMINARY ENGINEERING SKETCH COMPANY CONFIDENTIAL	TAHOE SIMULCAST (WC) - RACK-UP
PREPARED BY: A. OGDEN	
DATE: 7/25/2018	Nevada Shared Radio System
SKETCH #: 16CS02712	SHEET # 9 OF 21

P25T Phase 2 Simulcast RF Site Rack-up

12 Channel, 2 Sites P25 IP Simulcast
(Slide Mtn – DCP and Mt Rose – DCP)
(Washoe)



NOTES:
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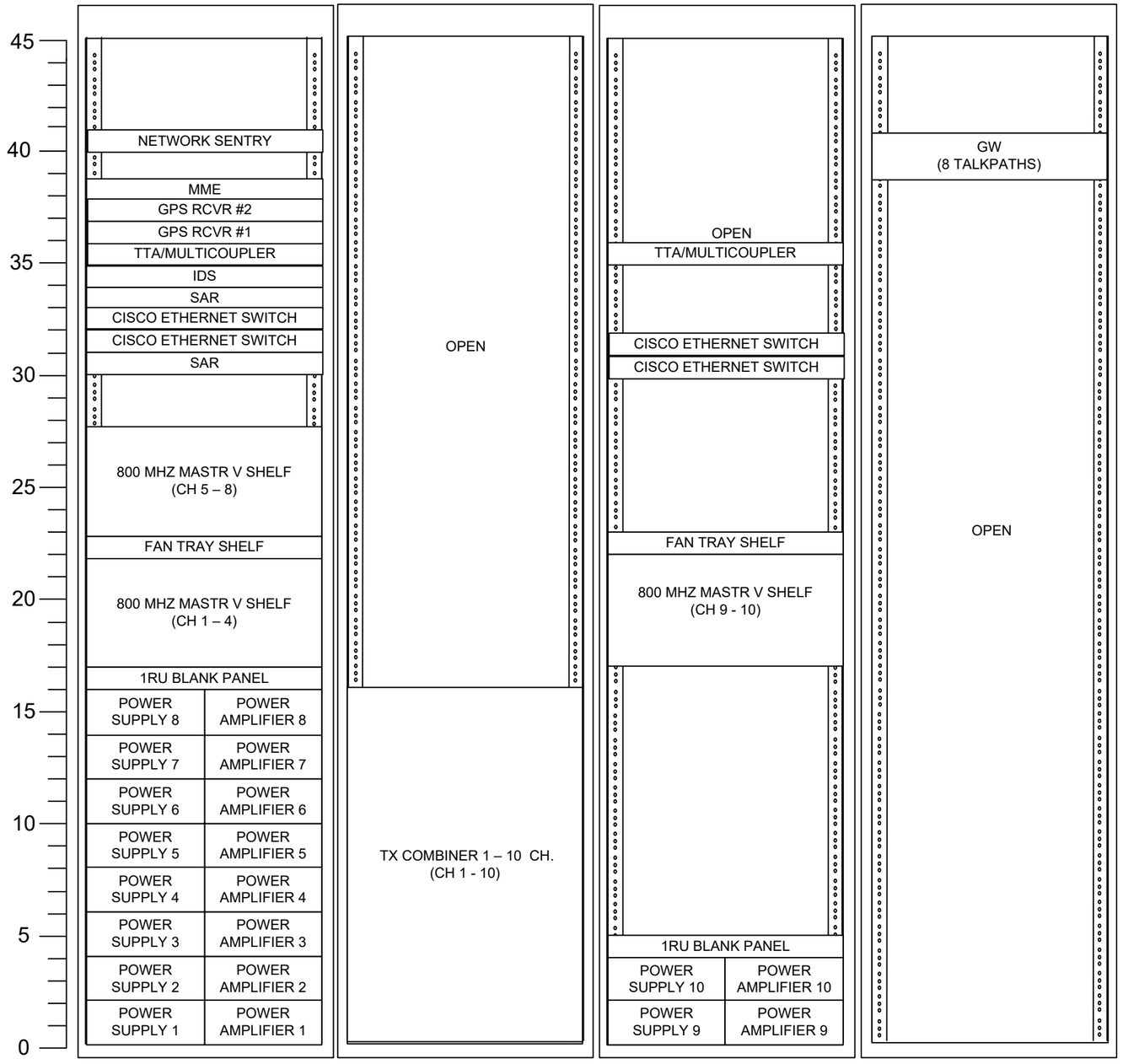
(2) DISTRIBUTION PANELS ARE INSTALLED ON THE BACK OF THE RACKS, NOT SHOWN.

HARRIS Communication Systems Division Public Safety & Professional Communications	CRM# 16CS02712
PRELIMINARY ENGINEERING SKETCH COMPANY CONFIDENTIAL	SOUTH SIMULCAST - RACK-UP
PREPARED BY: A. OGDEN	Nevada Shared Radio System
DATE: 7/25/2018	
SKETCH #: 16CS02712	SHEET # 10 OF 21

P25T Phase 2 Simulcast RF Site Rack-up

10 Channels, 2 Sites P25 IP Simulcast
(Virginia Peak – DCP and Marble Bluff – DCP)
(Washoe)



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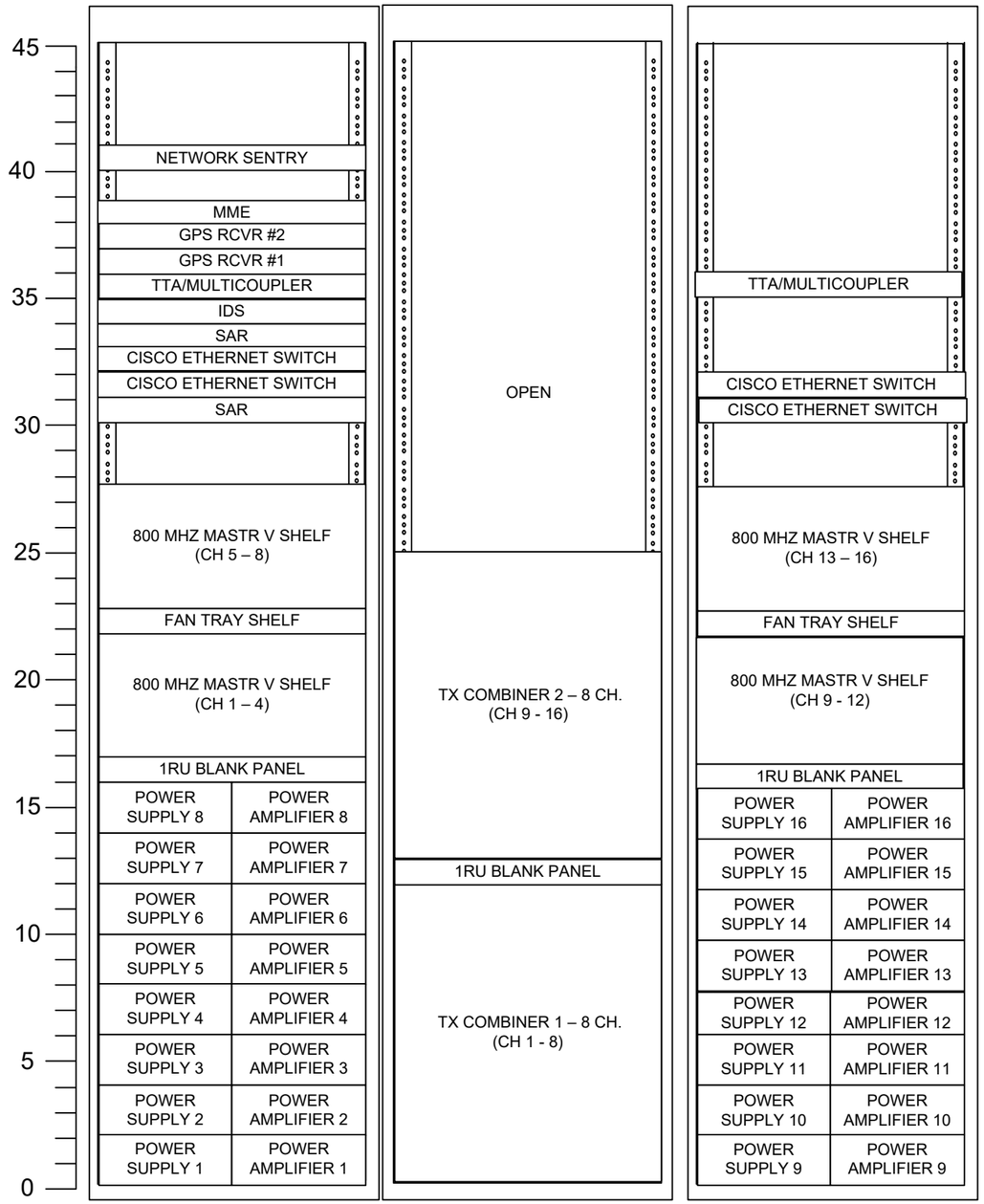
(2) DISTRIBUTION PANELS ARE INSTALLED ON THE BACK OF THE RACKS, NOT SHOWN.

HARRIS Communication Systems Division Public Safety & Professional Communications	CRM# 16CS02712
PRELIMINARY ENGINEERING SKETCH COMPANY CONFIDENTIAL	PYRAMID SIMULCAST - RACK-UP
PREPARED BY: A. OGDEN	Nevada Shared Radio System
DATE: 7/25/2018	
SKETCH #: 16CS02712	SHEET # 11 OF 21

P25T Phase 2 Simulcast RF Site Rack-up

16 Channel, 8 Sites, P25 IP Simulcast
(Beltway, Cabana, Cheyenne, Decatur, Durango - DCP, Ryan Center, Washington, Westside - DCP)
(NVE)



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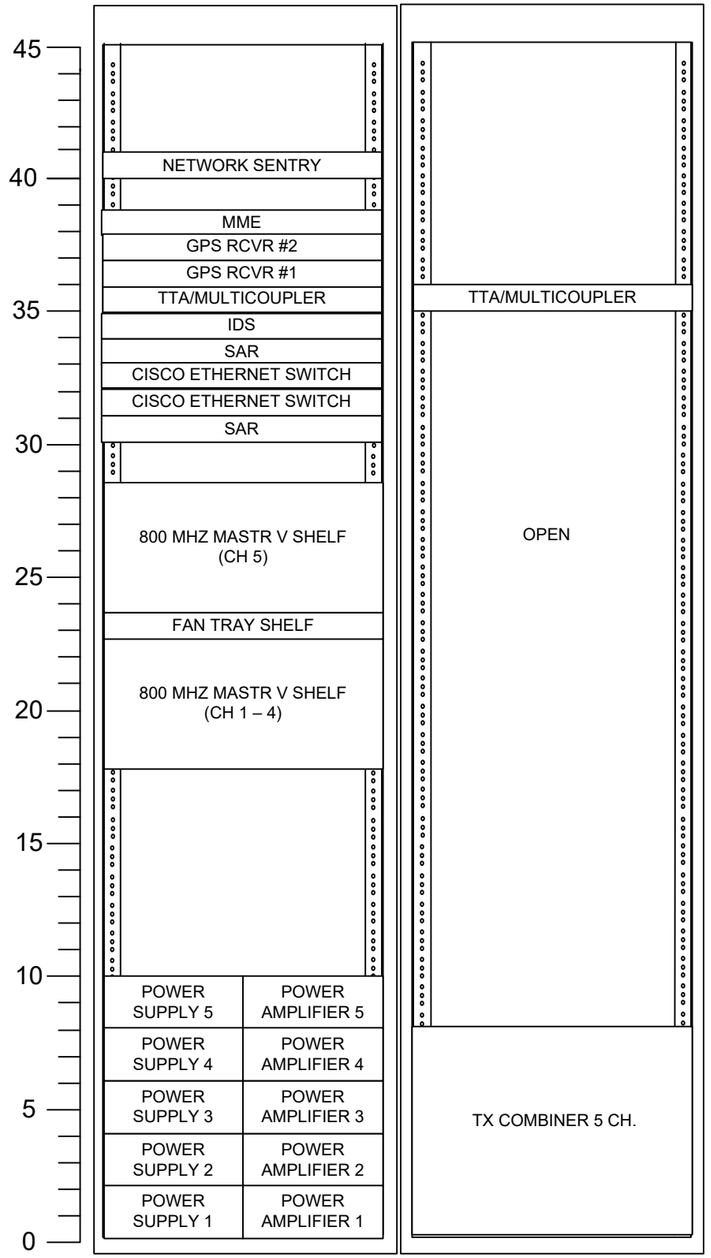
(2) DISTRIBUTION PANELS ARE INSTALLED ON THE BACK OF THE RACKS, NOT SHOWN.

HARRIS — Communication Systems Division, Public Safety & Professional Communications	CRM# 16CS02712
PRELIMINARY ENGINEERING SKETCH COMPANY CONFIDENTIAL	LAS VEGAS SIMULCAST (NVE) - RACK-UP
PREPARED BY: A. OGDEN	
DATE: 7/25/2018	Nevada Shared Radio System
SKETCH #: 16CS02712	SHEET # 12 OF 21

P25T Phase 2 Simulcast RF Site Rack-up

5 Channel, 2 Sites, P25 IP Simulcast
(Lenzie Plant – DCP, and Apex – DCP)
(NVE)

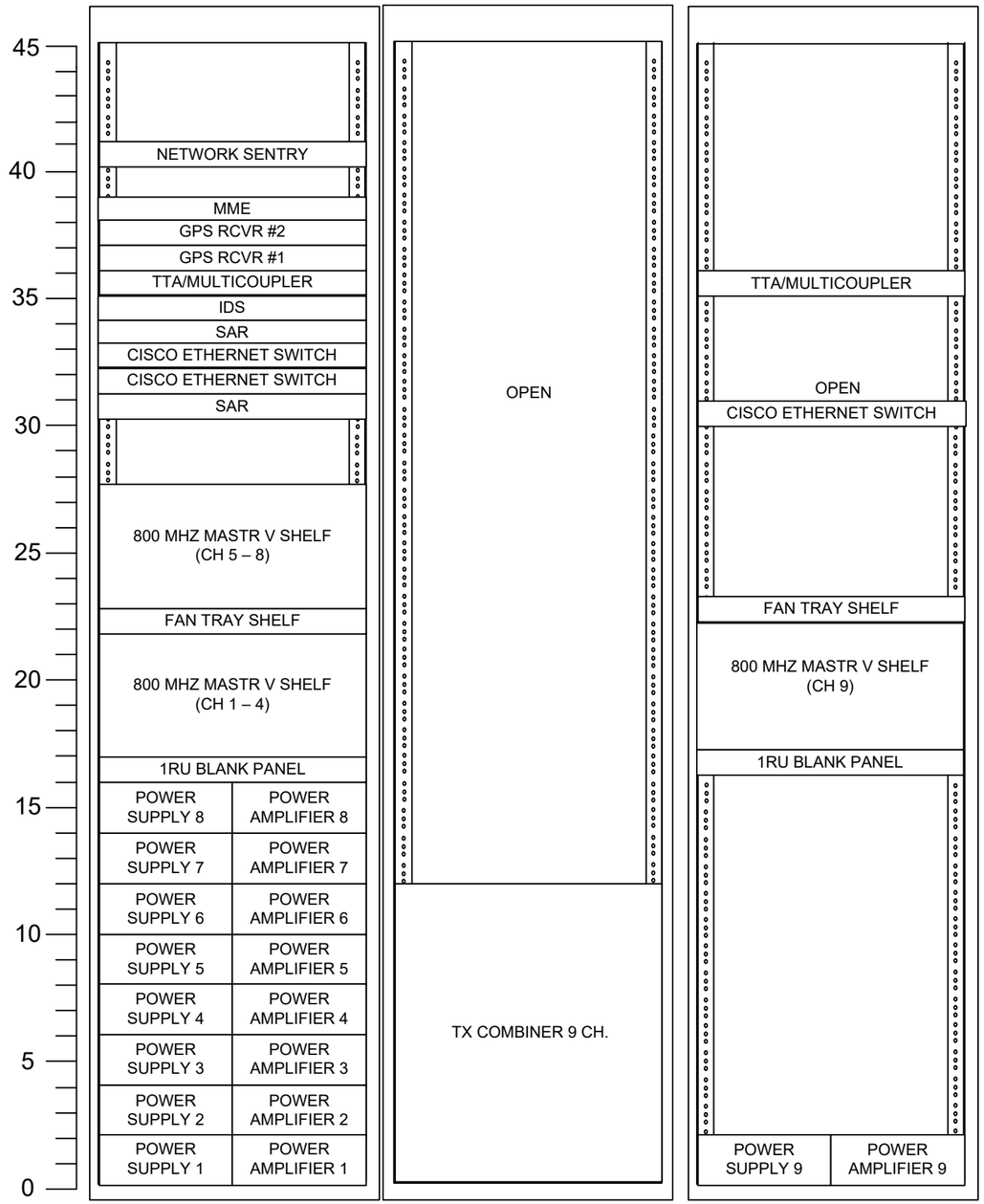


NOTES:
(1) THIS IS A REPRESENTATIVE DRAWING. INSTALLED EQUIPMENT AND RACKUP TO BE DETERMINED DURING FINAL SYSTEM DESIGN.
(2) DISTRIBUTION PANELS ARE INSTALLED ON THE BACK OF THE RACKS, NOT SHOWN.

HARRIS COMMUNICATION SYSTEMS DIVISION PUBLIC SAFETY & PROFESSIONAL COMMUNICATIONS	CRM# 16CS02712
PRELIMINARY ENGINEERING SKETCH COMPANY CONFIDENTIAL	CLARK CO SIMULCAST (NVE) - RACK-UP
PREPARED BY: A. OGDEN	Nevada Shared Radio System
DATE: 7/25/2018	SHEET # 13 OF 21
SKETCH #: 16CS02712	

P25T Phase 2 Simulcast RF Site Rack-up

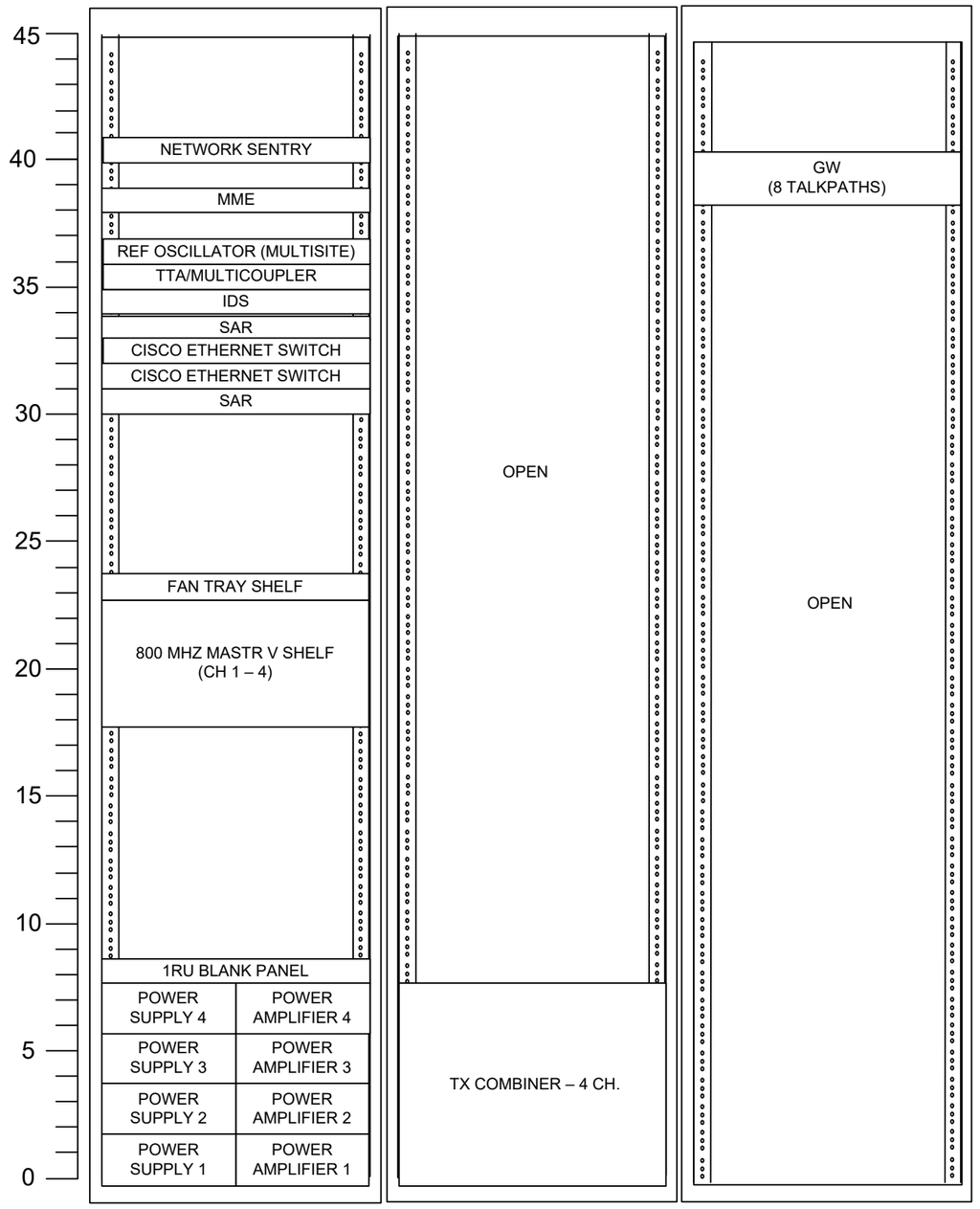
9 Channel, 2 Sites, P25 IP Simulcast
(Glendale – DCP, and Reid Gardner – DCP)
(NVE)



NOTES:
(1) THIS IS A REPRESENTATIVE DRAWING. INSTALLED EQUIPMENT AND RACKUP TO BE DETERMINED DURING FINAL SYSTEM DESIGN.
(2) DISTRIBUTION PANELS ARE INSTALLED ON THE BACK OF THE RACKS, NOT SHOWN.

HARRIS — Communication Systems Division, Public Safety & Professional Communications	CRM# 16CS02712
PRELIMINARY ENGINEERING SKETCH COMPANY CONFIDENTIAL	NVE SIMULCAST 1 - RACK-UP
PREPARED BY: A. OGDEN	
DATE: 7/25/2018	Nevada Shared Radio System
SKETCH #: 16CS02712	SHEET # 14 OF 21

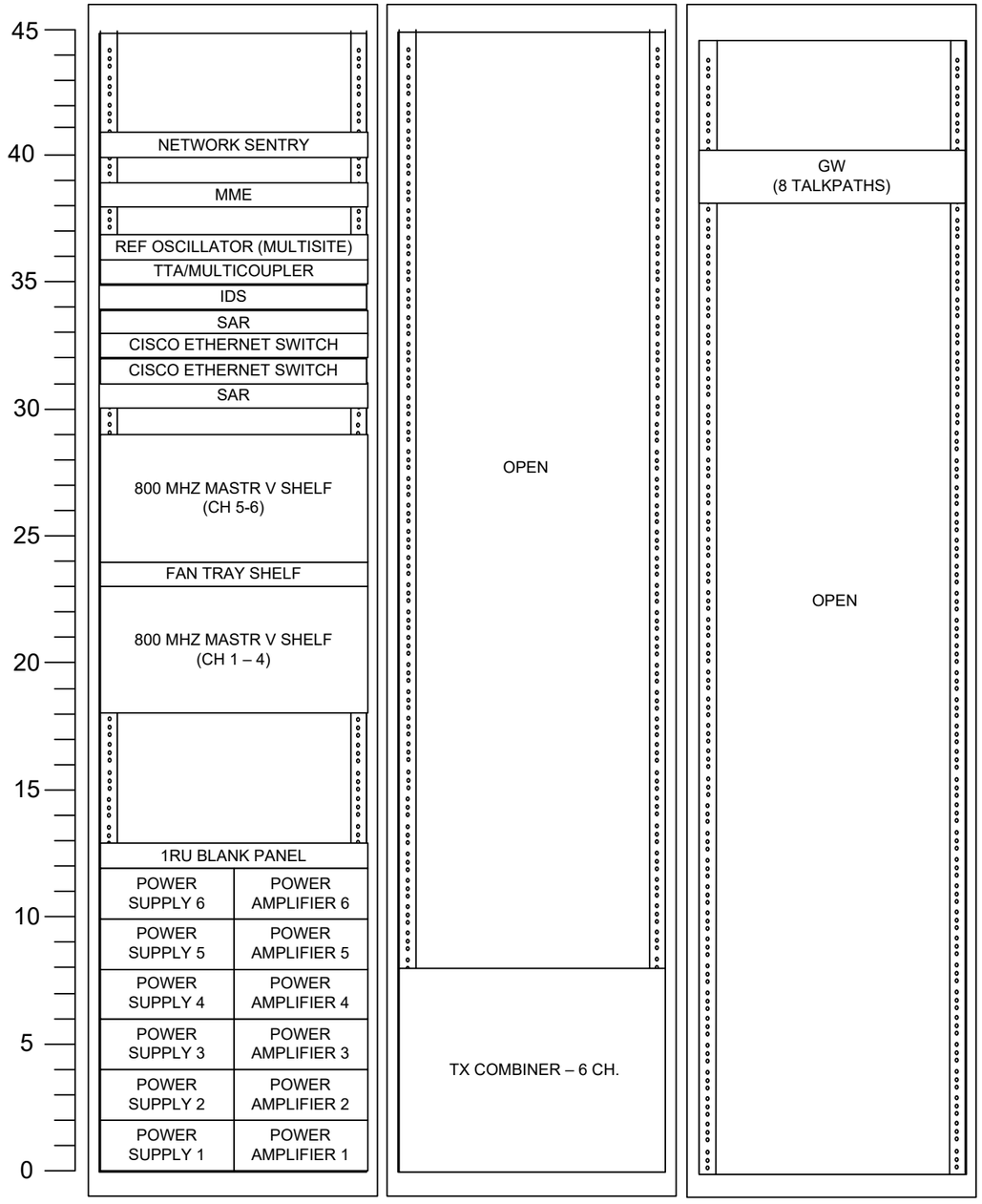
P25 Phase 2 Multisite Rack-up
3 and 4 channels



NOTES:
(1) THIS IS A REPRESENTATIVE DRAWING. INSTALLED EQUIPMENT AND RACKUP TO BE DETERMINED DURING FINAL SYSTEM DESIGN.
(2) THE INTEROPERABILITY RACK IS ONLY APPLICABLE FOR WASHOE COUNTY.
(3) DISTRIBUTION PANELS ARE INSTALLED ON THE BACK OF THE RACKS, NOT SHOWN.

HARRIS Communication Systems Division Public Safety & Professional Communications	CRM# 16CS02712
PRELIMINARY ENGINEERING SKETCH COMPANY CONFIDENTIAL	MULTI-SITE RACK-UP 3 & 4 CHS
PREPARED BY: A. OGDEN	
DATE: 7/25/2018	Nevada Shared Radio System
SKETCH #: 16CS02712	SHEET # 15 OF 21

P25 Phase 2 Multisite Rack-up
5 and 6 channels



NOTES:

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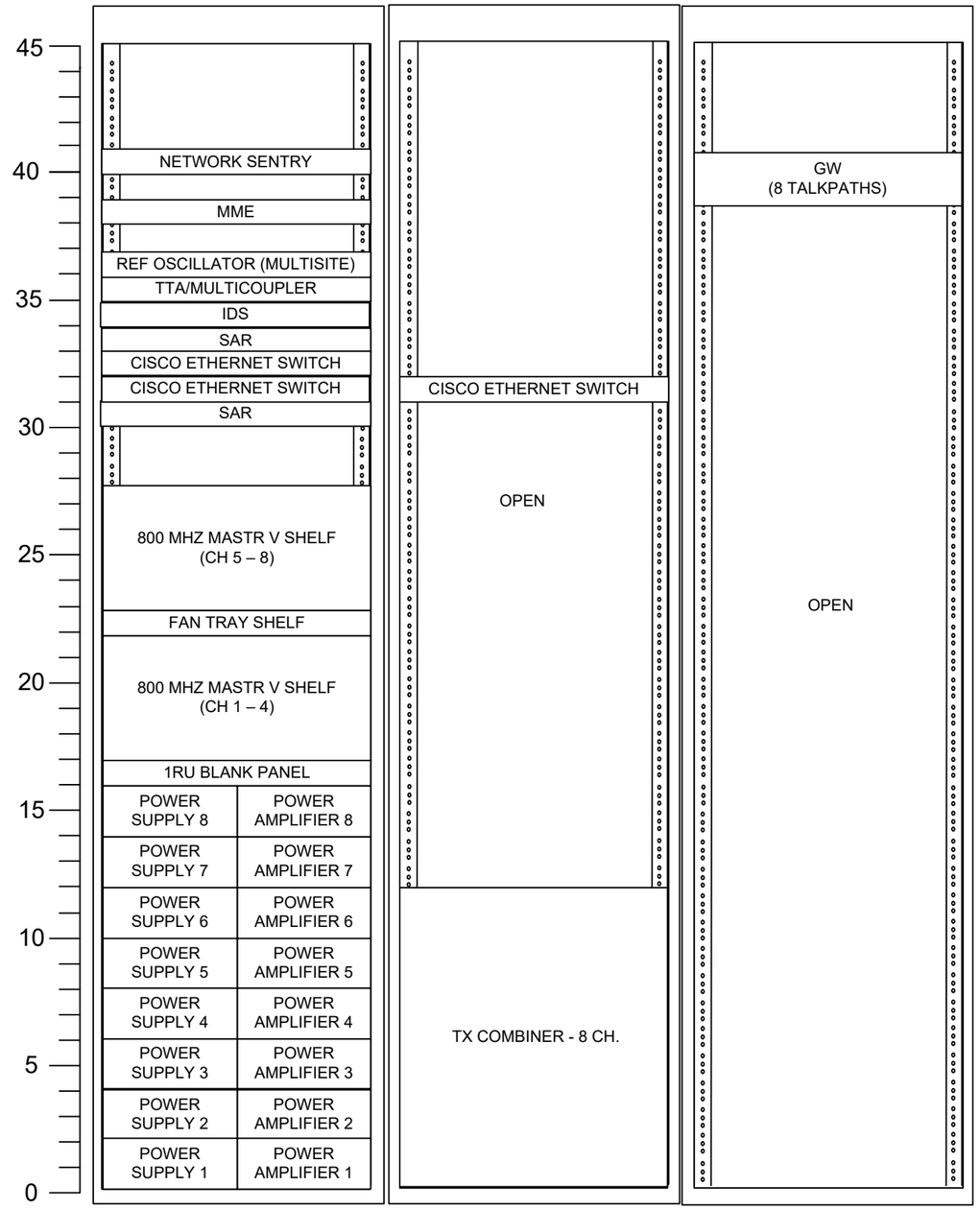
(2) THE INTEROPERABILITY RACK IS ONLY APPLICABLE FOR WASHOE COUNTY.
(3) DISTRIBUTION PANELS ARE INSTALLED ON THE BACK OF THE RACKS, NOT SHOWN.

HARRIS — Communication Systems Division, Public Safety & Professional Communications	CRM# 16CS02712
PRELIMINARY ENGINEERING SKETCH COMPANY CONFIDENTIAL	MULTI-SITE RACK-UP 5 & 6 CHS
PREPARED BY: A. OGDEN	
DATE: 7/25/2018	Nevada Shared Radio System
SKETCH #: 16CS02712	SHEET # 16 OF 21

P25 Phase 2 Multisite Rack-up
7 and 8 channels



NOTES:

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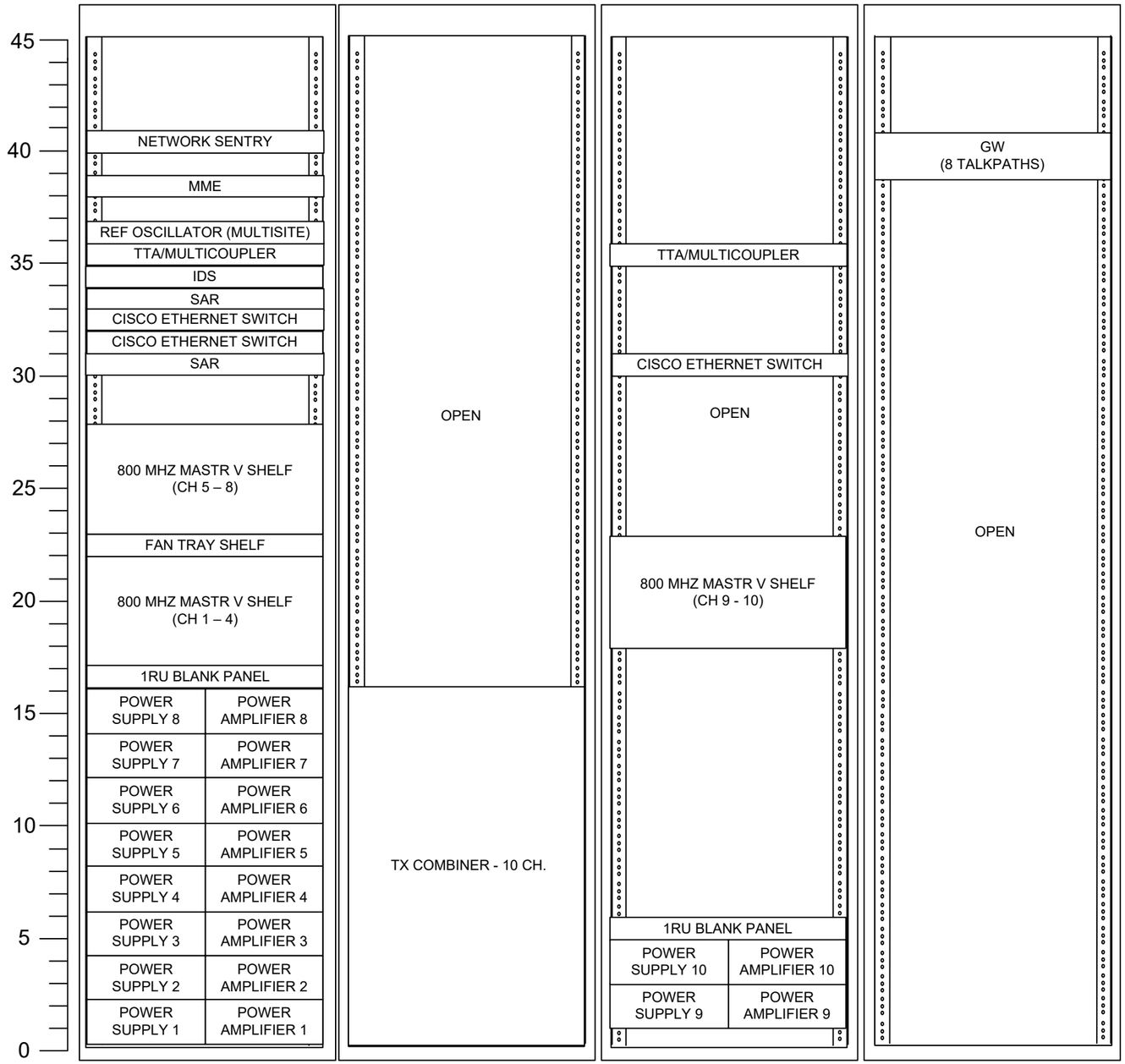
(2) THE INTEROPERABILITY RACK IS ONLY APPLICABLE FOR WASHOE COUNTY.
(3) DISTRIBUTION PANELS ARE INSTALLED ON THE BACK OF THE RACKS, NOT SHOWN.

HARRIS Communication Systems Division Public Safety & Professional Communications	CRM# 16CS02712
PRELIMINARY ENGINEERING SKETCH COMPANY CONFIDENTIAL	MULTI-SITE RACK-UP 7 & 8 CHS
PREPARED BY: A. OGDEN	
DATE: 7/25/2018	Nevada Shared Radio System
SKETCH #: 16CS02712	SHEET # 17 OF 21

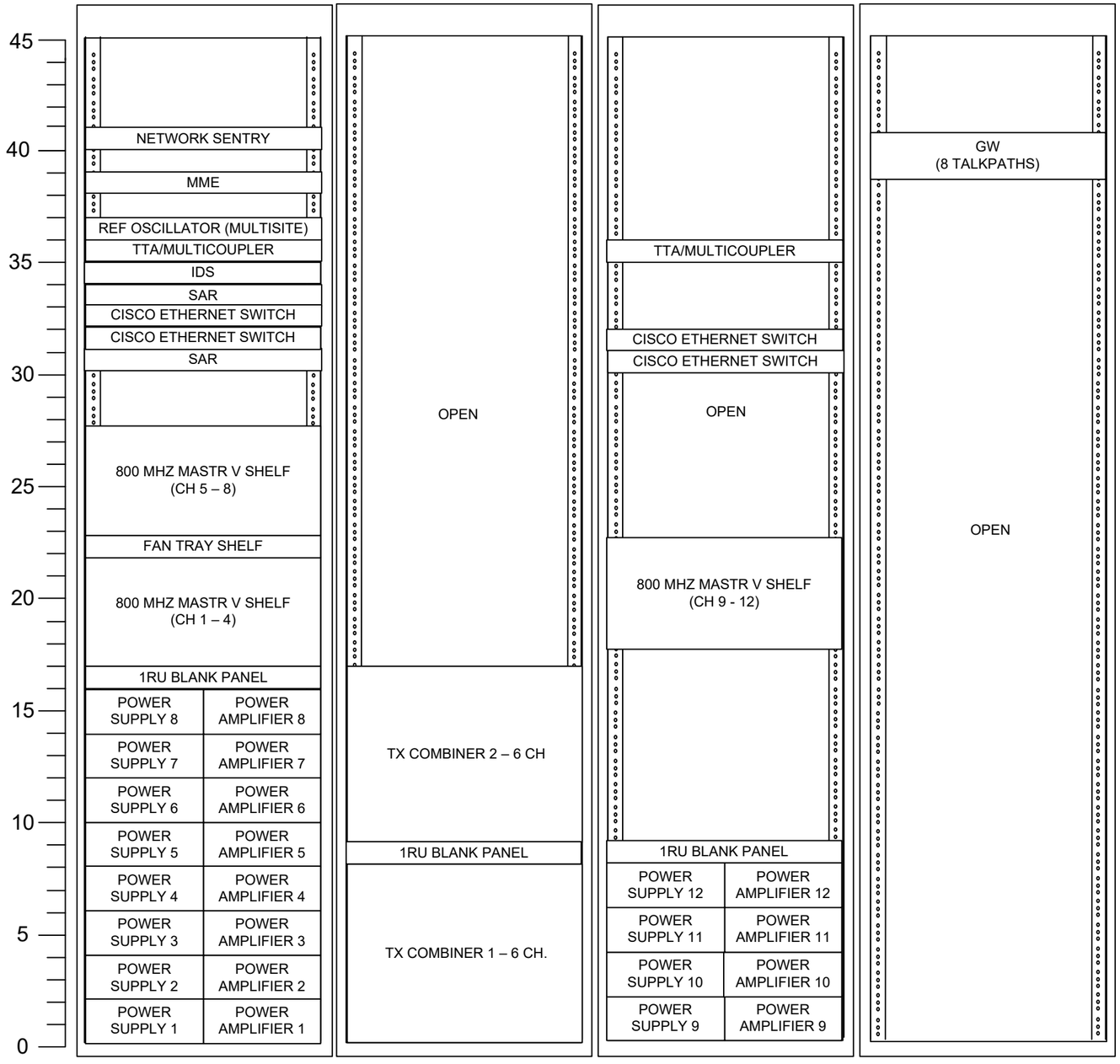
P25 Phase 2 Multisite Rack-up
10 channels



NOTES:
(1) THIS IS A REPRESENTATIVE DRAWING. INSTALLED EQUIPMENT AND RACKUP TO BE DETERMINED DURING FINAL SYSTEM DESIGN.
(2) THE INTEROPERABILITY RACK IS ONLY APPLICABLE FOR WASHOE COUNTY.
(3) DISTRIBUTION PANELS ARE INSTALLED ON THE BACK OF THE RACKS, NOT SHOWN.

HARRIS — Communication Systems Division, Public Safety & Professional Communications	CRM# 16CS02712
PRELIMINARY ENGINEERING SKETCH COMPANY CONFIDENTIAL	MULTI-SITE RACK-UP 10 CHS
PREPARED BY: A. OGDEN	
DATE: 7/25/2018	Nevada Shared Radio System
SKETCH #: 16CS02712	SHEET # 18 OF 21

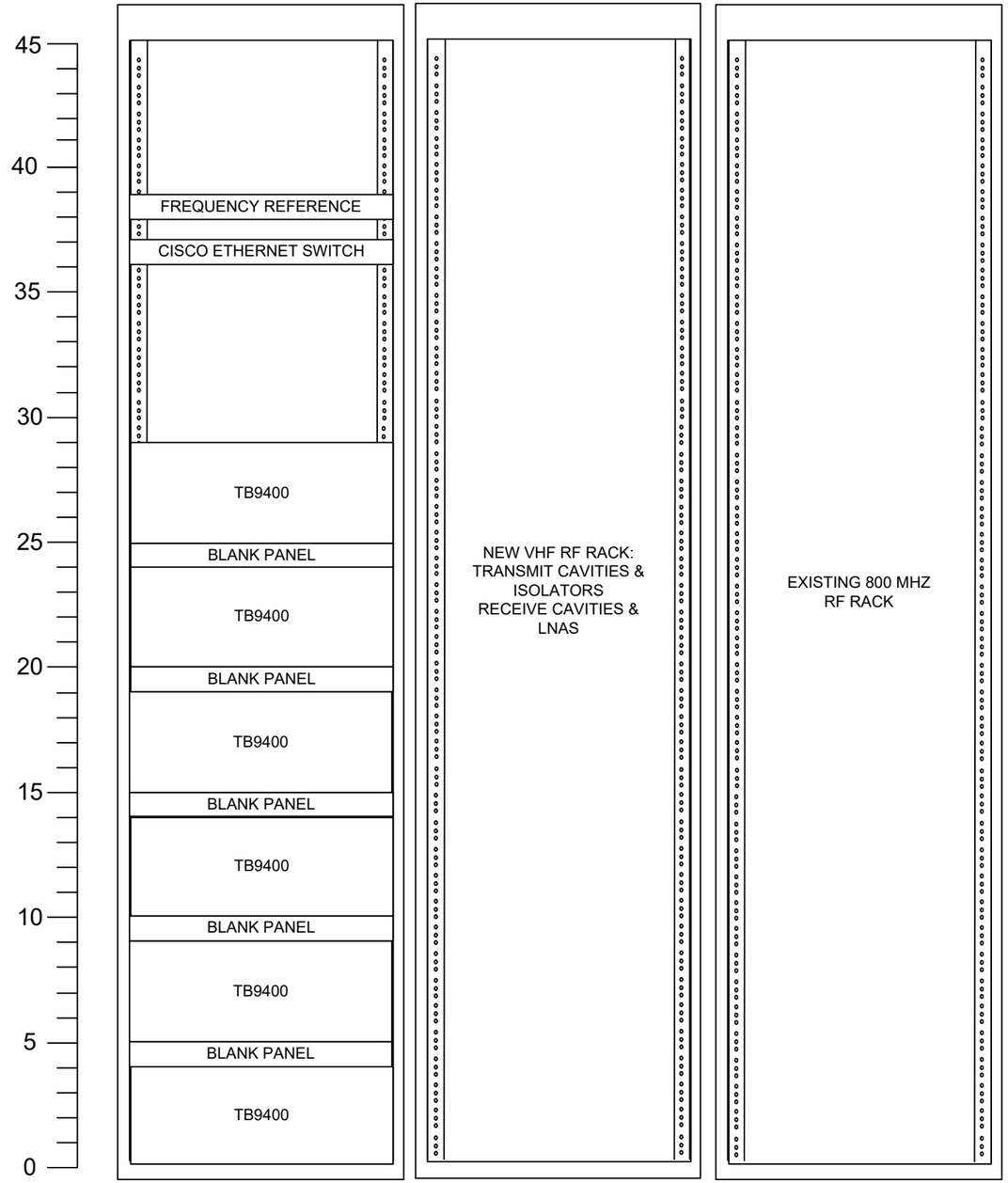
P25 Phase 2 Multisite Rack-up
12 channels



NOTES:
(1) THIS IS A REPRESENTATIVE DRAWING. INSTALLED EQUIPMENT AND RACKUP TO BE DETERMINED DURING FINAL SYSTEM DESIGN.
(2) THE INTEROPERABILITY RACK IS ONLY APPLICABLE FOR WASHOE COUNTY.
(3) DISTRIBUTION PANELS ARE INSTALLED ON THE BACK OF THE RACKS, NOT SHOWN.

HARRIS — Communication Systems Division, Public Safety & Professional Communications	CRM# 16CS02712
PRELIMINARY ENGINEERING SKETCH COMPANY CONFIDENTIAL	MULTI-SITE RACK-UP 12 CHS
PREPARED BY: A. OGDEN	
DATE: 7/25/2018	Nevada Shared Radio System
SKETCH #: 16CS02712	SHEET # 19 OF 21

NCRN – NDOT ONLY
VHF/800 MHz Cross Band Repeaters Site



NOTES:

(1) THIS IS A REPRESENTATIVE DRAWING. INSTALLED EQUIPMENT AND RACKUP TO BE DETERMINED DURING FINAL SYSTEM DESIGN.
(2) THE NCRN RACK IS ONLY APPLICABLE TO NDOT.
(3) THE NCRN SITES WILL REUSE THE EXISTING 800 MHZ EDACS ANTENNA SYSTEM ONCE DECOMMISSIONED, EXCEPT FOR POITO & PEAVINE, WHICH WILL USE THE NEW 800 MHZ P25 ANTENNA SYSTEM.
(4) DISTRIBUTION PANELS ARE INSTALLED ON THE BACK OF THE RACKS, NOT SHOWN.

HARRIS — Communication Systems Division, Public Safety & Professional Communications	CRM# 16CS02712
PRELIMINARY ENGINEERING SKETCH COMPANY CONFIDENTIAL	NCRN - NDOT ONLY
PREPARED BY: A. OGDEN	
DATE: 7/25/2018	Nevada Shared Radio System
SKETCH #: 16CS02712	SHEET # 20 OF 21

NSRS Dispatch Centers

Multiple Dispatch Locations (NDOT)

Control Stations*
(Rack Mounted)

Symphony Console

Redundant
Routers

NSRS Demarcation Point

	New	Existing
FAST Center	2	11
Elko	0	2
Elko Radio Shop	1	0
Reno	0	2
Reno Radio Shop	1	0
NHP Carson EOC	0	5
Washington Yard	1	0
Carson City Hot Springs	1	0
LCB	1	0
Tonopah Radio Shop	1	0
Winnemucca Radio Shop	1	0

NSRS Provided
Backhaul

Multiple Dispatch Locations (WC)

Control Stations*
(Rack Mounted)

Symphony Console

Redundant
Routers

NSRS Demarcation Point

	New	Existing
Washoe/Reno	1	15
Sparks	0	6
WC Detention	2	0
WC Court Complex	1	0
WCSD	6	1
Reno Airport	0	4
WCRCS	1	1

NSRS Provided
Backhaul

Harris VIDA Network

NSRS Provided
Backhaul

NSRS Demarcation Point

Multiple Dispatch Locations (NVE)

Redundant
Routers

Symphony Console

Control Stations*
(Rack Mounted)

	New	Existing
Beltway	4	9
Ryan Center	2	0
Ohm	0	0
General Office Building (GOB)	0	6

Legend

NDOT
NV Energy
Washoe County

***Control Stations with Control Station Combiners**

HARRIS — Communication Systems Division, Public Safety & Professional Communications	CRM# 16CS02712
PRELIMINARY ENGINEERING SKETCH COMPANY CONFIDENTIAL	CONSOLES
PREPARED BY: A. OGDEN	
DATE: 7/25/2018	Nevada Shared Radio System
SKETCH #: 16CS02712	SHEET # 21 OF 21

Responsibility Matrix

Detailed Design Review (DDR) Responsibility Matrix

The Harris Team uses the information obtained during the Kick-Off Meeting, Preliminary Design Review, site surveys, and regulatory and engineering documentation to deliver the final system design at the DDR. This will be updated per regional cutover.

The Harris Team presents design drawings and documentation during the DDR with NDOT.

Figure 1. Detailed Design Review Responsibility Matrix

Tasks	Harris	NDOT
Prepare for Detailed Design Review		
Assemble project team and travel to the NDOT location	X	
Assemble NDOT team for Kick-Off Meeting		X
Provide location in appropriate conference room or training facility		X
Present preliminary information on sites and design	X	
Provide information and status on sites, leases, etc.		X
Provide a team and propose a schedule for site surveys	X	
Arrange access to sites and confirm site survey schedule		X
Provide site-knowledgeable personnel (customer and site owner reps, as appropriate) to accompany the project team on site surveys		X
Conduct site surveys	X	
Provide site plans and applicable electrical and layout plans for existing sites		X
Provide up-to-date tower and foundation drawings along with a current mapping of installed antennas and cabling		X
Perform grounding analyses	X	
Perform tower structural analyses	X	
Develop required system drawings	X	
Develop network plans and IP backhaul requirements	X	
Develop tower antenna placement plans	X	

Tasks	Harris	NDOT
Develop frequency plans	X	
Develop coverage maps	X	
Develop site electrical loads	X	
Develop preliminary cutover plan	X	
Develop formal project schedule	X	
Prepare Final Acceptance Test Plan (FATP) documents	X	
Prepare one set of FCC License applications for NDOT's submission	X	
Submit FCC license applications and pay requisite fees		X
Arrange for site lease for any non-customer-owned sites		X
Detailed Design Review Deliverables		
System block diagrams	X	
List of deliverable equipment for each site	X	
Network connection plan and backhaul requirements	X	
Tower antenna placement drawings	X	
Antenna system drawings	X	
Coverage prediction maps	X	
Frequency plans	X	
Combiner plans	X	
Greenfield site plot drawings (after site surveys have been performed)	X	
Shelter floor plan drawings	X	
Rack elevation drawings	X	
AC power and BTU requirements	X	
Preliminary Cutover Plan	X	
Final Acceptance Test Plan (FATP)	X	
Project schedule	X	
FCC licensed frequencies that meet contour limits and fulfill the frequency plan, in accordance with the Project Schedule	X	
Final staging acceptance test plan (SATP)	X	
Final coverage acceptance test plan (CATP)	X	

Tasks	Harris	NDOT
Fleet map plan	X	
Training plan	X	
Detailed Design Review		
Provide deliverables for review	X	
Review documents		X
Provide location for DDR meeting		X
Approve the design following DDR meeting (20 business days)		X

Manufacturing and Staging Responsibility Matrix

The responsibility matrix shown in Figure 2 provides the staging activities that the Harris Team is responsible for and those activities that are the responsibility of NDOT. Each region of the State system repeats the manufacturing, staging, and factory acceptance test (FAT) processes to meet the dates on the project schedule.

Figure 2. System Integration and Test - Staging Responsibility Matrix

Tasks	Harris	NDOT
Insert equipment delivery dates into the material planning system per region	X	
Place orders with the factory per region	X	
Place orders with key suppliers per region	X	
Manufacture all infrastructure equipment per region	X	
Assemble equipment in staging area on a per site basis	X	
Provide appropriate personnel to participate in/witness each region's FAT test		X
Run FAT per region	X	
Provide approval for each FAT test and authorize the region to be shipped (within 5 business days)		X

Shipping, Warehousing, and Inventory Responsibility Matrix

Figure 3 shows the shipping and inventory activities that the Harris Team is responsible for and those activities that the Team believes are the responsibilities of NDOT that will be repeated for

each region.

Figure 3. Shipping & Inventory Responsibility Matrix

Tasks	Harris	NDOT
Break down equipment and ship to storage area	X	
Provide temporary storage in the state of Nevada	X	
Inventory equipment	X	
Validate Harris equipment inventory		X
Sort equipment in preparation for site delivery and installation	X	

System Installation Responsibility Matrix

Figure 4 provides a system installation responsibility matrix for antenna systems and infrastructure equipment, that is repeated for each region.

Figure 4. System Infrastructure Installation Responsibility Matrix

Tasks	Harris	NDOT
Deliver equipment to each site	X	
Install equipment, connect to ground system and apply power	X	
Connect all RF cables	X	
Interface to network, verify network connectivity	X	
Set all P25 system levels and parameters	X	
Connect all P25 system alarms	X	

System Optimization Responsibility Matrix

Harris will conduct a preliminary Acceptance Test to determine that the systems are fully optimized and ready for the Acceptance Test with NDOT. Figure 5 describes those tasks to be performed in System Optimization for each Region.

Figure 5. System Optimization Matrix

Tasks	Harris	NDOT
Prepare all installed sites for site inspections	X	

Tasks	Harris	NDOT
Verify microwave/backhaul system is functional and meets reliability specifications		X
Provide frequencies to use for optimization and testing (if frequencies are currently in use in existing system)		X
Verify P25 levels and parameters are set	X	
Verify P25 alarm and system monitoring system are operational	X	
Verify system database is installed and operating correctly	X	
Verify proper dispatch operation	X	
Verify proper P25 functional operation	X	
Verify proper network switching operation	X	
Verify proper mutual aid operation	X	
Coordinate testing of the desired interoperability channels		X
Verify proper interoperability from gateways	X	

Final Acceptance Testing Responsibility Matrix

Figure 6 provides a detailed listing of those Final Acceptance Testing activities performed by Harris, and those activities that NDOT will perform for each region.

Figure 6. Acceptance Testing Responsibility Matrix

Tasks	Harris	NDOT
Provide appropriate team members to participate in acceptance tests	X	X
Inspect each RF site, noting discrepancies on the punch list	X	
Inspect each dispatch center, noting discrepancies on the punch list	X	
Inspect each network center, noting discrepancies on the punch list	X	
Submit site inspection results	X	
Approve site inspection results within 15 business days		X
Perform functional ATP on radio system, dispatch consoles, network monitoring, and user radios	X	
Submit functional ATP results	X	
Approve functional ATP results (within 15 business days)		X

Tasks	Harris	NDOT
Provide team members to participate in coverage tests		X
Provide test vehicles and drivers for acceptance testing	X	
Provide test radios for automatic coverage tests	X	
Perform automated coverage test of P25 per system contract	X	
Provide test radios for voice quality test	X	
Perform voice quality test of P25 per system contract	X	X
Submit coverage ATP results	X	
Approve coverage ATP results		X
Cutover users to the new P25 system	X	X
Decommission legacy system	X	

User Radio Equipment Responsibility Matrix

All mobile radio installations will be closely coordinated with NDOT and participating user agencies, to minimize disruption to their operation, and to reduce out-of-service and unproductive time. Figure 7 describes the activities in User Radio Equipment Implementation performed by Harris, and those activities that NDOT will perform for each region.

Figure 7. User Radio Equipment Responsibility Matrix

Tasks	Harris	NDOT
Program and distribute Harris portable units with accessories	X	
Provide central facilities for regional mobile vehicle installation		X
Provide vehicles to meet the project schedule timeline		X
Program and install Harris mobile units	X	
Provide pre- and post- installation vehicle assessments, presenting installation documentation for customer acceptance for each vehicle	X	
Provide a temporary storage facility for equipment that Harris removes from the vehicles	X	
Provide a representative to review installation documentation and provide acceptance for each vehicle		X

General and Site Development Responsibility Matrices

The general responsibility matrix describes the general project responsibilities of both parties that are not associated with any specific site.

Figures 8 thru 11 represent the general and site development responsibilities if NDOT chooses to issue Harris a change order to perform the site development and site civil requirements .

Figure 8. General Responsibility Matrix

Tasks	Harris	NDOT
Coordinate with federal, state, and local government agencies, as required		X
Provide access to all buildings and sites, including temporary ID badges for Harris project team		X
Provide parking permits for Harris project team for any restricted parking areas		X
Provide adequate road access for delivery vehicles		X
Arrange for temporary parking to off-load equipment at all buildings and sites		X
Clean up site and remove all installation debris	X	
Remove any hazardous material found on site		X
Ensure that no utility transformers additions or upgrades will be required to provide the adequate AC power needed for each site		X
Develop sites and install civil materials in accordance with industry and Harris recommended standards	X	
Provide final backhaul requirements to the NDOT	X	
Provide backhaul which meets the final backhaul		X

requirements provided by Harris

The site responsibility matrices below define the responsibilities of both parties for the implementation of the P25 Project.

Figure 9. Existing Customer-Owned Sites Responsibility Matrix

Tasks	Harris	NDOT
Customer-Owned Site Tasks		
Obtain any necessary zoning approval for site changes		X
Perform physical path surveys for each microwave path		X
Provide existing site plans		X
Perform grounding analysis	X	
Provide NDOT site survey results reports and recommendations	X	
Existing Tower		
Provide available current tower and foundation drawings along with a current mapping of installed antennas and cabling		X
Identify specific tower attachment points to mount new antennas per the system design	X	
Confirm availability of tower attachment points for Harris antennas		X
Perform tower analysis on existing tower, and provide results at DDR. If tower fails load analysis, Harris can provide quotes to strengthen tower (if possible), replace the tower, or provide site acquisition services.	X	

Tasks	Harris	NDOT
Strengthen or replace tower (if required by structural analysis results, Harris will replace tower if requested through the change order process)		X
Provide space on existing tower to mount new system antennas at Harris specified locations		X
Ensure adequate space is available on cable ice bridge, and tower cable ladders, to support new cable runs		X
Install new antenna(s) using appropriate 6 ft. side arms and mounting hardware	X	
Install antenna coax, connectors and jumpers, using cable clamps to properly secure cable to tower, and add grounding kits at the top, bottom, and on ice bridge	X	
If required by the system design, Harris will install a new tower top amplifier	X	
Install antenna lightning protection devices on each transmission line LMR run after it enters shelter via cable entry port; ground device to main ground bus bar	X	
If required, install new microwave dish(es) on pipe mounts with anti-sway kits		X
Install new microwave waveguide or coaxial feed lines, secure to cable ladder(s), and add grounding kits at the top, bottom, and on ice bridge		X
Tag and identify each new antenna line	X	
Sweep test each new antenna line in accordance with Harris' "Transmission Line Analysis (Antenna	X	

Tasks	Harris	NDOT
Sweep) Procedure, and maintain copies in site logbook		
Existing Shelter		
Provide floor space in existing RF shelter for new equipment racks used in the new design		X
Provide adequate shelter/equipment room utility AC electrical power, single-point ground system HVAC, and backup generator power		X
If existing entrance ports are not available NDOT will provide Harris with a change order to provide new cable entry ports		X
Upgrade existing interior ground system (requires change order)	X	
Provide additional cable ladder for new equipment row	X	
If needed, Harris will prepare and submit electrical permits on behalf of the customer	X	
Install new DC power plant and wire to racks if required	X	
Provide floor space at the dispatch center and network center for new system equipment		X
Provide backup power (UPS) for NSC		X
Provide backup power (UPS) for consoles		X
Provide demarcation blocks for connection to existing legacy radios to be used in interoperability system		X

Figure 10. Greenfield Site Responsibility Matrix

Tasks	Harris	NDOT
Obtain land through lease or purchase for use in the new radio project		X
Perform physical path surveys for each new microwave path		X
Provide NDOT site survey results report and recommendations	X	
Stake out the desired location for tower, shelter, generator, and compound	X	
After a change order has been issued and assurances have been made that this site can be developed, Harris will have an architectural firm develop site plot drawings of compound showing new tower, shelter, generator, and fuel tank locations	X	
Obtain all required zoning approvals to construct the site		X
Prepare FAA/FCC applications for new tower	X	
Submit FAA/FCC forms for new tower	X	
Prepare new tower NEPA/SHPO environmental studies and THPO filings	X	
Arrange and pay for electric power/service at each site getting a new shelter or improved electrical service. Terminate AC power within 50 ft. of new shelter. Provide utility transformers, if necessary, to provide the required AC power.		X

Tasks	Harris	NDOT
Prepare and submit construction permits for new tower or shelter (requires change order)	X	
Prepare and submit electrical permits	X	
If required, create an access road that will be 10 ft. wide. (pricing for access road will be determined after site surveys are complete)	X	
Schedule soil boring test for tower leg foundations in accordance with TIA-222 standards for new towers, and review results with (NDOT)	X	
If soil boring test results indicate a foundation design is required to address other than typical soil conditions. Harris will submit a site-specific foundation design, and pricing change request	X	
Level land, construct silt fences, and remove weeds and brush	X	
Construct tower foundation	X	
Erect new tower (type and height to be determined after site surveys)	X	
Construct full-slab shelter foundation	X	
Transport, off-load and set new shelter (shelter type and generator size will be determined after site surveys)	X	
Trench in 200A single-phase 240V AC electrical service to new shelter	X	
Provide new cable entry ports	X	
Construct generator foundation (if required)	X	
Transport, off-load, and set new generator on pad	X	

Tasks	Harris	NDOT
Trench in generator electrical service and control circuits to shelter-mounted ATS	X	
Construct generator LP-fuel tank pad (if required)	X	
Transport, off-load, and set new LP-fuel tank on pad	X	
Trench in fuel lines between tank and generator	X	
Fill generator fuel tank (first fill)	X	
Provide factory generator technician to provide first start service	X	
Install new perimeter fence with gate (if required)	X	
Construct exterior ground system for tower, shelter, generator, fuel tank, and fence corner posts	X	
Spread new compound gravel/crushed stone	X	
Construct new cable ice bridge for sites with new towers and/or shelters	X	
Supply copper ground plate for mounting on tower to ground all coaxial cables as they leave the tower on the cable ice bridge	X	
Install new LMR antenna(s), using appropriate 6 ft. side arms and mounting hardware	X	
Install LMR antenna coax, connectors, and jumpers, using cable clamps to properly secure cable to tower and add grounding kits at the top, bottom, and on ice bridge.	X	
Install new tower top amplifier	X	

Tasks	Harris	NDOT
Install antenna lightning protection devices on each LMR run after it enters shelter via cable entry port; ground device to main ground bus bar	X	
Install new microwave dish(es) on pipe mounts with anti-sway kits		X
Install new microwave waveguide or coaxial feed lines, secure to cable ladder(s), and add grounding kits at the top, bottom, and on ice bridge		X
Tag and identify each new antenna line	X	
Sweep test each new antenna line in accordance with Harris' "Transmission Line Analysis (Antenna Sweep) Procedure, and maintain copies in site logbook	X	
Install new DC power plant and wire to racks	X	

Figure 11. Existing Collocation Sites Responsibility Matrix

Tasks	Harris	NDOT
Collocated Site Tasks		
Arrange for access to third party collocated site		X
Negotiate and obtain lease (or modify existing lease) for third party co-location site, ensuring the site lease includes required space on the tower, cable ice bridge, and tower cable ladders to support new cable runs, space-in compound for new shelter, generator, and fuel tank		X
Ensure co-location agreements address site compound space requirements to include confirmation that no subsurface obstructions preclude running conduits for power or leased circuits, as well as		X

Tasks	Harris	NDOT
running lines between (Informal NDOT)'s shelters, generators, and fuel tanks		
Arrange with third party site owner to perform tower analysis	X	
Perform physical path surveys for each microwave path		X
Provide existing site plans		X
Perform grounding analysis	X	
Provide site survey and grounding results report and recommendations	X	
Existing Tower		
Provide current tower and foundation drawings, from site owner, along with a current mapping of installed antennas and cabling		X
Identify specific tower attachment points to mount new antennas per the system design	X	
Confirm availability of tower attachment points for Harris antennas		X
Perform tower analysis on existing tower, and provide results at DDR. If tower fails load analysis, Harris can provide quotes to strengthen tower (if possible), replace the tower, or provide site acquisition services.	X	
Strengthen or replace tower (if required by structural analysis results, Harris will replace if requested by change order)		X
Provide space on existing tower to mount new system		X

Tasks	Harris	NDOT
antennas at Harris specified locations (defined in site lease)		
Ensure adequate space is available on cable ice bridge, and tower cable ladders, to support new cable runs		X
Install new antenna(s) using appropriate 6 ft. side arms and mounting hardware	X	
Install antenna coax, connectors and jumpers, using cable clamps to properly secure cable to tower, and add grounding kits at the top, bottom, and on ice bridge	X	
If required by the system design, Harris will install a new tower top amplifier	X	
Install antenna lightning protection devices on each transmission line LMR run after it enters shelter via cable entry port; ground device to main ground bus bar	X	
If required, install new microwave dish(es) on pipe mounts with anti-sway kits		X
Install new microwave waveguide or coaxial feed lines, secure to cable ladder(s), and add grounding kits at the top, bottom, and on ice bridge		X
Tag and identify each new antenna line	X	
Sweep test each new antenna line in accordance with Harris' "Transmission Line Analysis (Antenna Sweep) Procedure, and maintain copies in site logbook	X	
New Shelter		
Stake out the desired location for new shelter	X	

Tasks	Harris	NDOT
Have an architectural firm develop site compound plot drawings of compound showing tower, new shelter, generator, and fuel tank locations	X	
Obtain any required zoning approvals		X
Prepare and submit construction permits for new shelter	X	
Arrange for and pay for electric power/service at each site getting a new shelter or improved electrical service. Terminate AC power within 50 ft. of new shelter. Provide utility transformers, if necessary, to provide the required AC power.	X	
Prepare and submit electrical permits	X	
Level land, construct silt fences, and remove weeds and brush	X	
Construct full-slab shelter foundation	X	
Transport, off-load, and set new shelter	X	
Trench in 200A single phase 240 V AC electrical service to new shelter	X	
Construct exterior ground system for new shelter and tie into existing tower, generator, fuel tank, and fence corner posts ground	X	
Install new DC power plant and wire to racks	X	
New Generator		
Stake out the desired location for new generator and LP tank pad	X	
Have an architectural firm develop site compound plot drawings of compound showing tower, shelter, new	X	

Tasks	Harris	NDOT
generator, and LP tank locations		
Obtain all required zoning permits and approvals		X
Prepare and submit construction permits for new generator	X	
Arrange and pay for electric power/service at each site getting a new shelter or improved electrical service. Terminate AC power within 50 ft. of new shelter. Provide utility transformers, if necessary, to provide the required AC power.		X
Prepare and submit electrical permits	X	
Level land, construct silt fences, and remove weeds and brush	X	
Construct/pour generator & fuel tank pads (if required)	X	
Transport, off-load, and set new generator on pad	X	
Trench in generator electrical service and control circuits to shelter-mounted ATS	X	
Transport, off-load, and set new LP-fuel tank on pad	X	
Trench in fuel lines between tank and generator	X	
Ground generator and fuel tank to tower/shelter ground system	X	
Fill generator fuel tank (first fill)	X	
Provide factory generator technician for first-start service	X	
Expand Compound		
Have an architectural firm develop site compound plot drawings of compound showing tower, shelter,	X	

Tasks	Harris	NDOT
generator, and LP tank locations		
Level land, construct silt fences, and remove weeds and brush	X	
Install new. perimeter fence with gate	X	
Expand existing compound	X	
Expand existing compound fence line	X	
Tie fence corner posts back to tower/shelter exterior ground system	X	
Spread new compound gravel/crushed stone	X	

Figures 12 thru 15 represent the general and site development responsibilities if NDOT chooses to self-perform the site development and site civil requirements.

Figure 12. General Responsibility Matrix

Tasks	Harris	NDOT
Coordinate with federal, state, and local government agencies, as required		X
Provide access to all buildings and sites, including temporary ID badges for Harris project team		X
Provide parking permits for Harris project team for any restricted parking areas		X
Provide adequate road access for delivery vehicles		X
Arrange for temporary parking to off-load equipment at all buildings and sites		X
Clean up site and remove all installation debris	X	
Remove any hazardous material found on site		X

Ensure that no utility transformers additions or upgrades will be required to provide the adequate AC power needed for each site		X
Develop sites and install civil materials in accordance with industry and Harris recommended standards		X
Provide final backhaul requirements to the NDOT	X	
Provide backhaul which meets the final backhaul requirements provided by Harris		X

The site responsibility matrices below define the responsibilities of both parties for the implementation of the P25 Project.

Figure 13. Existing Customer-Owned Sites Responsibility Matrix

Tasks	Harris	NDOT
Customer-Owned Site Tasks		
Obtain any necessary zoning approval for site changes		X
Perform physical path surveys for each microwave path		X
Provide existing site plans		X
Perform grounding analysis	X	
Provide NDOT site survey results reports and recommendations	X	
Existing Tower		
Provide available current tower and foundation drawings along with a current mapping of installed antennas and cabling		X
Identify specific tower attachment points to mount	X	

Tasks	Harris	NDOT
new antennas per the system design		
Confirm availability of tower attachment points for Harris antennas		X
Perform tower analysis on existing tower, and provide results at DDR. If tower fails load analysis, Harris can provide quotes to strengthen tower (if possible), replace the tower, or provide site acquisition services.	X	
Strengthen or replace tower (if required by structural analysis results, Harris will replace tower if requested through the change order process)		X
Provide space on existing tower to mount new system antennas at Harris specified locations		X
Ensure adequate space is available on cable ice bridge, and tower cable ladders, to support new cable runs		X
Install new antenna(s) using appropriate 6 ft. side arms and mounting hardware	X	
Install antenna coax, connectors and jumpers, using cable clamps to properly secure cable to tower, and add grounding kits at the top, bottom, and on ice bridge	X	
If required by the system design, Harris will install a new tower top amplifier	X	
Install antenna lightning protection devices on each transmission line LMR run after it enters shelter via cable entry port; ground device to main ground bus bar	X	

Tasks	Harris	NDOT
If required, install new microwave dish(es) on pipe mounts with anti-sway kits		X
Install new microwave waveguide or coaxial feed lines, secure to cable ladder(s), and add grounding kits at the top, bottom, and on ice bridge		X
Tag and identify each new antenna line	X	
Sweep test each new antenna line in accordance with Harris' "Transmission Line Analysis (Antenna Sweep) Procedure, and maintain copies in site logbook	X	
Existing Shelter		
Provide floor space in existing RF shelter for new equipment racks used in the new design		X
Provide adequate shelter/equipment room utility AC electrical power, single-point ground system HVAC, and backup generator power		X
If existing entrance ports are not available NDOT will provide Harris with a change order to provide new cable entry ports		X
Upgrade existing interior ground system (requires change order)	X	
Provide additional cable ladder for new equipment row	X	
If needed, Harris will prepare and submit electrical permits on behalf of the customer	X	
Install new DC power plant and wire to racks if required (requires change order)	X	
Provide floor space at the dispatch center and		X

Tasks	Harris	NDOT
network center for new system equipment		
Provide backup power (UPS) for NSC		X
Provide backup power (UPS) for consoles		X
Provide demarcation blocks for connection to existing legacy radios to be used in interoperability system		X

Figure 14. Greenfield Site Responsibility Matrix

Tasks	Harris	NDOT
Obtain land through lease or purchase for use in the new radio project		X
Perform physical path surveys for each new microwave path		X
Provide NDOT site survey results report and recommendations	X	
Stake out the desired location for tower, shelter, generator, and compound	X	
After a change order has been issued and assurances have been made that this site can be developed, Harris will have an architectural firm develop site plot drawings of compound showing new tower, shelter, generator, and fuel tank locations	X	
Obtain all required zoning approvals to construct the site		X
Prepare FAA/FCC applications for new tower		X
Submit FAA/FCC forms for new tower		X

Tasks	Harris	NDOT
Prepare new tower NEPA/SHPO environmental studies and THPO filings		X
Arrange and pay for electric power/service at each site getting a new shelter or improved electrical service. Terminate AC power within 50 ft. of new shelter. Provide utility transformers, if necessary, to provide the required AC power.		X
Prepare and submit construction permits for new tower or shelter (requires change order)		X
Prepare and submit electrical permits		X
If required, create an access road that will be 10 ft. wide		X
Schedule soil boring test for tower leg foundations in accordance with TIA-222 standards for new towers, and review results with (NDOT)		X
If soil boring test results indicate a foundation design is required to address other than typical soil conditions. Harris will submit a site-specific foundation design, and pricing change request		X
Level land, construct silt fences, and remove weeds and brush		X
Construct tower foundation		X
Erect new tower (type and height to be determined after site surveys)		X
Construct full-slab shelter foundation		X

Tasks	Harris	NDOT
Transport, off-load and set new shelter (shelter type and generator size will be determined after site surveys)		X
Trench in 200A single-phase 240V AC electrical service to new shelter		X
Provide new cable entry ports		X
Construct generator foundation (if required)		X
Transport, off-load, and set new generator on pad		X
Trench in generator electrical service and control circuits to shelter-mounted ATS		X
Construct generator LP-fuel tank pad (if required)		X
Transport, off-load, and set new LP-fuel tank on pad		X
Trench in fuel lines between tank and generator		X
Fill generator fuel tank (first fill)		X
Provide factory generator technician to provide first start service		X
Install new perimeter fence with gate (if required)		X
Construct exterior ground system for tower, shelter, generator, fuel tank, and fence corner posts		X
Spread new compound gravel/crushed stone		X
Construct new cable ice bridge for sites with new towers and/or shelters		X
Supply copper ground plate for mounting on tower to ground all coaxial cables as they leave the tower on the cable ice bridge	X	

Tasks	Harris	NDOT
Install new LMR antenna(s), using appropriate 6 ft. side arms and mounting hardware	X	
Install LMR antenna coax, connectors, and jumpers, using cable clamps to properly secure cable to tower and add grounding kits at the top, bottom, and on ice bridge.	X	
Install new tower top amplifier	X	
Install antenna lightning protection devices on each LMR run after it enters shelter via cable entry port; ground device to main ground bus bar	X	
Install new microwave dish(es) on pipe mounts with anti-sway kits		X
Install new microwave waveguide or coaxial feed lines, secure to cable ladder(s), and add grounding kits at the top, bottom, and on ice bridge		X
Tag and identify each new antenna line	X	
Sweep test each new antenna line in accordance with Harris' "Transmission Line Analysis (Antenna Sweep) Procedure, and maintain copies in site logbook	X	
Install new DC power plant and wire to racks		X

Figure 15. Existing Collocation Sites Responsibility Matrix

Tasks	Harris	NDOT
Collocated Site Tasks		
Arrange for access to third party collocated site		X
Negotiate and obtain lease (or modify existing lease) for third party co-location site, ensuring the site lease		X

Tasks	Harris	NDOT
includes required space on the tower, cable ice bridge, and tower cable ladders to support new cable runs, space-in compound for new shelter, generator, and fuel tank		
Ensure co-location agreements address site compound space requirements to include confirmation that no subsurface obstructions preclude running conduits for power or leased circuits, as well as running lines between (Informal NDOT)'s shelters, generators, and fuel tanks		X
Arrange with third party site owner to perform tower analysis	X	
Perform physical path surveys for each microwave path		X
Provide existing site plans		X
Perform grounding analysis	X	
Provide site survey and grounding results report and recommendations	X	
Existing Tower		
Provide current tower and foundation drawings, from site owner, along with a current mapping of installed antennas and cabling		X
Identify specific tower attachment points to mount new antennas per the system design	X	
Confirm availability of tower attachment points for Harris antennas		X
Perform tower analysis on existing tower, and provide	X	

Tasks	Harris	NDOT
results at DDR. If tower fails load analysis, Harris can provide quotes to strengthen tower (if possible), replace the tower, or provide site acquisition services.		
Strengthen or replace tower (if required by structural analysis results, Harris will replace if requested by change order)		X
Provide space on existing tower to mount new system antennas at Harris specified locations (defined in site lease)		X
Ensure adequate space is available on cable ice bridge, and tower cable ladders, to support new cable runs		X
Install new antenna(s) using appropriate 6 ft. side arms and mounting hardware	X	
Install antenna coax, connectors and jumpers, using cable clamps to properly secure cable to tower, and add grounding kits at the top, bottom, and on ice bridge	X	
If required by the system design, Harris will install a new tower top amplifier	X	
Install antenna lightning protection devices on each transmission line LMR run after it enters shelter via cable entry port; ground device to main ground bus bar	X	
If required, install new microwave dish(es) on pipe mounts with anti-sway kits		X
Install new microwave waveguide or coaxial feed lines, secure to cable ladder(s), and add grounding kits at the top, bottom, and on ice bridge		X

Tasks	Harris	NDOT
Tag and identify each new antenna line	X	
Sweep test each new antenna line in accordance with Harris' "Transmission Line Analysis (Antenna Sweep) Procedure, and maintain copies in site logbook	X	
New Shelter		
Stake out the desired location for new shelter		X
Have an architectural firm develop site compound plot drawings of compound showing tower, new shelter, generator, and fuel tank locations		X
Obtain any required zoning approvals		X
Prepare and submit construction permits for new shelter		X
Arrange for and pay for electric power/service at each site getting a new shelter or improved electrical service. Terminate AC power within 50 ft. of new shelter. Provide utility transformers, if necessary, to provide the required AC power.		X
Prepare and submit electrical permits		X
Level land, construct silt fences, and remove weeds and brush		X
Construct full-slab shelter foundation		X
Transport, off-load, and set new shelter		X
Trench in 200A single phase 240 V AC electrical service to new shelter		X
Construct exterior ground system for new shelter and tie into existing tower, generator, fuel tank, and fence corner posts ground		X

Tasks	Harris	NDOT
Install new DC power plant and wire to racks		X
New Generator		
Stake out the desired location for new generator and LP tank pad		X
Have an architectural firm develop site compound plot drawings of compound showing tower, shelter, new generator, and LP tank locations		X
Obtain all required zoning permits and approvals		
Prepare and submit construction permits for new generator		X
Arrange and pay for electric power/service at each site getting a new shelter or improved electrical service. Terminate AC power within 50 ft. of new shelter. Provide utility transformers, if necessary, to provide the required AC power.		X
Prepare and submit electrical permits		X
Level land, construct silt fences, and remove weeds and brush		X
Construct/pour generator & fuel tank pads (if required)		X
Transport, off-load, and set new generator on pad		X
Trench in generator electrical service and control circuits to shelter-mounted ATS		X
Transport, off-load, and set new LP-fuel tank on pad		X
Trench in fuel lines between tank and generator		X
Ground generator and fuel tank to tower/shelter ground system		X

Tasks	Harris	NDOT
Fill generator fuel tank (first fill)		X
Provide factory generator technician for first-start service		X
Expand Compound		
Have an architectural firm develop site compound plot drawings of compound showing tower, shelter, generator, and LP tank locations		X
Level land, construct silt fences, and remove weeds and brush		X
Install new. perimeter fence with gate		X
Expand existing compound		X
Expand existing compound fence line		X
Tie fence corner posts back to tower/shelter exterior ground system		X
Spread new compound gravel/crushed stone		X

NOTE: All site development activities are optional and site development requirements for all locations will be determined after site surveys are performed. Once site development requirements are identified NDOT will have the option to submit a change order to Harris to perform the site development activities. Harris specifically excludes solar sites from the optional pricing that has been submitted.

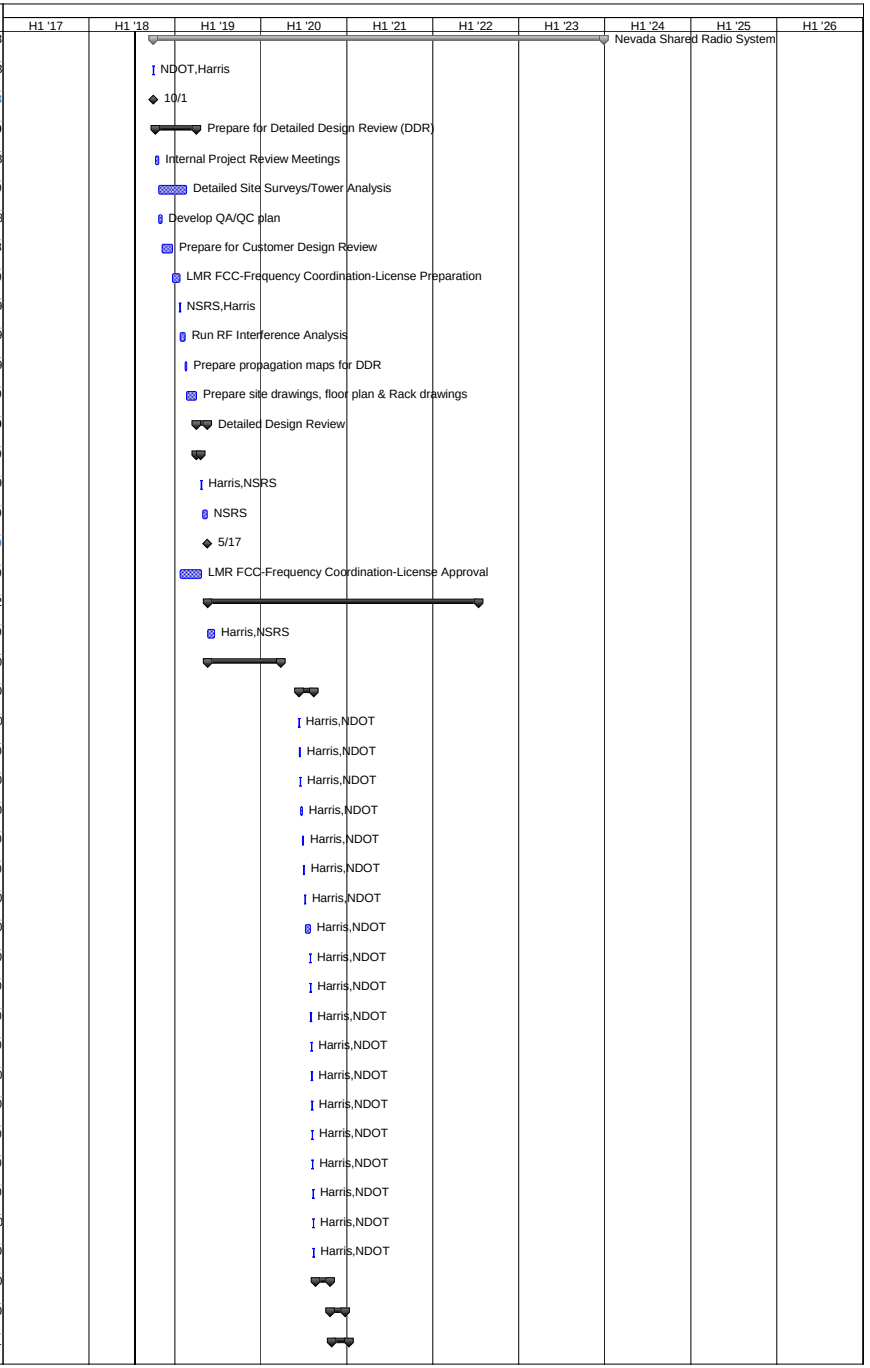
During site surveys it will be determined if any sites require non-standard vehicle access (i.e. helicopter) and will be priced accordingly through the change order process.

Nevada Shared Radio Replacement Project
RFP No. 697-16-016
State of Nevada Department of Transportation

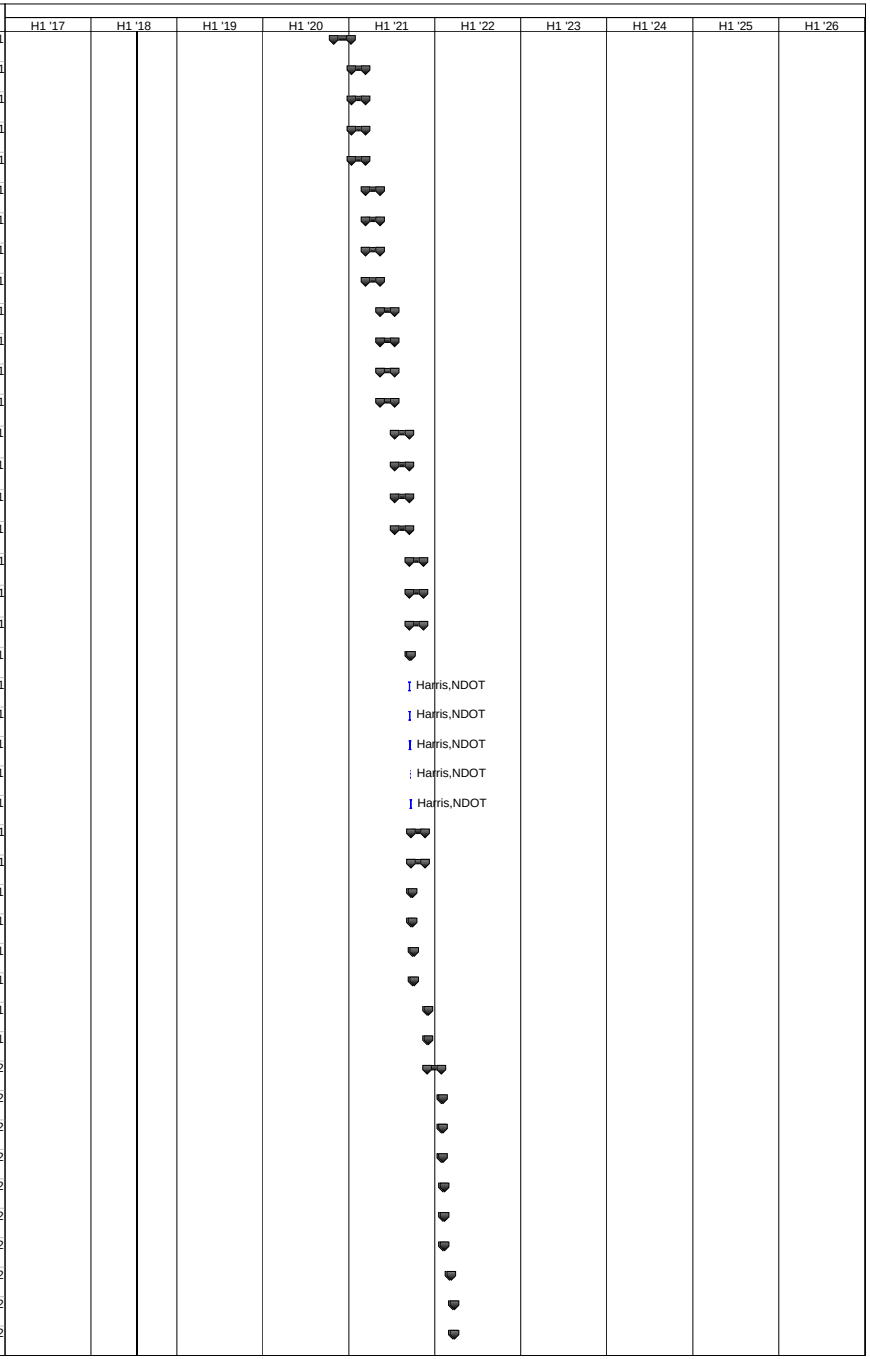
Blue = NDOT RF Site
Green = Washoe Co RF Site
Grey =NVE RF Site

July 2018

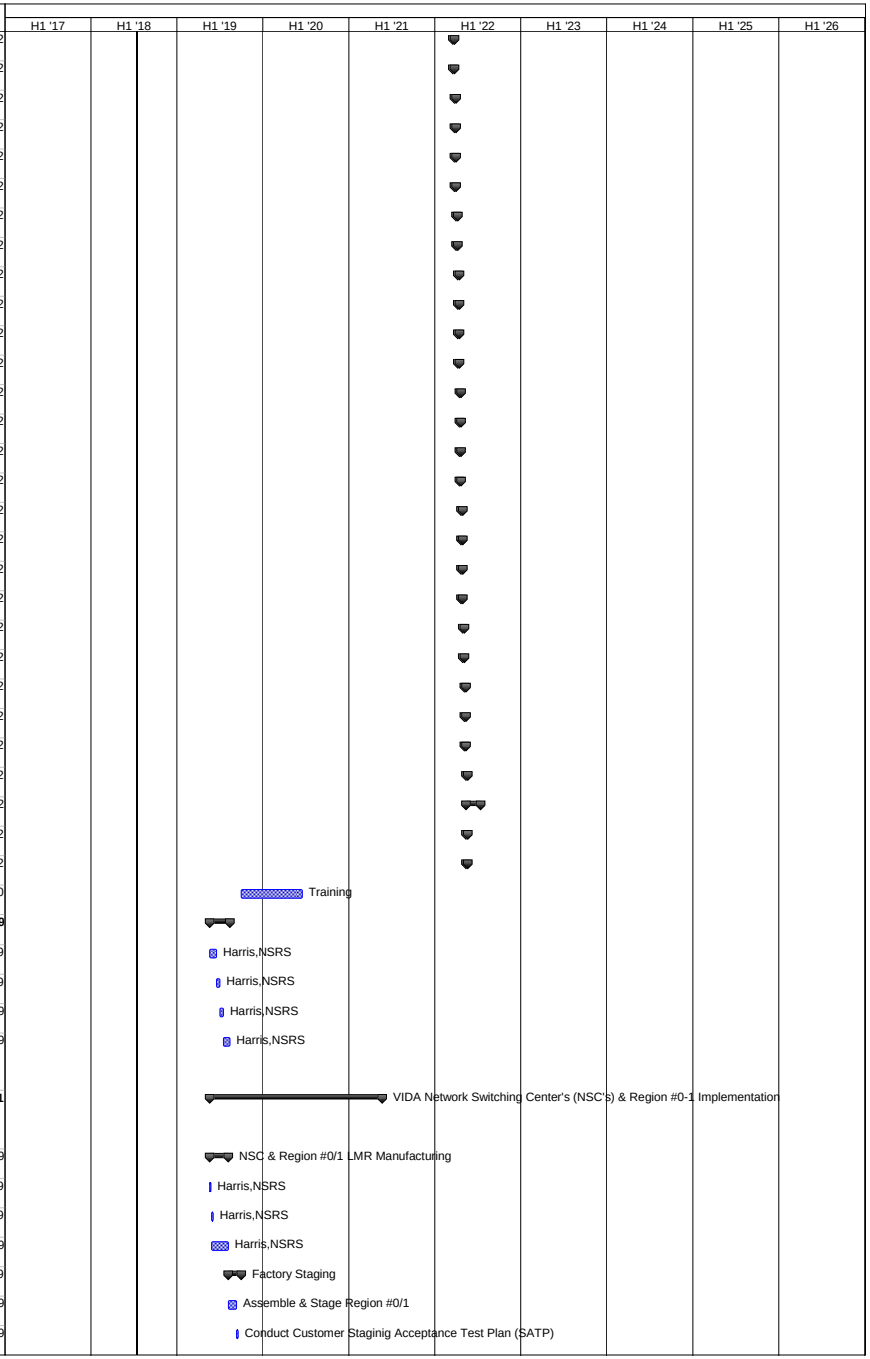
ID	Resource Names	Region	Name	Duration	Start	Finish
0			**Nevada Shared Radio System**	1337 days	Mon 10/1/18	Wed 12/27/23
1	NDOT,Harri		Contract Signed	2 days	Mon 10/1/18	Tue 10/2/18
2	Harris,NSR		**Contract Signed - Billing Milestone**	**0 days**	**Mon 10/1/18**	**Mon 10/1/18**
3	**Harris,NSR**		**Prepare for Detailed Design Review (DDR)**	**115 days**	**Wed 10/10/18**	**Mon 4/1/19**
4	Harris,NSRS	All	Internal Project Review Meetings	10 days	Wed 10/10/18	Tue 10/23/18
5	Harris,NSRS	All	Detailed Site Surveys/Tower Analysis	75 days	Wed 10/24/18	Mon 2/18/19
6	Harris,NSRS	All	Develop QA/QC plan	10 days	Wed 10/24/18	Tue 11/6/18
7	Harris,NSRS	All	Prepare for Customer Design Review	30 days	Wed 11/7/18	Thu 12/20/18
8	Harris,NSRS	All	LMR FCC-Frequency Coordination-License Preparation	15 days	Fri 12/21/18	Mon 1/21/19
9	NSRS,Harri	All	LMR FCC-Frequency Coordination-License Submission	1 day	Tue 1/22/19	Tue 1/22/19
10	Harris,NSRS	All	Run RF Interference Analysis	15 days	Wed 1/23/19	Tue 2/12/19
11	Harris,NSRS	All	Prepare propagation maps for DDR	5 days	Wed 2/13/19	Tue 2/19/19
14	Harris,NSRS	All	Prepare site drawings, floor plan & Rack drawings	30 days	Tue 2/19/19	Mon 4/1/19
15	**Harris,NSR**	**All**	**Detailed Design Review**	**34 days**	**Tue 4/2/19**	**Fri 5/17/19**
16	Harris,NSRS		Detailed Design Review Meeting	14 days	Tue 4/2/19	Fri 4/19/19
18	Harris,NSRS		Verify Customer Backhaul Design Documentation	3 days	Mon 4/22/19	Wed 4/24/19
19	NSRS		Detailed Design Review Approval	15 days	Mon 4/29/19	Fri 5/17/19
20	Harris,NSR		**CDR Approved by Customer - Billing Milestone**	**0 days**	**Fri 5/17/19**	**Fri 5/17/19**
21	NSRS,Harri	All	LMR FCC-Frequency Coordination-License Approval	90 edays	Tue 1/22/19	Mon 4/22/19
22			**Site Civil Construction**	801 days	Mon 5/20/19	Wed 7/13/22
23	Harris,NSRS		Develop site plots for all sites	4 wks	Mon 5/20/19	Mon 6/17/19
24	Harris,NSRS		Plans, Permits, and Approvals	212 days	Mon 5/20/19	Wed 3/25/20
174	Harris,NDO		**D/Hoover Dam P25 RF Site**	44 days	Thu 6/11/20	Wed 8/12/20
175	Harris,NDO		Mobilization / Layout	1 day	Thu 6/11/20	Thu 6/11/20
176	Harris,NDO		Clean Access / Compound Area	2 days	Fri 6/12/20	Mon 6/15/20
177	Harris,NDO		Grade Access / Compound	2 days	Tue 6/16/20	Wed 6/17/20
178	Harris,NDO		Install Tower Foundation	5 days	Thu 6/18/20	Wed 6/24/20
179	Harris,NDO		Install Shelter Foundations	3 days	Thu 6/25/20	Mon 6/29/20
180	Harris,NDO		Install Underground Grounding	3 days	Tue 6/30/20	Thu 7/2/20
181	Harris,NDO		Install Underground Utility Conduits	2 days	Mon 7/6/20	Tue 7/7/20
182	Harris,NDO		Stack Tower	15 days	Wed 7/8/20	Tue 7/28/20
183	Harris,NDO		Set Shelter	1 day	Wed 7/29/20	Wed 7/29/20
184	Harris,NDO		Install Ice Bridge	1 day	Thu 7/30/20	Thu 7/30/20
185	Harris,NDO		Complete Above Grade Utility Connections	1 day	Fri 7/31/20	Fri 7/31/20
186	Harris,NDO		Install Weed Barrier and Stone Compound	1 day	Mon 8/3/20	Mon 8/3/20
187	Harris,NDO		Install Fence	1 day	Tue 8/4/20	Tue 8/4/20
188	Harris,NDO		Complete Above Grade Grounding	1 day	Wed 8/5/20	Wed 8/5/20
189	Harris,NDO		Install Lines and Antennas	1 day	Thu 8/6/20	Thu 8/6/20
190	Harris,NDO		Perform ATP with Vendors	1 day	Fri 8/7/20	Fri 8/7/20
191	Harris,NDO		Provide re-line drawing to colocation owner	1 day	Mon 8/10/20	Mon 8/10/20
192	Harris,NDO		Punchlist items identified and resolved	1 day	Tue 8/11/20	Tue 8/11/20
193	Harris,NDO		Site Accepted by Harris and Customer	1 day	Wed 8/12/20	Wed 8/12/20
240	Harris,NDO		**D/Ragged Ridge P25 RF Site**	44 days	Thu 8/20/20	Tue 10/20/20
260	Harris,NDO		**D/Mesquite P25 RF Site**	44 days	Wed 10/21/20	Wed 12/23/20
304	Harris,NDO		**D/Coyote Springs P25 RF Site**	44 days	Wed 10/28/20	Fri 1/8/21



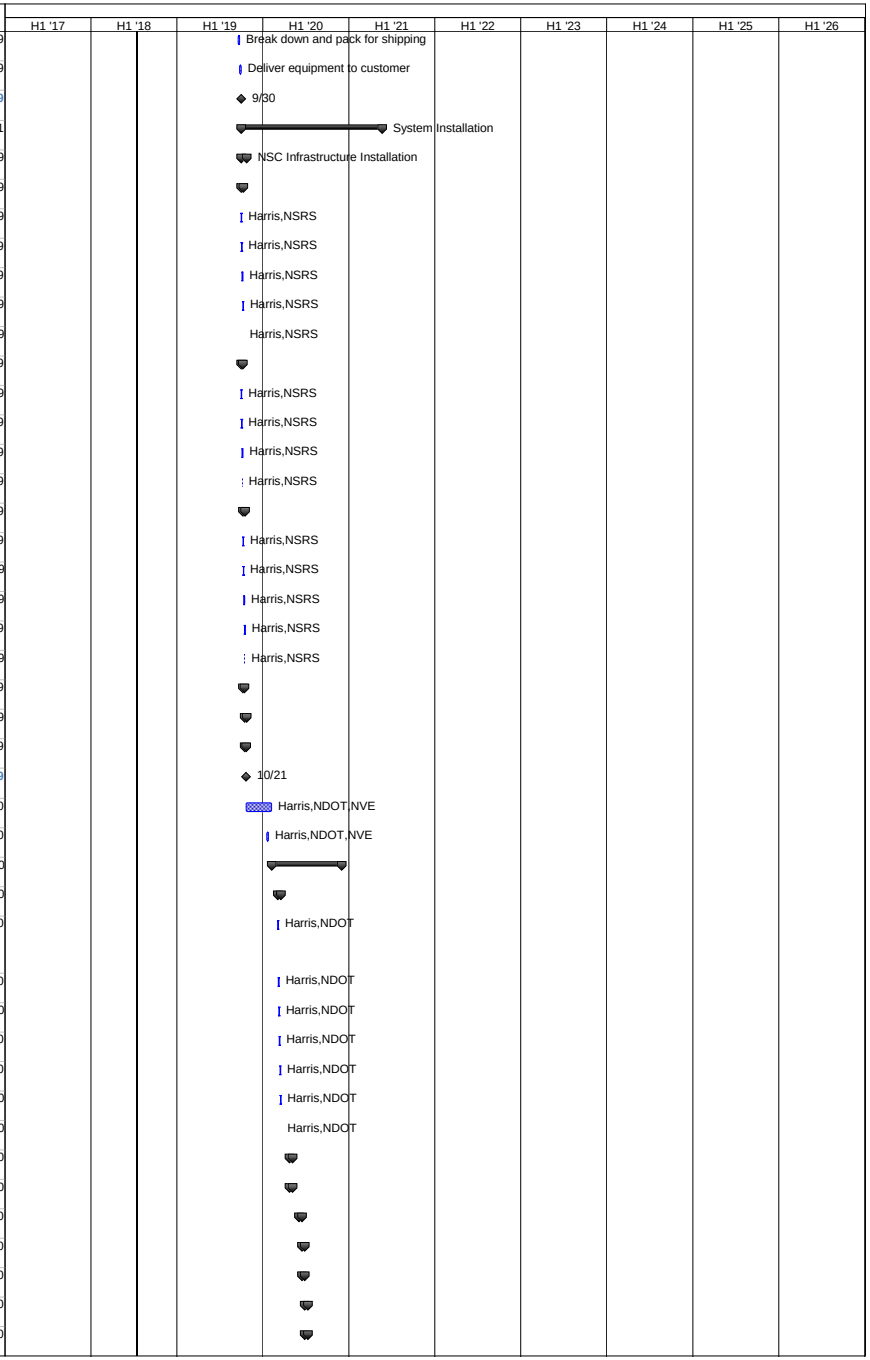
ID	Resource Names	Region	Name	Duration	Start	Finish
330	Harris,NDOT		**D/Alamo P25 RF Site**	44 days	Wed 10/28/20	Fri 1/8/21
350	Harris,NDOT		**D/Irish P25 RF Site**	44 days	Mon 1/11/21	Thu 3/11/21
370	Harris,NDOT		**D/Caliente P25 RF Site**	44 days	Mon 1/11/21	Thu 3/11/21
390	Harris,NDOT		**D/White River P25 RF Site**	44 days	Mon 1/11/21	Thu 3/11/21
410	Harris,NDOT		**D/Highland Peak P25 RF Site**	44 days	Mon 1/11/21	Thu 3/11/21
430	Harris,NDOT		**D/Wilson P25 RF Site**	44 days	Fri 3/12/21	Wed 5/12/21
450	Harris,NDOT		**D/Sunnyside P25 RF Site**	44 days	Fri 3/12/21	Wed 5/12/21
470	Harris,NDOT		**D/Timber P25 RF Site**	44 days	Fri 3/12/21	Wed 5/12/21
490	Harris,NDOT		**D/Warm Springs P25 RF Site**	44 days	Fri 3/12/21	Wed 5/12/21
510	Harris,NDOT		**D/Fitzpatrick P25 RF Site**	44 days	Thu 5/13/21	Tue 7/13/21
530	Harris,NDOT		**D/Pilot Peak P25 RF Site**	44 days	Thu 5/13/21	Tue 7/13/21
550	Harris,NDOT		**D/Millers P25 RF Site**	44 days	Thu 5/13/21	Tue 7/13/21
570	Harris,NDOT		**D/Tempiute P25 RF Site**	44 days	Thu 5/13/21	Tue 7/13/21
590	Harris,NDOT		**D/Brock P25 RF Site**	44 days	Wed 7/14/21	Mon 9/13/21
610	Harris,NDOT		**D/Montezuma P25 RF Site**	44 days	Wed 7/14/21	Mon 9/13/21
630	Harris,NDOT		**D/Palmetto P25 RF Site**	44 days	Wed 7/14/21	Mon 9/13/21
650	Harris,NDOT		**D/Sober P25 RF Site**	44 days	Wed 7/14/21	Mon 9/13/21
670	Harris,NDOT		**D/Sawtooth P25 RF Site**	44 days	Tue 9/14/21	Fri 11/12/21
690	Harris,NDOT		**D/Amargosa RF P25 RF Site**	44 days	Tue 9/14/21	Fri 11/12/21
710	Harris,NDOT		**D/Mercury P25 RF Site**	44 days	Tue 9/14/21	Fri 11/12/21
730	Harris,NDOT		**D/Schader P25 RF Site**	5 days	Tue 9/14/21	Mon 9/20/21
731	Harris,NDOT		Mobilization / Layout	1 day	Tue 9/14/21	Tue 9/14/21
732	Harris,NDOT		Install Lines and Antennas	1 day	Wed 9/15/21	Wed 9/15/21
733	Harris,NDOT		Perform ATP with Vendors	1 day	Thu 9/16/21	Thu 9/16/21
734	Harris,NDOT		Punchlist items identified and resolved	1 day	Fri 9/17/21	Fri 9/17/21
735	Harris,NDOT		Site Accepted by Harris and Customer	1 day	Mon 9/20/21	Mon 9/20/21
736	Harris,NDOT		**D/Indian Springs P25 RF Site**	44 days	Tue 9/21/21	Fri 11/19/21
756	Harris,NDOT		D/Deer Creek P25 RF Site	44 days	Tue 9/21/21	Fri 11/19/21
776	Harris,NDOT		D/Mt Charleston P25 RF Site	5 days	Tue 9/21/21	Mon 9/27/21
782	Harris,NDOT		D/Red Rock P25 RF Site	5 days	Tue 9/21/21	Mon 9/27/21
788	Harris,NDOT		D/Kinkaid P25 RF Site	5 days	Tue 9/28/21	Mon 10/4/21
800	Harris,NDOT		D/Pinegrove P25 RF Site	5 days	Tue 9/28/21	Mon 10/4/21
826	Harris,NDOT		D/Bald West P25 RF Site	5 days	Mon 11/29/21	Fri 12/3/21
852	Harris,NDOT		D/Fairview Peak P25 RF Site	5 days	Mon 11/29/21	Fri 12/3/21
858	Harris,NDOT		D/Hot Springs P25 RF Site	44 days	Mon 11/29/21	Thu 1/27/22
878	Harris,NDOT		D/Wildoat Mt P25 RF Site	5 days	Fri 1/28/22	Thu 2/3/22
884	Harris,NDOT		D/Muller P25 RF Site	5 days	Fri 1/28/22	Thu 2/3/22
890	Harris,NDOT		D/Spooner Summit P25 RF Site	5 days	Fri 1/28/22	Thu 2/3/22
902	Harris,NDOT		D/Eagle Ridge P25 RF Site	5 days	Fri 2/4/22	Thu 2/10/22
908	Harris,NDOT		D/Painted Rock P25 RF Site	5 days	Fri 2/4/22	Thu 2/10/22
914	Harris,NDOT		D/USA Highway P25 RF Site	5 days	Fri 2/4/22	Thu 2/10/22
1082	Harris,NDOT		D/Toulon P25 RF Site	5 days	Fri 3/4/22	Thu 3/10/22
1158	Harris,NDOT		D/Imlay P25 RF Site	5 days	Fri 3/18/22	Thu 3/24/22
1164	Harris,NDOT		D/New Pass P25 RF Site	5 days	Fri 3/18/22	Thu 3/24/22



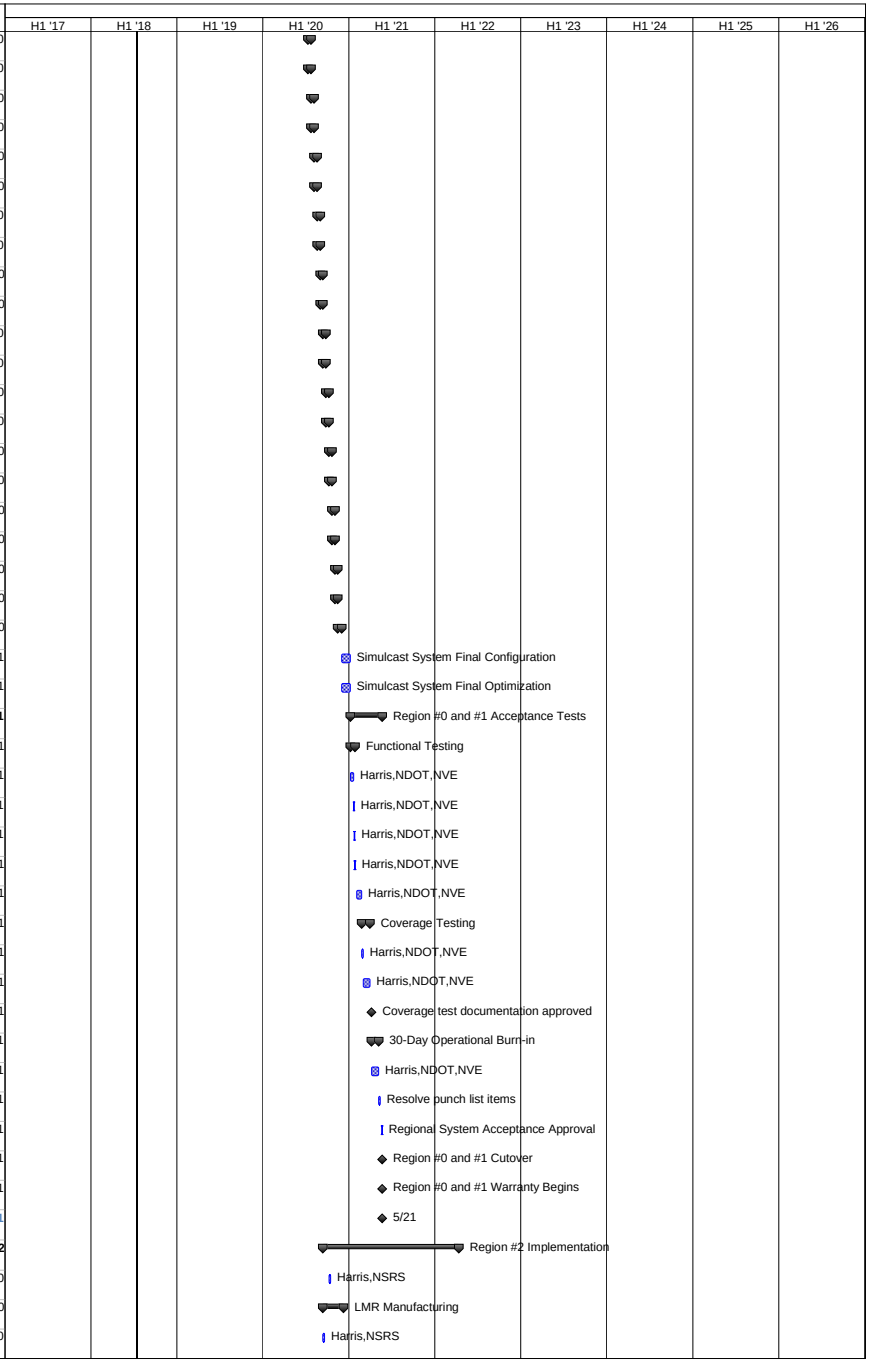
ID	Resource Names	Region	Name	Duration	Start	Finish
1170	Harris,NDO		D/Mt Moses P25 RF Site	5 days	Fri 3/18/22	Thu 3/24/22
1176	Harris,NDO		D/Mt Austin P25 RF Site	5 days	Fri 3/18/22	Thu 3/24/22
1182	Harris,NDO		D/Prospect Peak P25 RF Site	5 days	Fri 3/25/22	Thu 3/31/22
1188	Harris,NDO		D/Buster Mountain P25 RF Site	5 days	Fri 3/25/22	Thu 3/31/22
1194	Harris,NDO		D/Currant Summit P25 RF Site	5 days	Fri 3/25/22	Thu 3/31/22
1200	Harris,NDO		D/Kimberly P25 RF Site	5 days	Fri 3/25/22	Thu 3/31/22
1206	Harris,NDO		D/Squaw Peak P25 RF Site	5 days	Fri 4/1/22	Thu 4/7/22
1212	Harris,NDO		D/Cave Mountain P25 RF Site	5 days	Fri 4/1/22	Thu 4/7/22
1224	Harris,NDO		D/Border Inn P25 RF Site	5 days	Fri 4/8/22	Thu 4/14/22
1230	Harris,NDO		D/Victoria P25 RF Site	5 days	Fri 4/8/22	Thu 4/14/22
1236	Harris,NDO		D/Spruce P25 RF Site	5 days	Fri 4/8/22	Thu 4/14/22
1242	Harris,NDO		D/Secret Pass P25 RF Site	5 days	Fri 4/8/22	Thu 4/14/22
1248	Harris,NDO		D/3 Mile P25 RF Site	5 days	Fri 4/15/22	Thu 4/21/22
1254	Harris,NDO		D/Loray P25 RF Site	5 days	Fri 4/15/22	Thu 4/21/22
1260	Harris,NDO		D/Rocky Point P25 RF Site	5 days	Fri 4/15/22	Thu 4/21/22
1266	Harris,NDO		D/Peavy Hill P25 RF Site	5 days	Fri 4/15/22	Thu 4/21/22
1272	Harris,NDO		D/HD Summit P25 RF Site	5 days	Fri 4/22/22	Thu 4/28/22
1278	Harris,NDO		D/Jackpot P25 RF Site	5 days	Fri 4/22/22	Thu 4/28/22
1284	Harris,NDO		D/Ellen Dee P25 RF Site	5 days	Fri 4/22/22	Thu 4/28/22
1290	Harris,NDO		D/Elko Mountain P25 RF Site	5 days	Fri 4/22/22	Thu 4/28/22
1302	Harris,NDO		D/Emigrant P25 RF Site	5 days	Fri 4/29/22	Thu 5/5/22
1308	Harris,NDO		D/Mary's P25 RF Site	5 days	Fri 4/29/22	Thu 5/5/22
1320	Harris,NDO		D/Penn Hill P25 RF Site	5 days	Fri 5/6/22	Thu 5/12/22
1332	Harris,NDO		D/Golconda P25 RF Site	5 days	Fri 5/6/22	Thu 5/12/22
1338	Harris,NDO		D/Winnemucca Mountain P25 RF Site	5 days	Fri 5/6/22	Thu 5/12/22
1344	Harris,NDO		D/Trident Peak P25 RF Site	5 days	Fri 5/13/22	Thu 5/19/22
1350	Harris,NDO		D/Double H P25 RF Site	44 days	Fri 5/13/22	Wed 7/13/22
1370	Harris,NDO		D/Hickison P25 RF Site	5 days	Fri 5/13/22	Thu 5/19/22
1376	Harris,NDO		D/Flat Creek P25 RF Site	5 days	Fri 5/13/22	Thu 5/19/22
1383	Harris,NSRS	All	Training	175 days	Tue 10/1/19	Mon 6/15/20
1384	**Harris,NSR**		**Cutover planning**	**60 days**	**Mon 5/20/19**	**Tue 8/13/19**
1385	Harris,NSRS		Create Group Structure / Fleet Maps	20 days	Mon 5/20/19	Mon 6/17/19
1386	Harris,NSRS		Fleet Maps approved	10 days	Tue 6/18/19	Mon 7/1/19
1387	Harris,NSRS		Develop Radio Personalities	10 days	Tue 7/2/19	Tue 7/16/19
1388	Harris,NSRS		Develop a formal user cutover plan in conjunction with customer	20 days	Wed 7/17/19	Tue 8/13/19
1391	**Harris,NSR**	**Region #0/1**	**VIDA Network Switching Center's (NSC's) & Region #0-1 Implementation**	**502.5 days**	**Mon 5/20/19**	**Fri 5/21/21**
1392	Harris,NSRS		NSC & Region #0/1 LMR Manufacturing	55 days	Mon 5/20/19	Tue 8/6/19
1393	Harris,NSRS		Place orders on factory	5 days	Mon 5/20/19	Fri 5/24/19
1394	Harris,NSRS		Place orders on vendors	5 days	Tue 5/28/19	Mon 6/3/19
1395	Harris,NSRS		Manufacture P25 Radio System	10 wks	Tue 5/28/19	Tue 8/6/19
1396	Harris,NSRS		Factory Staging	39 days	Wed 8/7/19	Mon 9/30/19
1397	Harris,NSRS		Assemble & Stage Region #0/1	25 days	Wed 8/7/19	Tue 9/10/19
1398	Harris,NSRS		Conduct Customer Staginig Acceptance Test Plan (SATP)	5 days	Wed 9/11/19	Tue 9/17/19



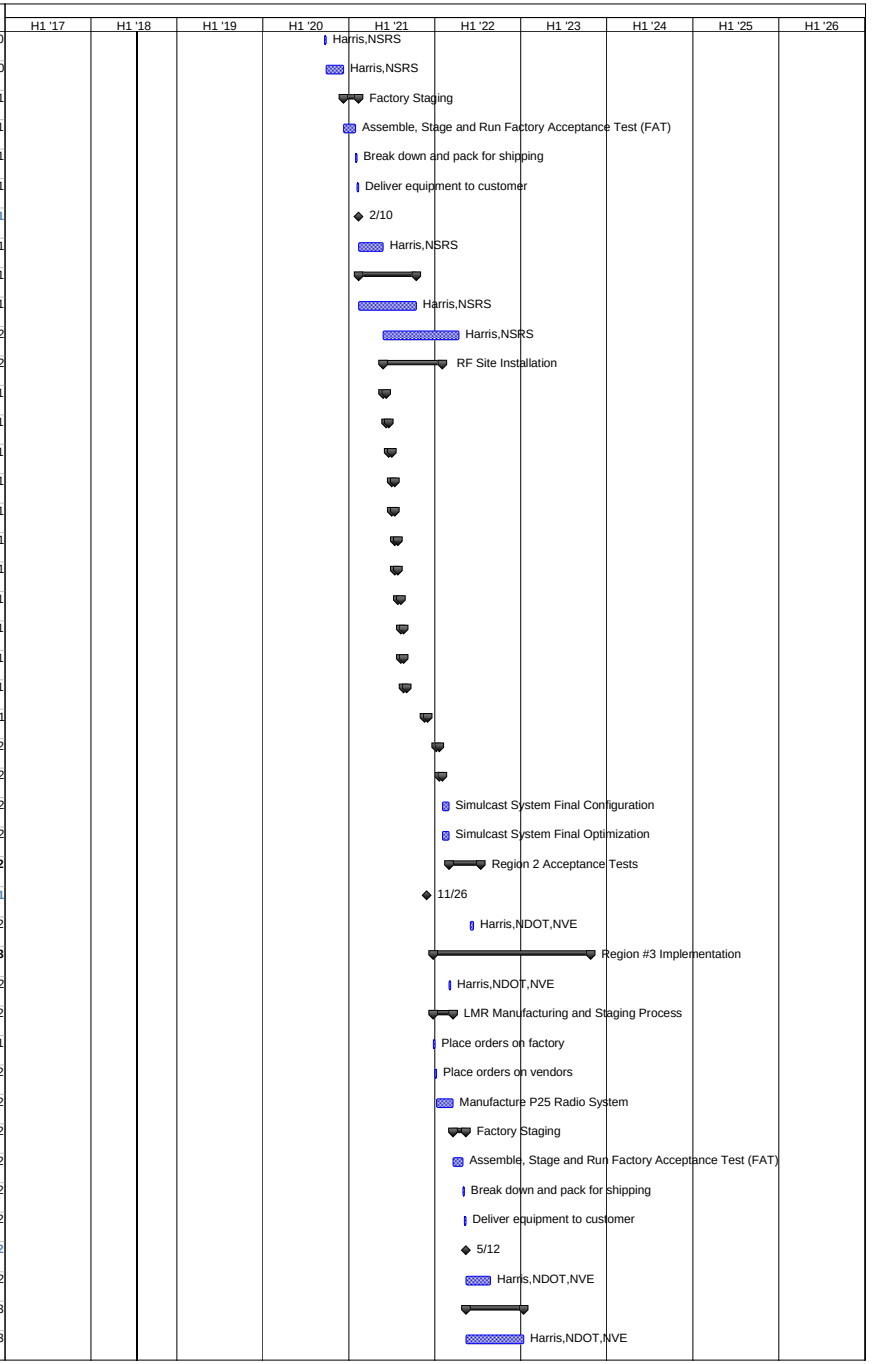
ID	Resource Names	Region	Name	Duration	Start	Finish
1399	Harris,NSRS		Break down and pack for shipping	4 days	Wed 9/18/19	Mon 9/23/19
1400	Harris,NSRS		Deliver equipment to customer	5 days	Tue 9/24/19	Mon 9/30/19
1401	Harris,NSR		**System Infrastructure Shipment and Delivery Acceptance - Billi**	**0 days**	**Mon 9/30/19**	**Mon 9/30/19**
1402			System Installation	408.5 days	Tue 10/1/19	Fri 5/21/21
1403	Harris,NSRS		NSC Infrastructure Installation	17 days	Tue 10/1/19	Wed 10/23/19
1404	Harris,NSRS		P25 Primary Network Switching Center	7 days	Tue 10/1/19	Wed 10/9/19
1405	Harris,NSRS		Install Primary Network Switching Center	2 days	Tue 10/1/19	Wed 10/2/19
1406	Harris,NSRS		Ground all equipment and connect to backhaul	1 day	Thu 10/3/19	Thu 10/3/19
1407	Harris,NSRS		Apply power and test NSC network	2 days	Fri 10/4/19	Mon 10/7/19
1408	Harris,NSRS		Install Trunked Logging Recorder	2 days	Tue 10/8/19	Wed 10/9/19
1409	Harris,NSRS		Final site clean up.	0.5 days	Tue 10/8/19	Tue 10/8/19
1410	Harris,NSRS		P25 Secondary Network Switching Center	5 days	Tue 10/1/19	Mon 10/7/19
1411	Harris,NSRS		Install Primary Network Switching Center	2 days	Tue 10/1/19	Wed 10/2/19
1412	Harris,NSRS		Ground all equipment and connect to backhaul	1 day	Thu 10/3/19	Thu 10/3/19
1413	Harris,NSRS		Apply power and test NSC network	2 days	Fri 10/4/19	Mon 10/7/19
1414	Harris,NSRS		Final site clean up.	0.5 days	Fri 10/4/19	Fri 10/4/19
1415	Harris,NSRS		Primary P25 VIDA Connect Switching Centers	7 days	Tue 10/8/19	Thu 10/17/19
1416	Harris,NSRS		Install Primary Network Switching Center	2 days	Tue 10/8/19	Thu 10/10/19
1417	Harris,NSRS		Ground all equipment and connect to backhaul	1 day	Thu 10/10/19	Fri 10/11/19
1418	Harris,NSRS		Apply power and test NSC network	2 days	Fri 10/11/19	Tue 10/15/19
1419	Harris,NSRS		Install Trunked Logging Recorder	2 days	Tue 10/15/19	Thu 10/17/19
1420	Harris,NSRS		Final site clean up.	0.5 days	Tue 10/15/19	Tue 10/15/19
1421	Harris,NSRS		Secondary P25 VIDA Connect Switching Centers	4 days	Tue 10/8/19	Mon 10/14/19
1426	Harris,NSRS		Primary P25 VIDA Connect Switching Centers	6 days	Wed 10/16/19	Wed 10/23/19
1432	Harris,NSRS		Secondary P25 VIDA Connect Switching Centers	4 days	Wed 10/16/19	Mon 10/21/19
1437	Harris,NSR		**NSC Installation Complete - Billing Milestone**	**0 days**	**Mon 10/21/19**	**Mon 10/21/19**
1438	Harris,NDO		Install Dispatch Console and Control Station	69 days	Mon 10/21/19	Thu 2/6/20
1521	Harris,NDO		Region 1 Cutover planning	5 days	Fri 1/17/20	Fri 1/24/20
1522		Region #1	RF Sites	207 days	Fri 2/7/20	Mon 11/30/20
1563	Harris,NDO		D/Hoover Dam P25 RF Site	9 days	Wed 3/4/20	Tue 3/17/20
1564	Harris,NDO		Install P25 RF Site equipment, ground all equipment and connect to backhaul	2 days	Wed 3/4/20	Fri 3/6/20
1565	Harris,NDO		Install GPS Antenna Systems.	1 day	Fri 3/6/20	Mon 3/9/20
1566	Harris,NDO		Make all RF cables & connections	1 day	Mon 3/9/20	Tue 3/10/20
1567	Harris,NDO		Connect all alarms points to alarm system	3 days	Tue 3/10/20	Fri 3/13/20
1568	Harris,NDO		Apply power, set levels and parameters	1 day	Fri 3/13/20	Mon 3/16/20
1569	Harris,NDO		Preliminary Functional Testing	1 day	Mon 3/16/20	Tue 3/17/20
1570	Harris,NDO		Final site clean up	0.5 days	Tue 3/17/20	Tue 3/17/20
1627	Harris,NDO		D/Ragged Ridge P25 RF Site	9 days	Thu 4/23/20	Wed 5/6/20
1635	Harris,NDO		D/Mesquite P25 RF Site	9 days	Thu 4/23/20	Wed 5/6/20
1675	Harris,NDO		D/Coyote Springs P25 RF Site	9 days	Tue 6/2/20	Mon 6/15/20
1691	Harris,NDO		D/Alamo P25 RF Site	9 days	Mon 6/15/20	Fri 6/26/20
1699	Harris,NDO		D/Irish P25 RF Site	9 days	Mon 6/15/20	Fri 6/26/20
1707	Harris,NDO		D/Caliente P25 RF Site	9 days	Fri 6/26/20	Fri 7/10/20
1715	Harris,NDO		D/White River P25 RF Site	9 days	Fri 6/26/20	Fri 7/10/20



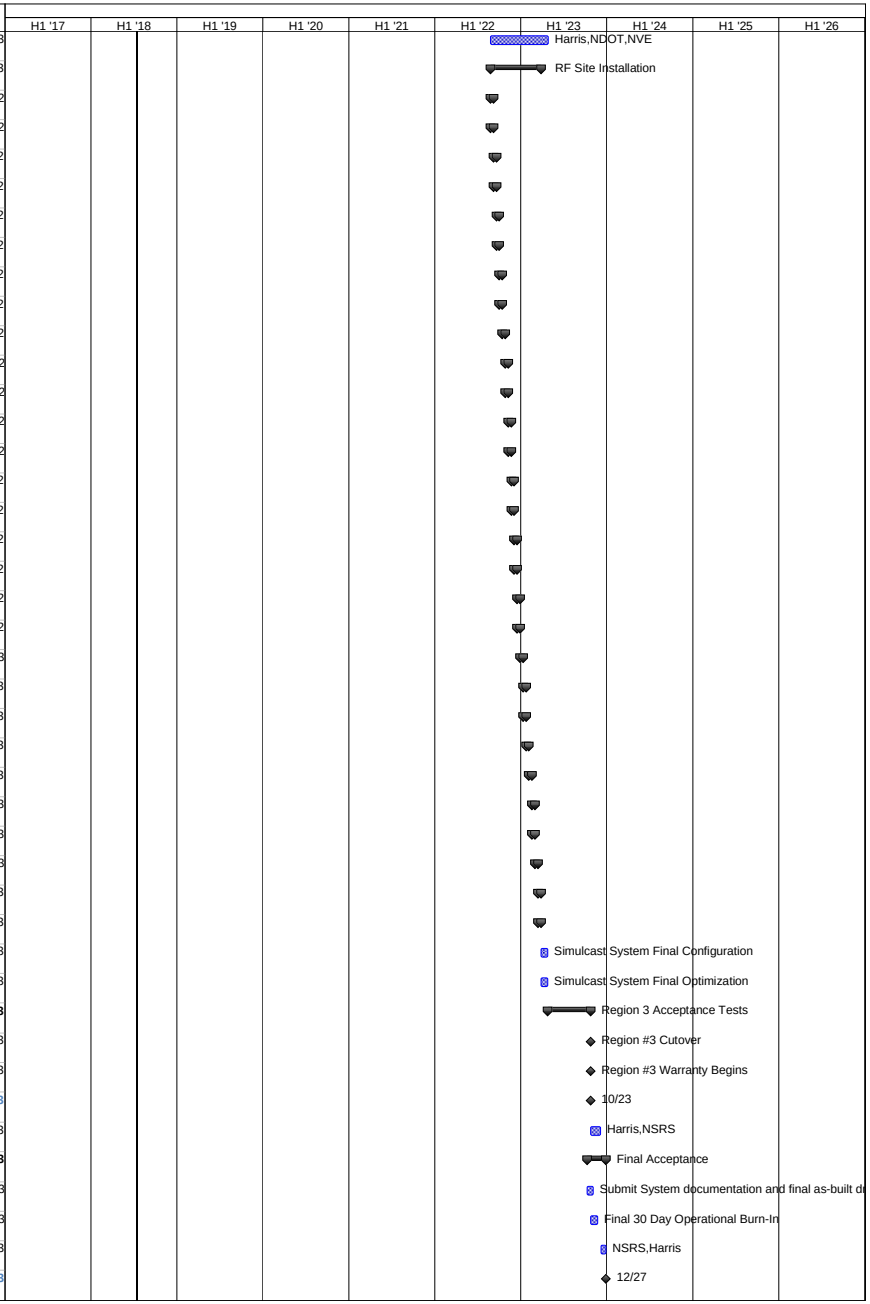
ID	Resource Names	Region	Name	Duration	Start	Finish
1723	Harris,NDO		D/Highland Peak P25 RF Site	9 days	Fri 7/10/20	Thu 7/23/20
1731	Harris,NDO		D/Wilson P25 RF Site	9 days	Fri 7/10/20	Thu 7/23/20
1739	Harris,NDO		D/Sunnyside P25 RF Site	9 days	Thu 7/23/20	Wed 8/5/20
1747	Harris,NDO		D/Timber P25 RF Site	9 days	Thu 7/23/20	Wed 8/5/20
1755	Harris,NDO		D/Warm Springs P25 RF Site	9 days	Wed 8/5/20	Tue 8/18/20
1763	Harris,NDO		D/Fitzpatrick P25 RF Site	9 days	Wed 8/5/20	Tue 8/18/20
1771	Harris,NDO		D/Pilot Peak P25 RF Site	9 days	Tue 8/18/20	Mon 8/31/20
1779	Harris,NDO		D/Millers P25 RF Site	9 days	Tue 8/18/20	Mon 8/31/20
1787	Harris,NDO		D/Tempiute P25 RF Site	9 days	Mon 8/31/20	Fri 9/11/20
1795	Harris,NDO		D/Brock P25 RF Site	9 days	Mon 8/31/20	Fri 9/11/20
1803	Harris,NDO		D/Montezuma P25 RF Site	9 days	Fri 9/11/20	Thu 9/24/20
1811	Harris,NDO		D/Palmetto P25 RF Site	9 days	Fri 9/11/20	Thu 9/24/20
1819	Harris,NDO		D/Sober P25 RF Site	9 days	Thu 9/24/20	Wed 10/7/20
1827	Harris,NDO		D/Sawtooth P25 RF Site	9 days	Thu 9/24/20	Wed 10/7/20
1835	Harris,NDO		D/Amargosa RF P25 RF Site	9 days	Wed 10/7/20	Tue 10/20/20
1843	Harris,NDO		D/Mercury P25 RF Site	9 days	Wed 10/7/20	Tue 10/20/20
1851	Harris,NDO		D/Schader P25 RF Site	9 days	Tue 10/20/20	Mon 11/2/20
1859	Harris,NDO		E/Indian Springs P25 RF Site	9 days	Tue 10/20/20	Mon 11/2/20
1867	Harris,NDO		D/Deer Creek P25 RF Site	9 days	Mon 11/2/20	Fri 11/13/20
1875	Harris,NDO		D/Mt Charleston P25 RF Site	9 days	Mon 11/2/20	Fri 11/13/20
1883	Harris,NDO		D/Red Rock P25 RF Site	9 days	Fri 11/13/20	Mon 11/30/20
1891	Harris,NDO		Simulcast System Final Configuration	20 days	Mon 11/30/20	Wed 1/6/21
1892	Harris,NDO		Simulcast System Final Optimization	20 days	Mon 11/30/20	Wed 1/6/21
1893	**Harris,NDO**		**Region #0 and #1 Acceptance Tests**	**97 days**	**Wed 1/6/21**	**Fri 5/21/21**
1894	Harris,NDO		Functional Testing	14 days	Wed 1/6/21	Tue 1/26/21
1895	Harris,NDO		Run Functional Test at each RF site	10 days	Wed 1/6/21	Wed 1/20/21
1896	Harris,NDO		Final Site inspections @ new sites	2 days	Wed 1/20/21	Fri 1/22/21
1897	Harris,NDO		Run Functional Test at Dispatch Center	1 day	Fri 1/22/21	Mon 1/25/21
1898	Harris,NDO		Submit Functional test documentation	1 day	Mon 1/25/21	Tue 1/26/21
1899	Harris,NDO		Functional test documentation approved	15 days	Tue 2/2/21	Tue 2/23/21
1900	Harris,NDO		Coverage Testing	25 days	Tue 2/23/21	Tue 3/30/21
1901	Harris,NDO		Run coverage test (automated signal strength) (CATP)	1 wk	Tue 2/23/21	Tue 3/2/21
1902	Harris,NDO		Voice Quality Coverage Test (CATP)	4 wks	Tue 3/2/21	Tue 3/30/21
1903	Harris,NDO		Coverage test documentation approved	0 days	Tue 4/6/21	Tue 4/6/21
1904	Harris,NDO		30-Day Operational Burn-in	22 days	Tue 4/6/21	Thu 5/6/21
1905	Harris,NDO		Conduct 30-Day Operational Burn-in	30 edays	Tue 4/6/21	Thu 5/6/21
1906	Harris,NDO		Resolve punch list items	1 wk	Thu 5/6/21	Thu 5/13/21
1907	Harris,NDO		Regional System Acceptance Approval	1 day	Thu 5/20/21	Fri 5/21/21
1908	Harris,NDO		Region #0 and #1 Cutover	0 days	Fri 5/21/21	Fri 5/21/21
1909	Harris,NDO		Region #0 and #1 Warranty Begins	0 days	Fri 5/21/21	Fri 5/21/21
1910	Harris,NDO		Region 1 Installation Complete - Billing Milestone	0 days	Fri 5/21/21	Fri 5/21/21
1911		**Region #2**	**Region #2 Implementation**	**403 days**	**Fri 9/11/20**	**Tue 4/12/22**
1912	Harris,NSRS		Cutover planning	5 days	Wed 10/7/20	Wed 10/14/20
1913	Harris,NSRS		LMR Manufacturing	60 days	Fri 9/11/20	Tue 12/8/20
1914	Harris,NSRS		Place orders on factory	5 days	Fri 9/11/20	Fri 9/18/20



ID	Resource Names	Region	Name	Duration	Start	Finish
1915	Harris,NSRS		Place orders on vendors	5 days	Fri 9/18/20	Fri 9/25/20
1916	Harris,NSRS		Manufacture P25 Radio System	10 wks	Fri 9/25/20	Tue 12/8/20
1917	Harris,NSRS		Factory Staging	39 days	Tue 12/8/20	Wed 2/10/21
1918	Harris,NSRS		Assemble, Stage and Run Factory Acceptance Test (FAT)	30 days	Tue 12/8/20	Thu 1/28/21
1919	Harris,NSRS		Break down and pack for shipping	4 days	Thu 1/28/21	Wed 2/3/21
1920	Harris,NSRS		Deliver equipment to customer	5 days	Wed 2/3/21	Wed 2/10/21
1921	Harris,NSR		Region 2 System Infrastructure Shipment and Delivery Accepta	0 days	Wed 2/10/21	Wed 2/10/21
1922	Harris,NSRS		Install Dispatch Console and Control Station	74 days	Wed 2/10/21	Tue 5/25/21
1923	Harris,NSRS		Portable Radio and Mobile Cutover	175 days	Wed 2/10/21	Wed 10/13/21
1924	Harris,NSRS		Program and install mobile radios/Distribute Portable	35 wks	Wed 2/10/21	Wed 10/13/21
1925	Harris,NSRS		Training	230 days	Tue 5/25/21	Tue 4/12/22
1926	Harris,NSRS	Region #2	RF Site Installation	180 days	Tue 5/25/21	Tue 2/1/22
1927	Harris,NDOT		D/Kinkaid P25 RF Site	9 days	Tue 5/25/21	Mon 6/7/21
1943	Harris,NDOT		D/Pinegrove P25 RF Site	9 days	Mon 6/7/21	Fri 6/18/21
1959	Harris,NDOT		D/Bald West P25 RF Site	9 days	Fri 6/18/21	Thu 7/1/21
1975	Harris,NDOT		D/Fairview Peak P25 RF Site	9 days	Thu 7/1/21	Wed 7/14/21
1983	Harris,NDOT		D/Hot Springs P25 RF Site	9 days	Thu 7/1/21	Wed 7/14/21
1991	Harris,NDOT		D/Wildoat Mt P25 RF Site	9 days	Wed 7/14/21	Tue 7/27/21
1999	Harris,NDOT		E/Muller P25 RF Site	9 days	Wed 7/14/21	Tue 7/27/21
2007	Harris,NDOT		D/Spooner Summit P25 RF Site	9 days	Tue 7/27/21	Mon 8/9/21
2023	Harris,NDOT		D/Eagle Ridge P25 RF Site	9 days	Mon 8/9/21	Fri 8/20/21
2031	Harris,NDOT		D/Painted Rock P25 RF Site	9 days	Mon 8/9/21	Fri 8/20/21
2039	Harris,NDOT		D/USA Highway P25 RF Site	9 days	Fri 8/20/21	Thu 9/2/21
2151	Harris,NDOT		D/Toulon P25 RF Site	9 days	Wed 11/17/21	Tue 11/30/21
2215	Harris,NDOT		D/Imlay P25 RF Site	9 days	Thu 1/6/22	Wed 1/19/22
2223	Harris,NDOT		D/New Pass P25 RF Site	9 days	Wed 1/19/22	Tue 2/1/22
2231	Harris,NSRS		Simulcast System Final Configuration	20 days	Tue 2/1/22	Tue 3/1/22
2232	Harris,NSRS		Simulcast System Final Optimization	20 days	Tue 2/1/22	Tue 3/1/22
2233	**Harris,NSR**		**Region 2 Acceptance Tests**	**97 days**	**Tue 3/1/22**	**Thu 7/14/22**
2250	Harris,NSR		Region 2 Installation Complete - Billing Milestone	0 days	Fri 11/26/21	Fri 11/26/21
2251	Harris,NDOT		Perform Software Updates for Region 1	2 wks	Mon 5/30/22	Mon 6/13/22
2252	**Harris,NDOT**	**Region #3**	**Region #3 Implementation**	**476.5 days**	**Fri 12/24/21**	**Mon 10/23/23**
2253	Harris,NDOT		Cutover planning	5 days	Tue 3/1/22	Tue 3/8/22
2254	Harris,NDOT		LMR Manufacturing and Staging Process	60 days	Fri 12/24/21	Fri 3/18/22
2255	Harris,NDOT		Place orders on factory	5 days	Fri 12/24/21	Fri 12/31/21
2256	Harris,NDOT		Place orders on vendors	5 days	Fri 12/31/21	Fri 1/7/22
2257	Harris,NDOT		Manufacture P25 Radio System	10 wks	Fri 1/7/22	Fri 3/18/22
2258	Harris,NDOT		Factory Staging	39 days	Fri 3/18/22	Thu 5/12/22
2259	Harris,NDOT		Assemble, Stage and Run Factory Acceptance Test (FAT)	30 days	Fri 3/18/22	Fri 4/29/22
2260	Harris,NDOT		Break down and pack for shipping	4 days	Fri 4/29/22	Thu 5/5/22
2261	Harris,NDOT		Deliver equipment to customer	5 days	Thu 5/5/22	Thu 5/12/22
2262	Harris,NDOT		Region 3 System Infrastructure Shipment and Delivery Accepta	0 days	Thu 5/12/22	Thu 5/12/22
2263	Harris,NDOT		Install Dispatch Console and Control Station	74 days	Thu 5/12/22	Wed 8/24/22
2264	Harris,NDOT		Portable Radio and Mobile Cutover	175 days	Thu 5/12/22	Thu 1/12/23
2265	Harris,NDOT		Program and install mobile radios/Distribute Portable	35 wks	Thu 5/12/22	Thu 1/12/23



ID	Resource Names	Region	Name	Duration	Start	Finish
2266	Harris,NDO		Training	175 days	Wed 8/24/22	Wed 4/26/23
2267	Harris,NDO	Region #3	RF Site Installation	153 days	Wed 8/24/22	Mon 3/27/23
2268	Harris,NDO		D/Mt Moses P25 RF Site	9 days	Wed 8/24/22	Tue 9/6/22
2276	Harris,NDO		D/Mt Austin P25 RF Site	9 days	Wed 8/24/22	Tue 9/6/22
2284	Harris,NDO		D/Prospect Peak P25 RF Site	9 days	Tue 9/6/22	Mon 9/19/22
2292	Harris,NDO		D/Buster Mountain P25 RF Site	9 days	Tue 9/6/22	Mon 9/19/22
2300	Harris,NDO		D/Currant Summit P25 RF Site	9 days	Mon 9/19/22	Fri 9/30/22
2308	Harris,NDO		D/Kimberly P25 RF Site	9 days	Mon 9/19/22	Fri 9/30/22
2316	Harris,NDO		D/Squaw Peak P25 RF Site	9 days	Fri 9/30/22	Thu 10/13/22
2324	Harris,NDO		D/Cave Mountain P25 RF Site	9 days	Fri 9/30/22	Thu 10/13/22
2340	Harris,NDO		D/Border Inn P25 RF Site	9 days	Thu 10/13/22	Wed 10/26/22
2348	Harris,NDO		D/Victoria P25 RF Site	9 days	Wed 10/26/22	Tue 11/8/22
2356	Harris,NDO		D/Spruce P25 RF Site	9 days	Wed 10/26/22	Tue 11/8/22
2364	Harris,NDO		D/Secret Pass P25 RF Site	9 days	Tue 11/8/22	Mon 11/21/22
2372	Harris,NDO		D/3 Mile P25 RF Site	9 days	Tue 11/8/22	Mon 11/21/22
2380	Harris,NDO		D/Loray P25 RF Site	9 days	Mon 11/21/22	Fri 12/2/22
2388	Harris,NDO		D/Rocky Point P25 RF Site	9 days	Mon 11/21/22	Fri 12/2/22
2396	Harris,NDO		D/Peavy Hill P25 RF Site	9 days	Fri 12/2/22	Thu 12/15/22
2404	Harris,NDO		D/HD Summit P25 RF Site	9 days	Fri 12/2/22	Thu 12/15/22
2412	Harris,NDO		D/Jackpot P25 RF Site	9 days	Thu 12/15/22	Wed 12/28/22
2420	Harris,NDO		D/Ellen Dee P25 RF Site	9 days	Thu 12/15/22	Wed 12/28/22
2428	Harris,NDO		D/Elko Mountain P25 RF Site	9 days	Wed 12/28/22	Tue 1/10/23
2444	Harris,NDO		D/Emigrant P25 RF Site	9 days	Tue 1/10/23	Mon 1/23/23
2452	Harris,NDO		D/Mary's P25 RF Site	9 days	Tue 1/10/23	Mon 1/23/23
2468	Harris,NDO		D/Penn Hill P25 RF Site	9 days	Mon 1/23/23	Fri 2/3/23
2484	Harris,NDO		D/Golconda P25 RF Site	9 days	Fri 2/3/23	Thu 2/16/23
2492	Harris,NDO		D/Winnemucca Mountain P25 RF Site	9 days	Thu 2/16/23	Wed 3/1/23
2500	Harris,NDO		D/Trident Peak P25 RF Site	9 days	Thu 2/16/23	Wed 3/1/23
2508	Harris,NDO		D/Double H P25 RF Site	9 days	Wed 3/1/23	Tue 3/14/23
2516	Harris,NDO		D/Hickison P25 RF Site	9 days	Tue 3/14/23	Mon 3/27/23
2524	Harris,NDO		D/Flat Creek P25 RF Site	9 days	Tue 3/14/23	Mon 3/27/23
2532	Harris,NDO		Simulcast System Final Configuration	20 days	Mon 3/27/23	Mon 4/24/23
2533	Harris,NDO		Simulcast System Final Optimization	20 days	Mon 3/27/23	Mon 4/24/23
2534	**Harris,NDO**		**Region 3 Acceptance Tests**	**130.5 days**	**Mon 4/24/23**	**Mon 10/23/23**
2549	Harris,NDO		Region #3 Cutover	0 days	Mon 10/23/23	Mon 10/23/23
2550	Harris,NDO		Region #3 Warranty Begins	0 days	Mon 10/23/23	Mon 10/23/23
2551	**Harris,NDO**		**Region 3 Installation Complete - Billing Milestone**	**0 days**	**Mon 10/23/23**	**Mon 10/23/23**
2552	Harris,NSR		Perform Software Updates for Region 1 & 2	30 days	Tue 10/24/23	Mon 12/4/23
2553	**Harris,NSR**	**All**	**Final Acceptance**	**58 days**	**Mon 10/9/23**	**Wed 12/27/23**
2554	Harris,NSR	All	Submit System documentation and final as-built drawings	20 days	Mon 10/9/23	Fri 11/3/23
2555	Harris,NSR	All	Final 30 Day Operational Burn-In	30 edays	Mon 10/23/23	Wed 11/22/23
2556	NSRS,Harri	All	Sign Letter of Final Acceptance	15 days	Thu 12/7/23	Wed 12/27/23
2557	**Harris,NSR**		**System Acceptance Testing Complete - Billing Milestone**	**0 days**	**Wed 12/27/23**	**Wed 12/27/23**



Part Number	Description	Quantity
	NORTH	
	ANTENNA SYSTEM EQUIPMENT - NORTH	
CA-015466-001	Cable,Coaxial,1/2in Superflex	7755
CA-015471-001	Cable,Coaxial,1 5/8in,Low Loss Foam	6835
CA-015474-001	Cable,Coaxial,7/8in,Low Loss Foam	6835
CN-009256	Connector,NF,7/8in Coax,O-Ring Sealing	84
CN-014877-001	Connector,N Female,For 1/2in Coax	84
E75-4000-007	SURGE SUPPRESSOR,800-2500MHZ BROADBAND	42
E75-4000-143	SURGE FILTER,DC BLOCK 698MHZ-2.7GHZ FEM	42
J90-0114-021	CONN 7/16 DIN FEMALE COAX CABLE 1-5/8"	84
KT-014844-001	Kit,Coax Hoisting Grip,1 5/8 in	42
KT-014859-001	Kit,Hoisting Grip,7/8 in Cable	42
KT-014860-001	Kit,Cable Boot,4 in,3 Holes,1/2 in Cable	42
KT-014861-001	Kit,Cable Boot,4 in,For One 7/8 in Cable	42
KT-014862-001	Kit,Cable Boot,4 in,For One 1 5/8 in Ca	42
KT-014874-001	Kit,Hoisting Grip,1/2 in Cable	42
LCF12-50J	Cable,Coaxial,1/2in Low Loss,LCf12-50J	6835
NM-SCF12-070	Connector,Rapid Fit,SCF12-50 NM	168
W90-0100-009	CABLE ASSY, SURE FLEX N MALE-N MALE 4FT	42
W90-0100-011	CABLE ASSY, SURE FLEX N MALE-N MALE 6FT	42
W90-0100-025	CABLE ASSY, SURE FLEX DIN(M)-DIN(M) 10FT	42
W90-0223-701	CABLE ASSY BNC(M) TO SMA(M) RG223 72 IN	209
	P25 AND CONVENTIONAL SITE EQUIPMENT	
MASA-NCL7D	Kit,Cable,Ethernet,5ft	42
MASA-SVP25	Site Interface Equipment,P25T MASTR V	42
SA-MD6H	OSCILLATOR, 10MHZ REF,-12VDC,6 PORT	42
SA-MD7E-DC	Controller,P25 MME Data,Addl Site,DC	42
SAMD7Y-DC	KIT, NET SENTRY, CNTL/DATA, DC PWR,WIN10	42
SA-MR1J	RACK,OPEN,84 IN,SEISMIC	42
SASG9N	Feature,P25 Multisite Support	42
	MASTR V STATIONS	
MASV-800M1-A	STATION,MASTR V,P25T,800 MHZ,799-817 RX	209
MASV-NCL8Z	Cable,DC Power 60in	11
MASV-NMA6Q	Grounding Shim,28RU	42
MASV-NSG9K	Feature,Software,P25 Phase 2	209
MASV-NZN8R	Panel,Blank Module,MASTR V	186
SV-AT1B	TERMINATION,50 OHM LOAD	183
SV-AW5R-A	POWER AMPLIFIER,LINEAR,800 MHZ	209
SV-CA5J	CABLE,DC POWER,48 IN	110
SV-CL2D	Cable,Xconnect-Baseband Shelf #1	84
SV-CL2D-DC	Cable,3560v2 Switch, DC Power	42
SV-CL2E	Cable,Xconnect-Baseband Shelf #2	27
SV-CL2N	Cable Assembly RF,RG223,BNC/SMA,5ft	111
SV-CL9V	Kit,Cable,Ch #1,2,9,10,17,18 MASTR V IP	84
SV-CL9W	Kit,Cable,Ch #3,4,11,12,19,20 MASTR V IP	84
SV-CL9X	Kit,Cable,Ch #5,6,13,14,21,22 MASTR V IP	37
SV-CL9Y	Kit,Cable,Ch #7,8,15,16,23,24 MASTR V IP	4
SV-CN1B	POWER STRIP,-48VDC LOW PWR DIST,SEISMIC	42
SV-CN7Z	POWER STRIP,-48VDC HIGH PWR DIST,RACK	66
SV-DW1B	Drawings,IP Simulcast/P25 Trunked	42
SV-MN2Z	PANEL,BLANK,PS CHASSIS	20
SV-MN9S	Panel,Blank,1 RU	42
SV-MR1J	RACK,OPEN,84 IN,SEISMIC	42
SV-NZN8S-DC	Fan Tray,MASTR V, DC	42
SV-PM1C	Processor,Baseband Module,MASTR V	111
SV-PS2P-DC	Power Supply,-48V,DC,MASTR V	229
SV-RB3A	Power Supply Shelf,2nd Position	42
SV-RB3B	Power Supply Shelf,1st Position	42

Part Number	Description	Quantity
SV-RB3C	Power Supply Shelf	145
SV-RB3G	Shelf,14-Slot,Open Rack	66
SV-RB3K	Busbar,HPA/PS,MASTR V	209
SV-SP2T	Programming,Multisite	209
SV-ZM1X	KIT,REDUNDANT POWER SUPPLY	66
SV-ZN9K	PANEL,XCONNECT,MASTR V	42
VIDA NETWORKING & SECURITY		
VS-CJ2W	POWER SUPPLY,DC,ISR4221	84
VS-CR1F	ROUTER,ISR4221/K9	84
VS-CU5C	SWITCH,CISCO ME 3400E,DC,24-PORT	45
VS-CU7Z	MODULE,NIM 4PORT LAYER2 GE	84
VSMA7B	KIT,MOUNTING HARDWARE, CISCO ME3400	45
VS-MN3T	KIT, CISCO 4221 ROUTER, SITE MTG	84
VSVS01	VS PROD GRP, CONFIGURED MODEL NUMBER	42
VS-CU5C	SWITCH,CISCO ME 3400E,DC,24-PORT	42
VSMA7B	KIT,MOUNTING HARDWARE, CISCO ME3400	42
SOUTH		
ANTENNA SYSTEM EQUIPMENT		
CA-015466-001	Cable,Coaxial,1/2in Superflex	5325
CA-015471-001	Cable,Coaxial,1 5/8in,Low Loss Foam	5175
CA-015474-001	Cable,Coaxial,7/8in,Low Loss Foam	5175
CN-009256	Connector,NF,7/8in Coax,O-Ring Sealing	60
CN-014877-001	Connector,N Female,For 1/2in Coax	60
E75-4000-007	SURGE SUPPRESSOR,800-2500MHZ BROADBAND	30
E75-4000-143	SURGE FILTER,DC BLOCK 698MHZ-2.7GHZ FEM	30
J90-0114-021	CONN 7/16 DIN FEMALE COAX CABLE 1-5/8"	60
KT-014844-001	Kit,Coax Hoisting Grip,1 5/8 in	30
KT-014859-001	Kit,Hoisting Grip,7/8 in Cable	30
KT-014860-001	Kit,Cable Boot,4 in,3 Holes,1/2 in Cable	30
KT-014861-001	Kit,Cable Boot,4 in,For One 7/8 in Cable	30
KT-014862-001	Kit,Cable Boot,4 in,For One 1 5/8 in Ca	30
KT-014874-001	Kit,Hoisting Grip,1/2 in Cable	30
LCF12-50J	Cable,Coaxial,1/2in Low Loss,LCf12-50J	5175
NM-SCF12-070	Connector,Rapid Fit,SCF12-50 NM	120
W90-0100-009	CABLE ASSY, SURE FLEX N MALE-N MALE 4FT	30
W90-0100-011	CABLE ASSY, SURE FLEX N MALE-N MALE 6FT	30
W90-0100-025	CABLE ASSY, SURE FLEX DIN(M)-DIN(M) 10FT	30
W90-0223-701	CABLE ASSY BNC(M) TO SMA(M) RG223 72 IN	135
P25 AND CONVENTIONAL SITE EQUIPMENT		
MASA-NCL7D	Kit,Cable,Ethernet,5ft	30
MASA-SVP25	Site Interface Equipment,P25T MASTR V	30
SA-MD6H	OSCILLATOR, 10MHZ REF,-12VDC,6 PORT	30
SA-MD7E-DC	Controller,P25 MME Data,Addl Site,DC	30
SAMD7Y-DC	KIT, NET SENTRY, CNTL/DATA, DC PWR,WIN10	30
SA-MR1J	RACK,OPEN,84 IN,SEISMIC	30
SASG9N	Feature,P25 Multisite Support	30
MASTR V STATIONS		
MASV-800M1-A	STATION,MASTR V,P25T,800 MHZ,799-817 RX	135
MASV-NCL8Z	Cable,DC Power 60in	6
MASV-NMA6Q	Grounding Shim,28RU	30
MASV-NSG9K	Feature,Software,P25 Phase 2	135
MASV-NZN8R	Panel,Blank Module,MASTR V	84
SV-AT1B	TERMINATION,50 OHM LOAD	139
SV-AW5R-A	POWER AMPLIFIER,LINEAR,800 MHZ	135
SV-CA5J	CABLE,DC POWER,48 IN	68
SV-CL2D	Cable,Xconnect-Baseband Shelf #1	60

Part Number	Description	Quantity
SV-CL2D-DC	Cable,3560v2 Switch, DC Power	30
SV-CL2E	Cable,Xconnect-Baseband Shelf #2	11
SV-CL2N	Cable Assembly RF,RG223,BNC/SMA,5ft	71
SV-CL9V	Kit,Cable,Ch #1,2,9,10,17,18 MASTR V IP	60
SV-CL9W	Kit,Cable,Ch #3,4,11,12,19,20 MASTR V IP	60
SV-CL9X	Kit,Cable,Ch #5,6,13,14,21,22 MASTR V IP	14
SV-CL9Y	Kit,Cable,Ch #7,8,15,16,23,24 MASTR V IP	1
SV-CN1B	POWER STRIP,-48VDC LOW PWR DIST,SEISMIC	30
SV-CN7Z	POWER STRIP,-48VDC HIGH PWR DIST,RACK	40
SV-DW1B	Drawings,IP Simulcast/P25 Trunked	30
SV-MN2Z	PANEL,BLANK,PS CHASSIS	6
SV-MN9S	Panel,Blank,1 RU	30
SV-MR1J	RACK,OPEN,84 IN,SEISMIC	30
SV-NZN8S-DC	Fan Tray,MASTR V, DC	30
SV-PM1C	Processor,Baseband Module,MASTR V	71
SV-PS2P-DC	Power Supply,-48V,DC,MASTR V	141
SV-RB3A	Power Supply Shelf,2nd Position	30
SV-RB3B	Power Supply Shelf,1st Position	30
SV-RB3C	Power Supply Shelf	81
SV-RB3G	Shelf,14-Slot,Open Rack	40
SV-RB3K	Busbar,HPA/PS,MASTR V	135
SV-SP2T	Programming,Multisite	135
SV-ZM1X	KIT,REDUNDANT POWER SUPPLY	40
SV-ZN9K	PANEL,XCONNECT,MASTR V	30
VIDA NETWORKING & SECURITY		
VS-CJ2W	POWER SUPPLY,DC,ISR4221	60
VS-CR1F	ROUTER,ISR4221/K9	60
VS-CU5C	SWITCH,CISCO ME 3400E,DC,24-PORT	31
VS-CU7Z	MODULE,NIM 4PORT LAYER2 GE	60
VSMA7B	KIT,MOUNTING HARDWARE, CISCO ME3400	31
VS-MN3T	KIT, CISCO 4221 ROUTER, SITE MTG	60
VSVS01	VS PROD GRP, CONFIGURED MODEL NUMBER	30
VS-CU5C	SWITCH,CISCO ME 3400E,DC,24-PORT	30
VSMA7B	KIT,MOUNTING HARDWARE, CISCO ME3400	30
VIDA PREMIER CONNECT CORES - SOUTH		
NS-PNSJ	SERVER, VIDA PREMIER, SR10A.4	2
NS-SN5K	SERVICE,SYBASE LICENSE	4
NS-VM2L	SOFTWARE,CONNECT CORE,VM	2
NS-CA5G	CABINET,NSS,42 RU,120V	2
NS-ZM2F	POWER KIT,SR10A.4,VIDA CONNECT,110VAC	2
NS-ZM2E	CABLE KIT, SR10A.4, VIDA CONNECT	2
NS-NP1P	Kit,Automatic Transfer Switch,100-120V	2
NS-NP1L	Cable,IEC to C13 Power Cord (6ft)	16
NS-NP1H	Kit,Seismic Zone 4,Bolt Down	2
NS-DW1U	DRAWINGS,UNITE/CONNECT,SR10A.4	1
VSVS02	VIDA Security, NSC	2
CM-027501-100102	License,Quest Authentication,Server	8
VS-CR99	ROUTER,ISR4351,APPX LIC	2
VS-MN3L	KIT, CISCO 4351 ROUTER, NSC MTG	2
VS-CR92	SWITCH,CATALYST 3650 24P IP	2
VS-CU7Z	MODULE,NIM 4PORT LAYER2 GE	2
MANM-NSG9C	License,Quad Mode Vocoder	2
NS-SH1H	LICENSE,P25 SITE,CONNECT	57
NS-SH1J	LICENSE,P25 SITE TALKPATH,CONNECT	496
NS-SH1M	LICENSE,IP LOGGING RECORDER,CONNECT	6
NS-SH1N	LICENSE,IP LOGGING RECORDER TP,CONNECT	1092
NS-SG2Y	LICENSE,VIDA CONNECT	1
NS-SH1D	LICENSE,P25 APPLICATION,CONNECT	1

Part Number	Description	Quantity
NS-SH1R	LICENSE,LOCATION HA,CONNECT	1
VSSD03	LICENSE,SUMS,ENDPOINT	58
VSSD04	LICENSE,SUMS,CORE	20
NS-SH1A	LICENSE,VIDA CONNECT CONNECTION	1
NS-SN2H	LICENSE,VMWARE,VCENTER,STANDARD	1
NS-SN2J	LICENSE,VMWARE,VCENTER,STANDARD,3YR	1
NS-SG2F	LICENSE,NETWORK FIRST APPLICATION	1
NS-SG2G	LICENSE,NETWORK FIRST SITE	1
NS-SH1E	LICENSE,NETWORKFIRST APPLICATION,CONNECT	1
NS-SH1P	LICENSE,NETWORK FIRST TALKPATH,CONNECT	36
VS-CR84	FIREWALL,ASA5508-X W/SEC+/FIREPOWER	2
VS-SG3U	LICENSE,HOST SECURITY,AV,EPO,QTY 51-100	98
VS-SG3Z	LICENSE,HOST SECURITY(HIDS),51-100	98
VIDA PREMIER CORE - PRIMARY SOUTH		
MM600NS	MANUAL,PRODUCT,VIDA SYS 10A.4 ON CD	1
NS-PNSJ	SERVER, VIDA PREMIER, SR10A.4	1
NS-SN5K	SERVICE,SYBASE LICENSE	2
NS-CA5G	CABINET,NSS,42 RU,120V	1
NS-ZM2A	POWER KIT,SR10A.4,LOC HA/UNITE,110VAC	1
NS-ZM1Y	CABLE KIT,SR10A.4,LOCATION HA/UNITE	1
NS-NP1P	Kit,Automatic Transfer Switch,100-120V	1
NS-NP1L	Cable,IEC to C13 Power Cord (6ft)	8
NS-NP1H	Kit,Seismic Zone 4,Bolt Down	1
MANS-CP9B	Netclock,GPS Master Clock	1
MANS-AN3S	Kit,GPS Antenna,Outdoor,For Netclock	1
MANS-CK1A	Cable,GPS Ant Outdoor,100ft/Netclock	1
NS-DW1T	DRAWINGS,PREMIER,SR10A.4	1
NS-PKGBN	PACKAGE,BEON,FOUNDATION,+10 USERS	1
NMNM01	NM PROD GRP,DUMMY MODEL NUMBER	1
NM-VM2E	SOFTWARE,ISSI GATEWAY,VM	1
NM-SW1A	SW,UNA RNM MOM APPLICATION	1
NM-VM2X	SOFTWARE,STATUSAWARE,100 DEVICES	1
NM-VM2B	SOFTWARE,PREMIER CORE,VM	1
NM-VM2A	SOFTWARE, KMF VM	1
NM-SG8J	LICENSE,ADD AGENCY (2-5),NWK KMF,PREMIER	2
VSVS02	VIDA Security, NSC	1
CM-027501-100102	License,Quest Authentication,Server	13
CM-027501-100103	LICENSE,QUEST AUTHENTICATION,USER,QTY 6	1
VS-CR99	ROUTER,ISR4351,APPX LIC	1
VS-MN3L	KIT, CISCO 4351 ROUTER, NSC MTG	1
VS-CR84	FIREWALL,ASA5508-X W/SEC+/FIREPOWER	1
VS-CR59	VM, FIREPOWER MGMT CENTER, 10 DEVICE	1
VS-CN1J	SERVER,UNITRENDS RS606 BACKUP APPLIANCE	1
VS-CN1H	SERVER,TIBCO LX1025R2 APPLIANCE	1
VSCR21	FIREWALL, ASA5506-X W/SEC+/ANYCON-25USR	1
VS-MA7D	KIT, RACKMNT, 5506	1
VS-CU7Z	MODULE,NIM 4PORT LAYER2 GE	1
VS-CR92	SWITCH,CATALYST 3650 24P IP	1
VS-CR1E	ROUTER,C881-K9,ADV IP SVC	1
VSEPOVM	Software, Epolicy Orch VM	1
VSSD03	LICENSE,SUMS,ENDPOINT	14
VSSD04	LICENSE,SUMS,CORE	50
VS-SG3T	LICENSE,HOST SECURITY,AV,EPO,QTY 26-50	40
VS-SG3Y	LICENSE,HOST SECURITY(HIDS),26-50	40
NS-SG2E	LICENSE,HA,LOCATION,NSC	1
NS-SG2M	LICENSE,P25 APPLICATION	1
MANM-NSG9C	License,Quad Mode Vocoder	1
NM-NG2C	LICENSE, SQL SERVER 2016 STD, BASE 4CORE	1
NS-SN2E	LICENSE,VMWARE,VCENTER,FOUNDATION	1

Part Number	Description	Quantity
NS-SN2F	LICENSE,VMWARE,VCENTER,FOUNDATION,3YR	1
NS-SN2G	LICENSE,ADVANCED CYBER REQTS	1
NM-SH5N	LICENSE,STATUSAWARE,101-500 DEVICES	50
NM-SG9E	LICENSE,ISSI GATEWAY TALKPATH	80
NM-SG9F	LICENSE,ISSI EXTERNAL SYS CONN,PREMIER	4
NM-SH5L	LICENSE, CSSI 3RD PARTY CONSOLE (11+)	75
NS-PNSM	SERVER, VIDA MGMT TERMINAL	1
MANS-NCU3D	Kit,1RU Monitor,Key Board,Mouse,KVM	1
NG-SH2Y	LICENSE,DFSI TALKPATH	24
NG-SW1F	SOFTWARE, ENCOMPASS GW FOR DFSI	1
BN-FW2F	LICENSE,UPGRADE,FOUNDATION TO PREMIER	1
BM-PK1E	FEATURE,NO AES ENCRYPTION	1
SS-SW1E	RPM/RPM2 WITH ANNUAL UPDATES (NO DONGLE)	4
AE/LZY213771/1	SW,Dist Kit,ProFile Manager	4
VS-CR1Y	ROUTER,ISR,C1111-4P,SEC	1
VS-SH6M	LICENSE, ENM P-RTU, + 3 YR SUPP, LRG	1001
VS-SH6R	LICENSE,ENM P-RTU,+3YR SUPP,GEO-HA	1
ANTENNA SYSTEM EQUIPMENT - ALL SITES		
DSCC85-05DS	851-869 MHz 5 Channel Ceramic Cavity Combiner with SMARTtune Power Monitor DIN Output	18
CP00921-8	COMBILENT 700/800 MHz 8 PORT RECEIVER MULTICOUPLER	72
CP00732	COMBILENT TOWER TOP AMP	72
DS7C10F36U-D	764-869 MHz 10 dB Gain Omni Fiberglass Antenna with DIN connector - TX	44
SC412-HF2LDF(D00-E5608)	SC412 746-869 MHZ 11.5 DBD GN NULL - RX	23
DSCC85-04DS	851-869 MHz 4 Channel Ceramic Cavity Combiner with SMARTtune Power Monitor DIN Output	39
SC412-HF2LDF(D000-E5608)	SC412 746-869 MHZ 11.5 DBD GN NULL - RX	3
DS7A08F36U-D	746-869 MHz 8 dB Gain Omni Fiberglass Antenna with DIN connector - TX	28
DS7A06F36U-D	746-869 MHz 6 dB Gain Omni Fiberglass Antenna with DIN connector - RX	22
SC412-HF2LDF(E5608)	SC412 746-869 MHZ 11.5 DBD GN NULL - RX	1
SC473-HF1LDF(D00	SC473 746-869 MHz 3dBd GN HD LowPim - TX	1
SC476-HF1LDF (D00)	SC476 746-869 MHz 6dBd GN HD LowPim - RX	2
DSCC85-07DS	851-869 MHz 7 Channel Ceramic Cavity Combiner with SMARTtune Power Monitor DIN Output	3
DS7A06F36U3D	746-869 MHz 6 dB Gain Omni Fiberglass Antenna with DIN connector 3 Degree downtilt - TX	2
SC479-HF1LDF(D02-E5608)	COLL OMNI 746-869 MHz 9 DB NULL FILL - RX	1
DSCC85-06DS	851-869 MHz 6 Channel Ceramic Cavity Combiner with SMARTtune Power Monitor DIN Output	12
DSCC85-08DS	851-869 MHz 8 Channel Ceramic Cavity Combiner with SMARTtune Power Monitor DIN Output	1
SC473-HF1LDF (D00)	SC473 746-869 MHz 3dBd GN HD LowPim - TX	3
DS7C10F36U3D	764-869 MHz 10 dB Gain Omni Fiberglass Antenna with DIN connector 3 Degree downtilt - TX	2
SC412-HF2LDF(D01-E5608)	SC412 746-869 MHZ 11.5 DBD NUL FILL - RX	2
SC473-HF1LDF(D00)	SC473 746-869 MHz 3dBd GN HD LowPim - TX	3
DS7A06F36U6D	746-869 MHz 6 dB Gain Omni Fiberglass Antenna with DIN connector 6 Degree downtilt - TX	5
SC432D-HF6LDF(D00-I40-	SC432 DUAL 746-869 MHZ 6 DBD GN 40 - TX/RX	1
SC488-HF6LDF(D00)	SC488 746-869 MHZ, 9.5-10 dBd, low PIM, HD, 746-806 MHz - RX	1
EDACS MIGRATION GATEWAY		
MM100MS	MANUAL,PRODUCT,EDACS MIGRATION GATEWAY	1
MS-DF3E	SERVER, EDACS MIGRATION GW, REDUNDANT	1
MS-SG5H	LICENSE,MAX EDACS AD SITES	1
MS-SG1R	LICENSE,IMC MAX SITE CHANNELS	24
MSCL1E	Cable Assembly,Ethernet,10ft	7
MSDF1P	Switch,Cisco 2960,24 Port	1
MS-CJ1X	ADAPTER, DB9F TO DB25F	1
MS-CJ1W	KIT,USB-SERIAL,REDUNDANT EMG SERVER	1

Part Number	Description	Quantity
CA-010006-101	DATA CABLE, 100', EDACS MIGRATION GW	1
VSSD04	LICENSE,SUMS,CORE	12
MS-SG1W	LICENSE,EMG TALKPATH,1-8	8
MS-SG1Y	LICENSE,EMG TALKPATH,9-24	16
SSSV1N	SERVICE,IMC UPGRADE FOR EMG	1
MSGMIM	Kit,System Interface(Gmim) IP Gtwy	1
MSCD1Y	Cable,Data	1
MS-FW2J	SOFTWARE,EDACS MIGRATION GW GVIU	1
MAMS-NAA3D	Module,GVIU,IP Gateway,P25	6
MSCE7R	Cable,Backplane(Short)	6
INTEROPERABILITY GTWY		
MANG-4DVUS	Chassis,4-Slot Interoperability Gateway	3
MANG-GTWY	System Equipment,Interop Gateway	1
MANG-MN2A	Panel,Filler	3
MANG-NAA3E	Module,DVU,UAC,Interoperability Gateway	9
MANG-NCA3L	Cable,Audio,4-Slot Chassis GWB,10ft	36
MANG-NCL8S	Cable,Ethernet,6ft	9
MANG-NFW2C	SOFTWARE,UAC GWB,AES	1
MANG-NMN2U	Bracket Kit, Interoperability Gateway	3
MANG-NPS2J	Power Supply,AC,4-Slot Gateway Chassis	6
MANG-NSN6N	License,DVU OTAR	36
MANG-SN5M	SERVICE,QUAD MODE VOCODER LICENSE	36
VSVS01	VS PROD GRP, CONFIGURED MODEL NUMBER	1
VSCU3H	SWITCH,CISCO 2960 PLUS	1
VSMA6N	KIT,MTG HDWR,CISCO 2960 MASTR III/V CAB	1
MAMM-200NG	Manual,Instal,4-Slot,Intrperabilty Gtwy	1
NCRN		
TB9435S-100H	CHASSIS, TB9400, SINGLE, 100W	204
T01-01103-DAAA	RECITER, TB9400, 148-174MHZ	102
T01-01121-DBBA	LINEAR PWR AMP, TB9400, 148-174MHZ, 100W	102
TBA3004-4100	PMU, TB9000, 48VDC AUX12V	204
TBAS061	SFE CENTRAL VOTER (TB91/94)	102
TBAS071	SFE IP NETWORKING SATELLITE	102
T01-01103-NAAA	RECITER, TB9400, 762-870MHZ	102
T01-01121-NBAA	LINEAR PWR AMP, TB9400, 762-870MHZ, 100W	102
SV-MR1J	RACK,OPEN,84 IN,SEISMIC	68
XE-014893-001	Tape,Vapor-Wrap,3 in,50 ft Roll	34
7699	Kit,Antenna Side Mount,ASPR614	68
CN-015476-001	Connector,N Female,1 5/8 Coax	68
KT-014864-001	Kit,Grounding,W Gnd Lug,For 1 5/8 in Ca	136
CA-015471-001	Cable,Coaxial,1 5/8in,Low Loss Foam	11900
KT-014844-001	Kit,Coax Hoisting Grip,1 5/8 in	68
KT-014872-001	Kit,Hanger,1 5/8 in Cable,Qty 10	340
KT-014869-001	Kit,Angle Adapter,Qty 10	680
KT-014846-001	Kit,Feedthru Boot,1-5/8 in	34
CN-014878-001	Connector,N Female,For 7/8in Coax	68
KT-018357-001	Kit,Grounding For 7/8in Coaxial,60in	136
CA-015474-001	Cable,Coaxial,7/8in,Low Loss Foam	11900
KT-014859-001	Kit,Hoisting Grip,7/8 in Cable	68
KT-014873-001	Kit,Hanger,7/8 in Cable,Qty 10	340
CA-015466-001	Cable,Coaxial,1/2in Superflex	4930
CN-015463-001	Connector,N Male,1/2in Coax	374
CN-015464-001	Connector,N Female,1/2in Coax	68
7242	Filter,Lightening,100-512MHz	68
DB-8922	Load,50 Ohm,1Watt,BNC	34
CN-015462-001	Connector,BNC-M,1/4in Coax,Shrink Sleeve	102
F1PNM-HC	Connector,Straight N-Male,1/4 Superflex	102
CN-014876-001	Connector,N Male,Right Angle	102

Part Number	Description	Quantity
CA-015465-001	Cable,Coaxial,1/4in Cellflex	1530
POWER	Misc power cabling from base station to DC plant	204
TBAA03-13	AUXILIARY SUPPORT BRACKET, TB8/9	408
1200-213	Spectracom Master Os SecureSync	34
CA01-0N0N-3400	GPS Antenna Cable GPS 400 ft.	34
MANS-AN3S	Kit,GPS Antenna,Outdoor,For Netclock	34
VS-CU5C	SWITCH,CISCO ME 3400E,DC,24-PORT	34
VSMA7B	KIT,MOUNTING HARDWARE, CISCO ME3400	34
TX-ANT	VHF transmit antenna	34
RX-ANT	VHF receive antenna	34
TX-CAV	1-CH transmit filter and cavity	136
RX-CAV	1-CH receive cavity and LNA	136
SITE-ON-WHEELS - P25		
MASA-SVP25	Site Interface Equipment,P25T MASTR V	2
MASA-NMR1H	Rack,Open,86 in(Xtra Dp) with support	2
MASA-NCL7D	Kit,Cable,Ethernet,5ft	2
SA-MD6H	OSCILLATOR, 10MHZ REF,-12VDC,6 PORT	2
VSVS01	VS PROD GRP, CONFIGURED MODEL NUMBER	2
VS-CR1F	ROUTER,ISR4221/K9	2
VS-MN3T	KIT, CISCO 4221 ROUTER, SITE MTG	2
VS-CJ2W	POWER SUPPLY,DC,ISR4221	2
VS-CU5C	SWITCH,CISCO ME 3400E,DC,24-PORT	2
VSMA7B	KIT,MOUNTING HARDWARE, CISCO ME3400	2
SAMD7Y-DC	KIT, NET SENTRY, CNTL/DATA, DC PWR,WIN10	2
MANM-NSG8W	Software,Device Manager	2
MASV-700M1	Station,MASTR V,P25T,700MHz	8
MASV-NSG9K	Feature,Software,P25 Phase 2	8
SV-AW5L	Power Amplifier,Linear,700 MHz	8
SV-RB3K	Busbar,HPA/PS,MASTR V	8
SV-PS2P-DC	Power Supply,-48V,DC,MASTR V	8
SV-SP2T	Programming,Multisite	8
SV-PM1C	Processor,Baseband Module,MASTR V	4
SV-CL2N	Cable Assembly RF,RG223,BNC/SMA,5ft	4
SV-CL2D	Cable,Xconnect-Baseband Shelf #1	4
SV-CL9V	Kit,Cable,Ch #1,2,9,10,17,18 MASTR V IP	4
SV-CL9W	Kit,Cable,Ch #3,4,11,12,19,20 MASTR V IP	4
SV-RB3C	Power Supply Shelf	4
SV-RB3B	Power Supply Shelf,1st Position	2
SV-CA5J	CABLE,DC POWER,48 IN	4
SV-DW1B	Drawings,IP Simulcast/P25 Trunked	2
SV-RB3G	Shelf,14-Slot,Open Rack	2
SV-AT1B	TERMINATION,50 OHM LOAD	10
SV-NZN8S-DC	Fan Tray,MASTR V, DC	2
SV-ZN9K	PANEL,XCONNECT,MASTR V	2
SV-MN9S	Panel,Blank,1 RU	2
MASV-NMA6Q	Grounding Shim,28RU	2
SV-CN7Y	POWER STRIP,-48VDC LOW PWR DIST,RACK	2
SV-CN7Z	POWER STRIP,-48VDC HIGH PWR DIST,RACK	2
SV-CL2D-DC	Cable,3560v2 Switch, DC Power	2
SV-RB3A	Power Supply Shelf,2nd Position	2
NM-SG9B	LICENSE,DEVICE MANAGER PREMIUM	2
SV-CG1T	MULTICOUPLER,7/800MHZ,DC,8CH	2
E75-4003-015	ANTENNA,10DB,764-869MHZ,DIN	2
SCAN1W	Power Sensor,403-1000MHz	2
SCCF7X	Cable,RF Sensor,30ft	2
E75-4003-015	ANTENNA,10DB,764-869MHZ,DIN	2
W90-0100-025	CABLE ASSY, SURE FLEX DIN(M)-DIN(M) 10FT	2
E75-4000-143	SURGE FILTER,DC BLOCK 698MHZ-2.7GHZ FEM	2
J90-0114-201	CONN 7-16 DIN MALE COAX CABLE RGHT ANGLE	2

Part Number	Description	Quantity
J29-0110-001	CONN 7-16 DIN MALE FOR 1/2" COAX CABLE	2
CA-015466-001	Cable,Coaxial,1/2in Superflex	140
NM-SCF12-071	Connector,NM For 1/2in Coax,Right Angle	4
W90-0100-009	CABLE ASSY, SURE FLEX N MALE-N MALE 4FT	2
W90-0100-011	CABLE ASSY, SURE FLEX N MALE-N MALE 6FT	2
E75-4000-007	SURGE SUPPRESSOR,800-2500MHZ BROADBAND	2
W90-0223-701	CABLE ASSY BNC(M) TO SMA(M) RG223 72 IN	4
CN-014877-001	Connector,N Female,For 1/2in Coax	4
CN-009256	Connector,NF,7/8in Coax,O-Ring Sealing	4
KT-018357-001	Kit,Grounding For 7/8in Coaxial,60in	12
KT-018357-002	Kit,Grounding For 1/2in Coaxial	12
KT-014859-001	Kit,Hoisting Grip,7/8 in Cable	2
KT-014874-001	Kit,Hoisting Grip,1/2 in Cable	2
CA-015474-001	Cable,Coaxial,7/8in,Low Loss Foam	250
LCF12-50J	Cable,Coaxial,1/2in Low Loss,LCf12-50J	250
CA-015466-001	Cable,Coaxial,1/2in Superflex	200
NM-SCF12-070	Connector,Rapid Fit,SCF12-50 NM	8
KT-014860-001	Kit,Cable Boot,4 in,3 Holes,1/2 in Cable	2
KT-014861-001	Kit,Cable Boot,4 in,For One 7/8 in Cable	2
DSCC85-04DSX	4-ch combiner	2
Multiplexer	Milled duplexer	2
SITE-ON-WHEELS - Conventional		
TB9435S-100H	CHASSIS, TB9400, SINGLE, 100W	1
T01-01103-NAAA	RECITER, TB9400, 762-870MHZ	1
T01-01121-NBAA	LINEAR PWR AMP, TB9400, 762-870MHZ, 100W	1
TBA3004-4100	PMU, TB9000, 48VDC AUX12V	1
TBAS060	SFE DIGITAL FIXED STATION INTERFACE	1
TBAS050	SFE P25 COMMON AIR INTERFACE (CAI)	1
VS-CR1V	ROUTER,ISR,C1111-4P	1
VSCU3H	SWITCH,CISCO 2960 PLUS	1
VSMA6N	KIT,MTG HDWR,CISCO 2960 MASTR III/V CAB	1
SAMD7Y	KIT, NETWORK SENTRY, CONTROL/DATA, WIN10	1
TBAA03-13	AUXILIARY SUPPORT BRACKET, TB8/9	2
SCAN1W	Power Sensor,403-1000MHz	1
SCCF7X	Cable,RF Sensor,30ft	1
E75-4003-015	ANTENNA,10DB,764-869MHZ,DIN	1
W90-0100-025	CABLE ASSY, SURE FLEX DIN(M)-DIN(M) 10FT	1
E75-4000-143	SURGE FILTER,DC BLOCK 698MHZ-2.7GHZ FEM	1
J90-0114-201	CONN 7-16 DIN MALE COAX CABLE RGHT ANGLE	1
J29-0110-001	CONN 7-16 DIN MALE FOR 1/2" COAX CABLE	1
CA-015466-001	Cable,Coaxial,1/2in Superflex	70
NM-SCF12-071	Connector,NM For 1/2in Coax,Right Angle	2
W90-0100-009	CABLE ASSY, SURE FLEX N MALE-N MALE 4FT	1
W90-0100-011	CABLE ASSY, SURE FLEX N MALE-N MALE 6FT	1
E75-4000-007	SURGE SUPPRESSOR,800-2500MHZ BROADBAND	1
W90-0223-701	CABLE ASSY BNC(M) TO SMA(M) RG223 72 IN	2
CN-014877-001	Connector,N Female,For 1/2in Coax	2
CN-009256	Connector,NF,7/8in Coax,O-Ring Sealing	2
KT-018357-001	Kit,Grounding For 7/8in Coaxial,60in	6
KT-018357-002	Kit,Grounding For 1/2in Coaxial	6
KT-014859-001	Kit,Hoisting Grip,7/8 in Cable	1
KT-014874-001	Kit,Hoisting Grip,1/2 in Cable	1
CA-015474-001	Cable,Coaxial,7/8in,Low Loss Foam	125
LCF12-50J	Cable,Coaxial,1/2in Low Loss,LCf12-50J	125
CA-015466-001	Cable,Coaxial,1/2in Superflex	100
NM-SCF12-070	Connector,Rapid Fit,SCF12-50 NM	4
KT-014860-001	Kit,Cable Boot,4 in,3 Holes,1/2 in Cable	1
KT-014861-001	Kit,Cable Boot,4 in,For One 7/8 in Cable	1
Multiplexer	Milled duplexer	1

Part Number	Description	Quantity
E75-4003-015	ANTENNA,10DB,764-869MHZ,DIN	1
15 LOCAL BASE STATIONS		
MAMW-ZN9B	Remote Controller, SP721, Digital, CAN	15
MAMW-ZN9C	Cable,Can 30'	15
MAMW-ZN9F	Microphone,Desktop	15
MAA7-NSU5C	CAN Bus Extender	30
FODSTC	100m Fiber Optic Cable	15
NDIP		
VS-CR1F	ROUTER,ISR4221/K9	24
VS-MN3T	KIT, CISCO 4221 ROUTER, SITE MTG	24
VS-CU7Z	MODULE,NIM 4PORT LAYER2 GE	48
VSCU3H	SWITCH,CISCO 2960 PLUS	24
VSMA6N	KIT,MTG HDWR,CISCO 2960 MASTR III/V CAB	24
VS-CR1F	ROUTER,ISR4221/K9	24
VS-MN3T	KIT, CISCO 4221 ROUTER, SITE MTG	24
VSCU3H	SWITCH,CISCO 2960 PLUS	24
VSMA6N	KIT,MTG HDWR,CISCO 2960 MASTR III/V CAB	24
DISPATCH CONSOLES		
14031-0004-11	WIN 10, 64BIT, LTSB	20
2C-CM22218-0305	HEADSET,OVER-THE HEAD SOLID BOOM	18
CM-022218-001101	License,Vocoder	9
CM-022218-3006WJ	Adapter,6 Wire Jackbox to Headset	18
MM100UD	MANUAL,OP/INSTA/CONFIG,SYMPHONY,CD	9
UD-AB1A	SPEAKER, NANO, SYMPHONY	18
UD-AB1B	JACK BOX, 6 WIRE	18
UD-AB1D	SINGLE FOOTSWITCH, USB, SYMPHONY	15
UD-AB1F	MOUSE, OPTICAL, USB, SCROLL WHEEL	9
UD-AB1G	KEYBOARD, 104 KEY, USB	9
UD-AB1K	CABLE,DISPLAYPORT TO DVI-D,10FT	9
UD-AB1M	DESK MIC, DB9	9
UD-CU6U	MONITOR, 23" CLASS,HIGH DEF	9
2C-CM22218-0604	Power Supply,Ext UPS,60 Hz	9
UD-SG1F	SOFTWARE,REMOTE BATON	8
UD-SG4T	LICENSE,CONVENTIONAL CONTROLS	9
UD-SG4W	LICENSE,AES AND DES LEVEL ENCRYPTION	9
UD-SH2L	LICENSE,MARKER TONE	9
UD-SH4W	LICENSE,SIP,ADD 4 EXTENSIONS,8 CALLS	9
UD-SH5B	LICENSE,BASE SIP,ADD TO ENT/PREM BUNDLE	9
UD-SW1N	SW,SYMPHONY PC APP & WIN 10 IMAGE	12
UD-ZM1E	CONSOLE,BUNDLE,PREMIER,WIN10	9
VS-CR1F	ROUTER,ISR4221/K9	22
VSCU3H	SWITCH,CISCO 2960 PLUS	22
VS-CU7Z	MODULE,NIM 4PORT LAYER2 GE	22
VSMA6N	KIT,MTG HDWR,CISCO 2960 MASTR III/V CAB	22
VS-MN3T	KIT, CISCO 4221 ROUTER, SITE MTG	22
VSSD03	LICENSE,SUMS,ENDPOINT	25
VS-SG3U	LICENSE,HOST SECURITY,AV,EPO,QTY 51-100	25
VS-SG3Z	LICENSE,HOST SECURITY(HIDS),51-100	25
NS-SG2B	LICENSE,CONSOLE	5
NS-SH1F	LICENSE,CONSOLE,CONNECT	9
NS-SH1G, NS-SG2C	LICENSE,CONSOLE TALKPATH,CONNECT	108
	EXACOM LOGGING RECORDER	2
RADIOS		
	Please see Exhibit_6_Price_Schedule for radio information	

Part Number	Description	Quantity
	SPARES	
	SPARE MASTR V	
MASV-800M1-A	STATION,MASTR V,P25T,800 MHZ,799-817 RX	25
MASV-NSG9K	Feature,Software,P25 Phase 2	25
SV-AW5R-A	POWER AMPLIFIER,LINEAR,800 MHZ	30
SV-RB3K	Busbar,HPA/PS,MASTR V	25
SV-PS2P-DC	Power Supply,-48V,DC,MASTR V	25
SV-SP2T	Programming,Multisite	25
SV-RB3B	Power Supply Shelf,1st Position	5
SV-CA5J	CABLE,DC POWER,48 IN	10
SV-DW1B	Drawings,IP Simulcast/P25 Trunked	5
SV-RB3G	Shelf,14-Slot,Open Rack	10
SV-PM1C	Processor,Baseband Module,MASTR V	15
SV-CL2N	Cable Assembly RF,RG223,BNC/SMA,5ft	15
SV-AT1B	TERMINATION,50 OHM LOAD	20
SV-NZN8S-DC	Fan Tray,MASTR V, DC	5
SV-ZN9K	PANEL,XCONNECT,MASTR V	5
SV-CL2D	Cable,Xconnect-Baseband Shelf #1	10
SV-CL9V	Kit,Cable,Ch #1,2,9,10,17,18 MASTR V IP	10
SV-MN9S	Panel,Blank,1 RU	5
MASV-NMA6Q	Grounding Shim,28RU	5
SV-CN7Y	POWER STRIP,-48VDC LOW PWR DIST,RACK	5
SV-CN7Z	POWER STRIP,-48VDC HIGH PWR DIST,RACK	10
SV-CL2D-DC	Cable,3560v2 Switch, DC Power	5
SV-RB3A	Power Supply Shelf,2nd Position	5
SV-RB3C	Power Supply Shelf	15
SV-CL9W	Kit,Cable,Ch #3,4,11,12,19,20 MASTR V IP	10
MASV-NCL8Z	Cable,DC Power 60in	5
SV-CL2E	Cable,Xconnect-Baseband Shelf #2	5
SV-CL9X	Kit,Cable,Ch #5,6,13,14,21,22 MASTR V IP	5
MASV-NZN8R	Panel,Blank Module,MASTR V	50
MASV-NPS9T	Power Supply,120VAC,60Hz,12/24VDC	5
MASV-NRF5D	Preselector,150-160MHz,MASTR V	6
	SPARE ANTENNA SYSTEM EQUIPMENT	
DS7C10F36U-D	700/800 MHz 10dB GAIN TX ANTENNA	
DS7A08F36U-D	700/800 MHz 8 dB GAIN TX ANTENNA	2
SC412-HF2LDF(D00-E5608)	SINCLAIR 700/800 MHz 11.5 RX ANTENNA	5
DSCC85-05DS	5 CHANNEL COMBINER	5
CP00732	COMBILENT 700/800 MHz Tower Top Amp	5
CP00921-8	COMBILENT 700/800 MHz 8 PORT RECEIVER MULTICOUPLER	11
	SPARE P25 AND CONVENTIONAL SITE EQUIPMENT	
MASA-SVP25	Site Interface Equipment,P25T MASTR V	5
MASA-NMR1H	Rack,Open,86 in(Xtra Dp) with support	5
MASA-NCL7D	Kit,Cable,Ethernet,5ft	5
SA-MD6H	OSCILLATOR, 10MHZ REF,-12VDC,6 PORT	5
SASG9N	Feature,P25 Multisite Support	5
SAMD7Y-DC	KIT, NET SENTRY, CNTL/DATA, DC PWR,WIN10	5
	SPARE VIDA NETWORK & SECURITY	
VSVS01	VS PROD GRP, CONFIGURED MODEL NUMBER	5
VS-CR1G	ROUTER,ISR4221-SEC/K9	11
VS-MN3T	KIT, CISCO 4221 ROUTER, SITE MTG	11
VS-CJ2W	POWER SUPPLY,DC,ISR4221	5
VS-CU5C	SWITCH,CISCO ME 3400E,DC,24-PORT	5
VSMA7B	KIT,MOUNTING HARDWARE, CISCO ME3400	5
VS-CU7K	NIM,1PT GE WAN DLMODE RJ45 SFP	6
VS-CU5H	CISCO MODULE,SX MULTIMODE,FIBR	12
VS-CU7Z	MODULE,NIM 4PORT LAYER2 GE	2

Part Number	Description	Quantity
VSCU3H	SWITCH,CISCO 2960 PLUS	7
VSMA6N	KIT,MTG HDWR,CISCO 2960 MASTR III/V CAB	7
VS-CR90	ROUTER,ISR4321 WSEC BDL LIC	1
VS-MN3G	KIT, CISCO 4321 ROUTER, SITE MTG	1
SPARE TB9400 P25 SITE AND STATIONS		
TB9435K4M00000G0BA	RPTR P25 762-870M 100W DC48/12	6
TB9435B3M00000G0BA	RPTR P25 148-174M 100W DC48/12	6
SPARE INTEROPERABILITY GATEWAY		
MANG-NAA3E	Module,DVU,UAC,Interoperability Gateway	3
MANG-NPS2K	Power Supply,DC,4-Slot Gateway Chassis	1
SPARE NETWORK SWITCHING CENTER		
NS-PNSJ	SERVER, VIDA PREMIER, SR10A.4	1
NS-PNSK	SERVER, VIDA CONNECT, SR10A.4	1

TABLE B.1 - TOTAL NSRS PRICE SUMMARY

TABLE B.1 provides a summary of the Total Base Proposal Price broken down by NDOT (Table B.1.A), NV Energy (Table B.1.B) and Washoe County (Table B.1.C) equipment and services. Please see NSRS RFP Pricing Instructions for filling out this pricing spreadsheet.

TABLE B.1.A - NDOT TOTAL PRICE SUMMARY

Harris Radio System Equipment		Discounted Price
System Control Equipment, Software, and Licensing	$	2,625,307.62
Network Monitoring and Fault Management Equipment, Software, and Licensing	$	979,020.00
Radio System Equipment, Software, and Licensing	$	13,848,871.71
Antenna Systems	$	1,775,692.88
Networking Equipment, Software, and Licensing	$	1,185,603.21
Microwave Equipment, Software, and Licensing	$	-
Spare Equipment	$	1,418,674.44
TOTAL EQUIPMENT PRICE	**$**	**21,833,169.86**
NDOT DISPATCH EQUIPMENT	**$**	**1,451,723.25**
NDOT EXTENDED WARRANTY SUPPPORT	**$**	**2,144,642.00**

NDOT GREENFIELD SITES RADIO SYSTEM EQUIPMENT - Table B.11 (without Civils)	**$**	**2,988,389.54**

Additional Discount - Infrastructure (over 26% NASPO Discount)	**$**	**(19,408,548.19)**

NDOT RADIO SYSTEM EQUIPMENT PRICE	**$**	**9,009,376.46**

Radio System Deployment Labor		
System Engineering Services (Harris)	$	4,025,524.00
Migration Services	$	-
Project Management (Harris)	$	1,325,100.00
System Training (Harris)	$	464,555.85
Performance Bond		included
System Equipment Installation Services (Third Party)	$	4,103,765.00
TOTAL SERVICES PRICE	**$**	**9,918,944.85**
NDOT BASE PRICE RF INFRASTRUCTURE AND SERVICES	**$**	**18,928,321.31**

NDOT SUBSCRIBER EQUIPMENT AND SERVICES	**$**	**13,540,810.82**
NDOT DISCOUNTED BASE CONTRACT PRICE	**$**	**32,469,132.13**

NDOT SITE INFRASTRUCTURE AND DEVELOPMENT SERVICES		
Site Infrastructure Civils (Base Proposal and Greenfields) - **ESTIMATE (Third Party)**	$	15,866,655.00
Site Development Services (Base Proposal and Greenfields) - Third Party	$	2,269,882.00
NDOT SITE INFRASTRUCTURE AND DEVELOPMENT PRICE	**$**	**18,136,537.00**
TOTAL NDOT BASE CONTACT PRICE	**$**	**50,605,669.13**

PRICES DO NOT INCLUDE ANY SALES TAXES

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRICES		
	ALL SITES TOTAL	
Site Description --->		
Subsystem Category	**Equipment Discounted**	
System Control Equipment, Software, and Licensing	**Items highlighted in yellow are changes from RFP submission.**	
Primary NSC Premier Server with SW & Lics	$	527,626.66
Primary VIDA Connect Core with SW & Lics FAST	$	1,744,823.06
Secondary VIDA Connect Core with SW & Lics BW	$	340,736.70
Distributed Control Point Licenses	$	-
Asset Manager - CommSHOP 360	$	-
System Management Terminals	$	12,121.20
SUBTOTAL	**$**	**2,625,307.62**
Network Monitoring and Fault Management Equipment, Software, and Licensing		
Network Sentry - Multisite	$	932,400.00
Network Sentry - Simulcast Site	$	-
Network Sentry - Transportable Site	$	46,620.00
	$	-
	$	-
SUBTOTAL	**$**	**979,020.00**
Radio System Equipment, Software and Licensing		
Site Interface Equipment - P25	$	2,183,155.40
MASTR V P25 Trunked Base Station	$	8,999,880.00
84" Open Rack (Seismic)	$	649,116.16
Site Interface Equipment - Conventional	$	278,629.24
TB9435 Conventional Repeater	$	1,738,090.91
	$	-
	$	-
SUBTOTAL	**$**	**13,848,871.71**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRICES		
	ALL SITES TOTAL	
Site Description --->		
Subsystem Category	Equipment Discounted	
Antenna Systems		
P25 Combiner - 4 channel	$	147,375.00
P25 Combiner - 6 channel	$	77,287.50
P25 Combiner - 8 channel	$	8,887.50
P25 Combiner - 10 channel	$	-
P25 Multicoupler - 8 Port	$	121,520.00
P25 Multicoupler - 16 Port	$	4,655.00
Tower Top Amplifier	$	112,275.00
P25 Cables, Connectors, Filters	$	252,383.63
P25 Antennas	$	247,805.00
Conventional Combiner - 800MHz	$	-
Conventional Combiner - VHF	$	315,376.50
Conventional Multicoupler	$	-
Conventional Antenna - 800 MHz	$	-
Conventional Antenna - VHF	$	105,000.00
Conventional Cables, Connectors, Filters	$	253,134.00
P25 Combiner - 5 channel	$	106,312.50
P25 Combiner - 7 channel	$	23,681.25
SUBTOTAL	**$**	**1,775,692.88**
Networking Equipment, Software, and Licensing		
Interop Gateway w/36 talkpaths	$	154,343.65
Interop Gateway w/18 talkpaths	$	-
Cisco Switch DC 24-Port	$	238,527.90
EDACS Migration Gateway	$	157,256.66
ISSI Gateway	$	357,975.00
CSSI Gateway	$	277,500.00
SUBTOTAL	**$**	**1,185,603.21**
Site Infrastructure		
Tower, with Foundation & Construction	$	2,186,776.79
Shelter, with Foundation & Construction	$	3,508,754.46
Site Development - Roads, Fencing, Land Clearing	$	931,260.00
Generator, 40KW with Foundation and LP Tank	$	697,425.00
Electrical Work	$	404,910.00
DC Power	$	1,024,292.50
AC Unit	$	-
Permits, Drawings, Site Acquisition	$	825,585.00
Tower Structural Analysis	$	174,030.00
	$	-
SUBTOTAL	**$**	**9,753,033.75**
Microwave Equipment, Software, and Licensing		
	$	-
	$	-
SUBTOTAL	**$**	**-**
TOTAL EQUIPMENT PRICE	**$**	**30,167,529.17**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	1	Las Vegas SANS		
Site Description --->			Primary VIDA HA Switching Center		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics	$ 713,009.00	1	$ 713,009.00	26.00%	$ 527,626.66
Primary VIDA Connect Core with SW & Lics FAST			$ -	26.00%	$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -	26.00%	$ -
Distributed Control Point Licenses	$ 100,000.00	0	$ -	26.00%	$ -
Asset Manager - CommSHOP 360	$ 187,438.00	0	$ -	0.00%	$ -
System Management Terminals	$ 1,365.00	10	$ 13,650.00	26.00%	$ 10,101.00
SUBTOTAL					**$ 537,727.66**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite			$ -		$ -
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25			$ -		$ -
MASTR V P25 Trunked Base Station			$ -		$ -
84" Open Rack (Seismic)			$ -		$ -
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	1	Las Vegas SANS		
Site Description --->			Primary VIDA HA Switching Center		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel			$ -		$ -
P25 Combiner - 6 channel			$ -		$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port			$ -		$ -
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier			$ -		$ -
P25 Cables, Connectors, Filters			$ -		$ -
P25 Antennas			$ -		$ -
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF			$ -		$ -
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF			$ -		$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Combiner - 5 channel			$ -		$ -
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ -**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths	$ 237,535.00	0	$ -	26.00%	$ -
Interop Gateway w/18 talkpaths	$ 113,992.00	0	$ -	26.00%	$ -
Cisco Switch DC 24-Port			$ -		$ -
EDACS Migration Gateway	$ 212,509.00	1	$ 212,509.00	26.00%	$ 157,256.66
ISSI Gateway	$ 483,750.00	1	$ 483,750.00	26.00%	$ 357,975.00
CSSI Gateway	$ 375,000.00	1	$ 375,000.00	26.00%	$ 277,500.00
SUBTOTAL					**$ 792,731.66**
Site Infrastructure					
Tower, with Foundation & Construction			$ -		$ -
Shelter, with Foundation & Construction			$ -		$ -
Site Development - Roads, Fencing, Land Clearing			$ -		$ -
Generator, 40KW with Foundation and LP Tank			$ -		$ -
Electrical Work			$ -		$ -
DC Power			$ -		$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition			$ -		$ -
Tower Structural Analysis			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 1,330,459.32**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	2	FAST / Beltway		
Site Description --->			Primary/Secondary VIDA Connect Core		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics	$ 175,323.00	0	$ -	26.00%	$ -
Primary VIDA Connect Core with SW & Lics FAST	$ 2,357,869.00	1	$ 2,357,869.00	26.00%	$ 1,744,823.06
Secondary VIDA Connect Core with SW & Lics BW	$ 460,455.00	1	$ 460,455.00	26.00%	$ 340,736.70
Distributed Control Point Licenses	$ 50,000.00	0	$ -	26.00%	$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals	$ 1,365.00	2	$ 2,730.00	26.00%	$ 2,020.20
SUBTOTAL					**$ 2,087,579.96**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite			$ -		$ -
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25			$ -		$ -
MASTR V P25 Trunked Base Station			$ -		$ -
84" Open Rack (Seismic)			$ -		$ -
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	2	FAST / Beltway		
Site Description --->			Primary/Secondary VIDA Connect Core		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel			$ -		$ -
P25 Combiner - 6 channel			$ -		$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port			$ -		$ -
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier			$ -		$ -
P25 Cables, Connectors, Filters			$ -		$ -
P25 Antennas			$ -		$ -
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF			$ -		$ -
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF			$ -		$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Combiner - 5 channel			$ -		$ -
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ -**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths	$ 208,572.50	1	$ 208,572.50	26.00%	$ 154,343.65
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port			$ -		$ -
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 154,343.65**
Site Infrastructure					
Tower, with Foundation & Construction			$ -		$ -
Shelter, with Foundation & Construction			$ -		$ -
Site Development - Roads, Fencing, Land Clearing			$ -		$ -
Generator, 40KW with Foundation and LP Tank			$ -		$ -
Electrical Work			$ -		$ -
DC Power			$ -		$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition			$ -		$ -
Tower Structural Analysis			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 2,241,923.61**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	3	McClellan Peak		
Site Description --->			10 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	0	$ -	26.00%	$ -
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 63,948.00	0	$ -	26.00%	$ -
MASTR V P25 Trunked Base Station	$ 40,540.00	0	$ -	26.00%	$ -
84" Open Rack (Seismic)	$ 4,928.00	0	$ -	26.00%	$ -
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	3	McClellan Peak		
Site Description --->			10 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel			$ -		$ -
P25 Combiner - 6 channel			$ -		$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel	$ 12,916.25	0	$ -	0.00%	$ -
P25 Multicoupler - 8 Port			$ -		$ -
P25 Multicoupler - 16 Port	$ 2,322.50	0	$ -	0.00%	$ -
Tower Top Amplifier	$ 1,871.25	0	$ -	0.00%	$ -
P25 Cables, Connectors, Filters	$ 7,998.00	0	$ -	10.00%	$ -
P25 Antennas	$ 1,736.25	0	$ -	0.00%	$ -
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF			$ -		$ -
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF			$ -		$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Combiner - 5 channel			$ -		$ -
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ -**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port			$ -		$ -
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ -**
Site Infrastructure					
Tower, with Foundation & Construction			$ -		$ -
Shelter, with Foundation & Construction			$ -		$ -
Site Development - Roads, Fencing, Land Clearing			$ -		$ -
Generator, 40KW with Foundation and LP Tank			$ -		$ -
Electrical Work			$ -		$ -
DC Power			$ -		$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition			$ -		$ -
Tower Structural Analysis			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ -**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	4	Spooner		
Site Description --->			4 Channel Multisite (Was 6)		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	4	$ 162,160.00	26.00%	$ 119,998.40
84" Open Rack (Seismic)	$ 4,928.00	2	$ 9,856.00	26.00%	$ 7,293.44
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 163,015.34**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	4	Spooner		
Site Description --->			4 Channel Multisite (Was 6)		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel	$ 4,912.50	1	$ 4,912.50	0.00%	$ 4,912.50
P25 Combiner - 6 channel	$ 8,287.50	0	$ -	0.00%	$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75	0.00%	$ 1,898.75
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 4,540.50	1	$ 4,540.50	10.00%	$ 4,086.45
P25 Antennas	$ 1,123.50	2	$ 2,247.00	0.00%	$ 2,247.00
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF			$ -		$ -
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF			$ -		$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Combiner - 5 channel			$ -		$ -
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 15,015.95**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction			$ -	0.00%	$ -
Shelter, with Foundation & Construction			$ -	0.00%	$ -
Site Development - Roads, Fencing, Land Clearing			$ -	0.00%	$ -
Generator, 40KW with Foundation and LP Tank			$ -	0.00%	$ -
Electrical Work	$ 1,980.00	1	$ 1,980.00	0.00%	$ 1,980.00
DC Power			$ -	0.00%	$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 1,320.00	1	$ 1,320.00	0.00%	$ 1,320.00
Tower Structural Analysis	$ 3,960.00	1	$ 3,960.00		$ 3,960.00
			$ -		$ -
SUBTOTAL					**$ 7,260.00**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 204,806.76**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	5	Eagle Ridge		
Site Description --->			7 Channel Multisite / NCRN		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 53,647.50	1	$ 53,647.50	26.00%	$ 39,699.15
MASTR V P25 Trunked Base Station	$ 40,540.00	7	$ 283,780.00	26.00%	$ 209,997.20
84" Open Rack (Seismic)	$ 4,928.00	4	$ 19,712.00	26.00%	$ 14,586.88
Site Interface Equipment - Conventional	$ 12,872.00	1	$ 12,872.00	26.00%	$ 9,525.28
TB9435 Conventional Repeater	$ 14,064.50	6	$ 84,387.00	26.00%	$ 62,446.38
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 336,254.89**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	5	Eagle Ridge		
Site Description --->			7 Channel Multisite / NCRN		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel			$ -		$ -
P25 Combiner - 6 channel			$ -		$ -
P25 Combiner - 8 channel	$ 10,046.25	0	$ -	0.00%	$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port			$ -		$ -
P25 Multicoupler - 16 Port	$ 2,332.50	1	$ 2,332.50	0.00%	$ 2,332.50
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 4,612.25	1	$ 4,612.25	10.00%	$ 4,151.03
P25 Antennas	$ 1,736.25	2	$ 3,472.50	0.00%	$ 3,472.50
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF	$ 12,320.00	1	$ 12,320.00	10.00%	$ 11,088.00
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF	$ 1,875.00	2	$ 3,750.00	0.00%	$ 3,750.00
Conventional Cables, Connectors, Filters	$ 10,045.00	1	$ 10,045.00	10.00%	$ 9,040.50
P25 Combiner - 5 channel			$ -		$ -
P25 Combiner - 7 channel	$ 7,893.75	1	$ 7,893.75		$ 7,893.75
SUBTOTAL					**$ 43,599.53**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction	$ 128,633.93	1	$ 128,633.93	0.00%	$ 128,633.93
Shelter, with Foundation & Construction	$ 206,397.32	1	$ 206,397.32	0.00%	$ 206,397.32
Site Development - Roads, Fencing, Land Clearing	$ 54,780.00	1	$ 54,780.00	0.00%	$ 54,780.00
Generator, 40KW with Foundation and LP Tank	$ 41,025.00	1	$ 41,025.00	0.00%	$ 41,025.00
Electrical Work	$ 18,810.00	1	$ 18,810.00	0.00%	$ 18,810.00
DC Power	$ 60,252.50	1	$ 60,252.50	0.00%	$ 60,252.50
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 45,225.00	1	$ 45,225.00	0.00%	$ 45,225.00
Tower Structural Analysis			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 555,123.75**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 954,493.63**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	6	Winnemucca Mountain		
Site Description --->			5 Channel Multisite / NCRN		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	5	$ 202,700.00	26.00%	$ 149,998.00
84" Open Rack (Seismic)	$ 4,928.00	4	$ 19,712.00	26.00%	$ 14,586.88
Site Interface Equipment - Conventional	$ 12,872.00	1	$ 12,872.00	26.00%	$ 9,525.28
TB9435 Conventional Repeater	$ 14,064.50	6	$ 84,387.00	26.00%	$ 62,446.38
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 272,280.04**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	6	Winnemucca Mountain		
Site Description --->			5 Channel Multisite / NCRN		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel			$ -		$ -
P25 Combiner - 6 channel	$ 8,287.50	0	$ -	0.00%	$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75	0.00%	$ 1,898.75
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 4,255.25	1	$ 4,255.25	10.00%	$ 3,829.73
P25 Antennas	$ 1,736.25	2	$ 3,472.50	0.00%	$ 3,472.50
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF	$ 12,320.00	1	$ 12,320.00	10.00%	$ 11,088.00
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF	$ 1,875.00	2	$ 3,750.00	0.00%	$ 3,750.00
Conventional Cables, Connectors, Filters	$ 10,045.00	1	$ 10,045.00	10.00%	$ 9,040.50
P25 Combiner - 5 channel	$ 5,906.25	1	$ 5,906.25		$ 5,906.25
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 40,856.98**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction			$ -	0.00%	$ -
Shelter, with Foundation & Construction			$ -	0.00%	$ -
Site Development - Roads, Fencing, Land Clearing			$ -	0.00%	$ -
Generator, 40KW with Foundation and LP Tank			$ -	0.00%	$ -
Electrical Work	$ 1,980.00	1	$ 1,980.00	0.00%	$ 1,980.00
DC Power			$ -	0.00%	$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 1,320.00	1	$ 1,320.00	0.00%	$ 1,320.00
Tower Structural Analysis	$ 3,960.00	1	$ 3,960.00		$ 3,960.00
			$ -		$ -
SUBTOTAL					**$ 7,260.00**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 339,912.48**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	7	Golconda		
Site Description --->			6 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	6	$ 243,240.00	26.00%	$ 179,997.60
84" Open Rack (Seismic)	$ 4,928.00	2	$ 9,856.00	26.00%	$ 7,293.44
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 223,014.54**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	7	Golconda		
Site Description --->			6 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel			$ -		$ -
P25 Combiner - 6 channel	$ 6,900.00	1	$ 6,900.00	0.00%	$ 6,900.00
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75	0.00%	$ 1,898.75
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 5,295.00	1	$ 5,295.00	10.00%	$ 4,765.50
P25 Antennas	$ 2,961.25	2	$ 5,922.50	0.00%	$ 5,922.50
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF			$ -		$ -
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF			$ -		$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Combiner - 5 channel			$ -		$ -
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 21,358.00**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction	$ 128,633.93	1	$ 128,633.93	0.00%	$ 128,633.93
Shelter, with Foundation & Construction	$ 206,397.32	1	$ 206,397.32	0.00%	$ 206,397.32
Site Development - Roads, Fencing, Land Clearing	$ 54,780.00	1	$ 54,780.00	0.00%	$ 54,780.00
Generator, 40KW with Foundation and LP Tank	$ 41,025.00	1	$ 41,025.00	0.00%	$ 41,025.00
Electrical Work	$ 18,810.00	1	$ 18,810.00	0.00%	$ 18,810.00
DC Power	$ 60,252.50	1	$ 60,252.50	0.00%	$ 60,252.50
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 45,225.00	1	$ 45,225.00	0.00%	$ 45,225.00
Tower Structural Analysis			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 555,123.75**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 819,011.76**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	8	Trident Peak		
Site Description --->			4 Channel Multisite / NCRN		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	4	$ 162,160.00	26.00%	$ 119,998.40
84" Open Rack (Seismic)	$ 4,928.00	4	$ 19,712.00	26.00%	$ 14,586.88
Site Interface Equipment - Conventional	$ 12,872.00	1	$ 12,872.00	26.00%	$ 9,525.28
TB9435 Conventional Repeater	$ 14,064.50	6	$ 84,387.00	26.00%	$ 62,446.38
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 242,280.44**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	8	Trident Peak		
Site Description --->			4 Channel Multisite / NCRN		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel	$ 4,912.50	1	$ 4,912.50	0.00%	$ 4,912.50
P25 Combiner - 6 channel			$ -		$ -
P25 Combiner - 8 channel	$ 10,014.25	0	$ -	0.00%	$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75	0.00%	$ 1,898.75
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 4,076.75	1	$ 4,076.75	10.00%	$ 3,669.08
P25 Antennas	$ 1,281.25	2	$ 2,562.50	0.00%	$ 2,562.50
Conventional Combiner - 800MHz	$ 7,950.00	0	$ -	10.00%	$ -
Conventional Combiner - VHF	$ 12,320.00	1	$ 12,320.00	10.00%	$ 11,088.00
Conventional Multicoupler	$ 5,500.00	0	$ -	10.00%	$ -
Conventional Antenna - 800 MHz	$ 2,431.25	0	$ -	10.00%	$ -
Conventional Antenna - VHF	$ 1,875.00	2	$ 3,750.00	0.00%	$ 3,750.00
Conventional Cables, Connectors, Filters	$ 10,045.00	1	$ 10,045.00	10.00%	$ 9,040.50
P25 Combiner - 5 channel			$ -		$ -
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 38,792.58**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction			$ -	0.00%	$ -
Shelter, with Foundation & Construction			$ -	0.00%	$ -
Site Development - Roads, Fencing, Land Clearing			$ -	0.00%	$ -
Generator, 40KW with Foundation and LP Tank			$ -	0.00%	$ -
Electrical Work	$ 1,980.00	1	$ 1,980.00	0.00%	$ 1,980.00
DC Power			$ -	0.00%	$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 1,320.00	1	$ 1,320.00	0.00%	$ 1,320.00
Tower Structural Analysis	$ 3,960.00	1	$ 3,960.00		$ 3,960.00
			$ -		$ -
SUBTOTAL					**$ 7,260.00**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 307,848.48**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	9	Flat Creek		
Site Description --->			4 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	4	$ 162,160.00	26.00%	$ 119,998.40
84" Open Rack (Seismic)	$ 4,928.00	2	$ 9,856.00	26.00%	$ 7,293.44
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 163,015.34**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	9	Flat Creek		
Site Description --->			4 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel	$ 4,912.50	1	$ 4,912.50	0.00%	$ 4,912.50
P25 Combiner - 6 channel			$ -		$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75	0.00%	$ 1,898.75
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 4,143.00	1	$ 4,143.00	10.00%	$ 3,728.70
P25 Antennas	$ 2,961.25	2	$ 5,922.50	0.00%	$ 5,922.50
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF			$ -		$ -
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF			$ -		$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Combiner - 5 channel			$ -		$ -
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 18,333.70**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction	$ 128,633.93	1	$ 128,633.93	0.00%	$ 128,633.93
Shelter, with Foundation & Construction	$ 206,397.32	1	$ 206,397.32	0.00%	$ 206,397.32
Site Development - Roads, Fencing, Land Clearing	$ 54,780.00	1	$ 54,780.00	0.00%	$ 54,780.00
Generator, 40KW with Foundation and LP Tank	$ 41,025.00	1	$ 41,025.00	0.00%	$ 41,025.00
Electrical Work	$ 18,810.00	1	$ 18,810.00	0.00%	$ 18,810.00
DC Power	$ 60,252.50	1	$ 60,252.50	0.00%	$ 60,252.50
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 45,225.00	1	$ 45,225.00	0.00%	$ 45,225.00
Tower Structural Analysis	$ 3,750.00	1	$ 3,750.00		$ 3,750.00
			$ -		$ -
SUBTOTAL					**$ 558,873.75**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 759,738.26**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	10	Imlay		
Site Description --->			6 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	6	$ 243,240.00	26.00%	$ 179,997.60
84" Open Rack (Seismic)	$ 4,928.00	2	$ 9,856.00	26.00%	$ 7,293.44
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 223,014.54**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	10	Imlay		
Site Description --->			6 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel			$ -		$ -
P25 Combiner - 6 channel	$ 6,900.00	1	$ 6,900.00	0.00%	$ 6,900.00
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75	0.00%	$ 1,898.75
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 4,500.00	1	$ 4,500.00	10.00%	$ 4,050.00
P25 Antennas	$ 2,961.25	2	$ 5,922.50	0.00%	$ 5,922.50
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF			$ -		$ -
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF			$ -		$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Combiner - 5 channel			$ -		$ -
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 20,642.50**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction	$ 128,633.93	1	$ 128,633.93	0.00%	$ 128,633.93
Shelter, with Foundation & Construction	$ 206,397.32	1	$ 206,397.32	0.00%	$ 206,397.32
Site Development - Roads, Fencing, Land Clearing	$ 54,780.00	1	$ 54,780.00	0.00%	$ 54,780.00
Generator, 40KW with Foundation and LP Tank	$ 41,025.00	1	$ 41,025.00	0.00%	$ 41,025.00
Electrical Work	$ 18,810.00	1	$ 18,810.00	0.00%	$ 18,810.00
DC Power	$ 60,252.50	1	$ 60,252.50	0.00%	$ 60,252.50
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 45,225.00	1	$ 45,225.00	0.00%	$ 45,225.00
Tower Structural Analysis			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 555,123.75**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 818,296.26**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	11	Toulon Peak		
Site Description --->			6 Channel Multisite / NCRN		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	6	$ 243,240.00	26.00%	$ 179,997.60
84" Open Rack (Seismic)	$ 4,928.00	4	$ 19,712.00	26.00%	$ 14,586.88
Site Interface Equipment - Conventional	$ 12,872.00	1	$ 12,872.00	26.00%	$ 9,525.28
TB9435 Conventional Repeater	$ 14,064.50	6	$ 84,387.00	26.00%	$ 62,446.38
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 302,279.64**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	11	Toulon Peak		
Site Description --->			6 Channel Multisite / NCRN		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel			$ -		$ -
P25 Combiner - 6 channel	$ 6,900.00	1	$ 6,900.00	0.00%	$ 6,900.00
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port			$ -		$ -
P25 Multicoupler - 16 Port	$ 2,322.50	1	$ 2,322.50	0.00%	$ 2,322.50
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 3,970.00	1	$ 3,970.00	10.00%	$ 3,573.00
P25 Antennas	$ 1,798.25	2	$ 3,596.50	0.00%	$ 3,596.50
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF	$ 12,320.00	1	$ 12,320.00	10.00%	$ 11,088.00
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF	$ 1,875.00	2	$ 3,750.00	0.00%	$ 3,750.00
Conventional Cables, Connectors, Filters	$ 10,045.00	1	$ 10,045.00	10.00%	$ 9,040.50
P25 Combiner - 5 channel			$ -		$ -
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 42,141.75**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction			$ -	0.00%	$ -
Shelter, with Foundation & Construction			$ -	0.00%	$ -
Site Development - Roads, Fencing, Land Clearing			$ -	0.00%	$ -
Generator, 40KW with Foundation and LP Tank			$ -	0.00%	$ -
Electrical Work	$ 1,980.00	1	$ 1,980.00	0.00%	$ 1,980.00
DC Power			$ -	0.00%	$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 1,320.00	1	$ 1,320.00	0.00%	$ 1,320.00
Tower Structural Analysis	$ 3,960.00	1	$ 3,960.00		$ 3,960.00
			$ -		$ -
SUBTOTAL					**$ 7,260.00**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 371,196.86**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	12	Wild Oat		
Site Description --->			5 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	5	$ 202,700.00	26.00%	$ 149,998.00
84" Open Rack (Seismic)	$ 4,928.00	2	$ 9,856.00	26.00%	$ 7,293.44
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 193,014.94**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	12	Wild Oat		
Site Description --->			5 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel			$ -		$ -
P25 Combiner - 6 channel	$ 8,287.50	0	$ -	0.00%	$ -
P25 Combiner - 8 channel			$ -	0.00%	$ -
P25 Combiner - 10 channel			$ -	0.00%	$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75	0.00%	$ 1,898.75
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 4,520.25	1	$ 4,520.25	10.00%	$ 4,068.23
P25 Antennas	$ 2,961.25	2	$ 5,922.50	0.00%	$ 5,922.50
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF			$ -		$ -
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF			$ -		$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Combiner - 5 channel	$ 5,906.25	1	$ 5,906.25	0.00%	$ 5,906.25
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 19,666.98**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction			$ -	0.00%	$ -
Shelter, with Foundation & Construction			$ -	0.00%	$ -
Site Development - Roads, Fencing, Land Clearing			$ -	0.00%	$ -
Generator, 40KW with Foundation and LP Tank			$ -	0.00%	$ -
Electrical Work	$ 1,980.00	1	$ 1,980.00	0.00%	$ 1,980.00
DC Power			$ -	0.00%	$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 1,320.00	1	$ 1,320.00	0.00%	$ 1,320.00
Tower Structural Analysis	$ 3,960.00	1	$ 3,960.00		$ 3,960.00
			$ -		$ -
SUBTOTAL					**$ 7,260.00**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 239,457.38**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	13	Pine Grove Mountain		
Site Description --->			5 Channel Multisite / NCRN		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	5	$ 202,700.00	26.00%	$ 149,998.00
84" Open Rack (Seismic)	$ 4,928.00	4	$ 19,712.00	26.00%	$ 14,586.88
Site Interface Equipment - Conventional	$ 12,872.00	1	$ 12,872.00	26.00%	$ 9,525.28
TB9435 Conventional Repeater	$ 14,064.50	6	$ 84,387.00	26.00%	$ 62,446.38
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 272,280.04**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	13	Pine Grove Mountain		
Site Description --->			5 Channel Multisite / NCRN		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel			$ -		$ -
P25 Combiner - 6 channel	$ 8,287.50	0	$ -	0.00%	$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75	0.00%	$ 1,898.75
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 4,387.75	1	$ 4,387.75	10.00%	$ 3,948.98
P25 Antennas	$ 1,798.25	2	$ 3,596.50	0.00%	$ 3,596.50
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF	$ 12,320.00	1	$ 12,320.00	10.00%	$ 11,088.00
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF	$ 1,875.00	2	$ 3,750.00	0.00%	$ 3,750.00
Conventional Cables, Connectors, Filters	$ 10,045.00	1	$ 10,045.00	10.00%	$ 9,040.50
P25 Combiner - 5 channel	$ 5,906.25	1	$ 5,906.25	0.00%	$ 5,906.25
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 41,100.23**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction			$ -	0.00%	$ -
Shelter, with Foundation & Construction			$ -	0.00%	$ -
Site Development - Roads, Fencing, Land Clearing			$ -	0.00%	$ -
Generator, 40KW with Foundation and LP Tank			$ -	0.00%	$ -
Electrical Work	$ 1,980.00	1	$ 1,980.00	0.00%	$ 1,980.00
DC Power			$ -	0.00%	$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 1,320.00	1	$ 1,320.00	0.00%	$ 1,320.00
Tower Structural Analysis	$ 3,960.00	1	$ 3,960.00		$ 3,960.00
			$ -		$ -
SUBTOTAL					**$ 7,260.00**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 340,155.73**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	14	Kinkaid		
Site Description --->			5 Channel Multisite (Was 6)		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	5	$ 202,700.00	26.00%	$ 149,998.00
84" Open Rack (Seismic)	$ 4,928.00	2	$ 9,856.00	26.00%	$ 7,293.44
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 193,014.94**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	14	Kinkaid		
Site Description --->			5 Channel Multisite (Was 6)		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel			$ -		$ -
P25 Combiner - 6 channel	$ 8,287.50	0	$ -	0.00%	$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75	0.00%	$ 1,898.75
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 4,387.75	1	$ 4,387.75	10.00%	$ 3,948.98
P25 Antennas	$ 1,109.25	2	$ 2,218.50	0.00%	$ 2,218.50
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF			$ -		$ -
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF			$ -		$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Combiner - 5 channel	$ 5,906.25	1	$ 5,906.25	0.00%	$ 5,906.25
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 15,843.73**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction	$ 128,633.93	1	$ 128,633.93	0.00%	$ 128,633.93
Shelter, with Foundation & Construction	$ 206,397.32	1	$ 206,397.32	0.00%	$ 206,397.32
Site Development - Roads, Fencing, Land Clearing	$ 54,780.00	1	$ 54,780.00	0.00%	$ 54,780.00
Generator, 40KW with Foundation and LP Tank	$ 41,025.00	1	$ 41,025.00	0.00%	$ 41,025.00
Electrical Work	$ 18,810.00	1	$ 18,810.00	0.00%	$ 18,810.00
DC Power	$ 60,252.50	1	$ 60,252.50	0.00%	$ 60,252.50
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 45,225.00	1	$ 45,225.00	0.00%	$ 45,225.00
Tower Structural Analysis			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 555,123.75**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 783,497.88**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	15	Bald Mountain (West)		
Site Description --->			5 Channel Multisite / NCRN		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	5	$ 202,700.00	26.00%	$ 149,998.00
84" Open Rack (Seismic)	$ 4,928.00	4	$ 19,712.00	26.00%	$ 14,586.88
Site Interface Equipment - Conventional	$ 12,872.00	1	$ 12,872.00	26.00%	$ 9,525.28
TB9435 Conventional Repeater	$ 14,064.50	6	$ 84,387.00	26.00%	$ 62,446.38
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 272,280.04**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	15	Bald Mountain (West)		
Site Description --->			5 Channel Multisite / NCRN		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel			$ -		$ -
P25 Combiner - 6 channel	$ 8,287.50	0	$ -	0.00%	$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75	0.00%	$ 1,898.75
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 4,255.25	1	$ 4,255.25	10.00%	$ 3,829.73
P25 Antennas	$ 1,290.50	2	$ 2,581.00	0.00%	$ 2,581.00
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF	$ 12,320.00	1	$ 12,320.00	10.00%	$ 11,088.00
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF	$ 1,875.00	2	$ 3,750.00	0.00%	$ 3,750.00
Conventional Cables, Connectors, Filters	$ 10,045.00	1	$ 10,045.00	10.00%	$ 9,040.50
P25 Combiner - 5 channel	$ 5,906.25	1	$ 5,906.25		$ 5,906.25
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 39,965.48**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction			$ -	0.00%	$ -
Shelter, with Foundation & Construction			$ -	0.00%	$ -
Site Development - Roads, Fencing, Land Clearing			$ -	0.00%	$ -
Generator, 40KW with Foundation and LP Tank			$ -	0.00%	$ -
Electrical Work	$ 1,980.00	1	$ 1,980.00	0.00%	$ 1,980.00
DC Power			$ -	0.00%	$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 1,320.00	1	$ 1,320.00	0.00%	$ 1,320.00
Tower Structural Analysis	$ 3,960.00	1	$ 3,960.00		$ 3,960.00
			$ -		$ -
SUBTOTAL					**$ 7,260.00**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 339,020.98**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	16	Millers Mountain		
Site Description --->			4 Channel Multisite (Was 5)		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	4	$ 162,160.00	26.00%	$ 119,998.40
84" Open Rack (Seismic)	$ 4,928.00	2	$ 9,856.00	26.00%	$ 7,293.44
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 163,015.34**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	16	Millers Mountain		
Site Description --->			4 Channel Multisite (Was 5)		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel	$ 4,912.50	1	$ 4,912.50	0.00%	$ 4,912.50
P25 Combiner - 6 channel	$ 8,287.50	0	$ -	0.00%	$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75	0.00%	$ 1,898.75
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 4,275.50	1	$ 4,275.50	10.00%	$ 3,847.95
P25 Antennas	$ 1,798.25	2	$ 3,596.50	0.00%	$ 3,596.50
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF			$ -		$ -
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF			$ -		$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Combiner - 5 channel			$ -		$ -
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 16,126.95**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction			$ -	0.00%	$ -
Shelter, with Foundation & Construction			$ -	0.00%	$ -
Site Development - Roads, Fencing, Land Clearing			$ -	0.00%	$ -
Generator, 40KW with Foundation and LP Tank			$ -	0.00%	$ -
Electrical Work	$ 1,980.00	1	$ 1,980.00	0.00%	$ 1,980.00
DC Power			$ -	0.00%	$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 1,320.00	1	$ 1,320.00	0.00%	$ 1,320.00
Tower Structural Analysis	$ 3,960.00	1	$ 3,960.00		$ 3,960.00
			$ -		$ -
SUBTOTAL					**$ 7,260.00**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 205,917.76**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	17	Pilot Peak		
Site Description --->			4 Channel Multisite (Was 6) / NCRN		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	4	$ 162,160.00	26.00%	$ 119,998.40
84" Open Rack (Seismic)	$ 4,928.00	4	$ 19,712.00	26.00%	$ 14,586.88
Site Interface Equipment - Conventional	$ 12,872.00	1	$ 12,872.00	26.00%	$ 9,525.28
TB9435 Conventional Repeater	$ 14,064.50	6	$ 84,387.00	26.00%	$ 62,446.38
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 242,280.44**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	17	Pilot Peak		
Site Description --->			4 Channel Multisite (Was 6) / NCRN		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel	$ 4,912.50	1	$ 4,912.50		$ 4,912.50
P25 Combiner - 6 channel	$ 8,287.50	0	$ -	0.00%	$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel	$ 12,916.25	0	$ -	0.00%	$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75		$ 1,898.75
P25 Multicoupler - 16 Port	$ 2,322.50	0	$ -	0.00%	$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 3,811.75	1	$ 3,811.75	10.00%	$ 3,430.58
P25 Antennas	$ 1,281.25	2	$ 2,562.50	0.00%	$ 2,562.50
Conventional Combiner - 800MHz					$ -
Conventional Combiner - VHF	$ 12,320.00	1	$ 12,320.00	10.00%	$ 11,088.00
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF	$ 1,875.00	2	$ 3,750.00	0.00%	$ 3,750.00
Conventional Cables, Connectors, Filters	$ 10,045.00	1	$ 10,045.00	10.00%	$ 9,040.50
P25 Combiner - 5 channel			$ -		$ -
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 38,554.08**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction			$ -	0.00%	$ -
Shelter, with Foundation & Construction			$ -	0.00%	$ -
Site Development - Roads, Fencing, Land Clearing			$ -	0.00%	$ -
Generator, 40KW with Foundation and LP Tank			$ -	0.00%	$ -
Electrical Work	$ 1,980.00	1	$ 1,980.00	0.00%	$ 1,980.00
DC Power			$ -	0.00%	$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 1,320.00	1	$ 1,320.00	0.00%	$ 1,320.00
Tower Structural Analysis	$ 3,960.00	1	$ 3,960.00		$ 3,960.00
			$ -		$ -
SUBTOTAL					**$ 7,260.00**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 307,609.98**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	18	Fairview Peak		
Site Description --->			5 Channel Multisite / NCRN		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	5	$ 202,700.00	26.00%	$ 149,998.00
84" Open Rack (Seismic)	$ 4,928.00	4	$ 19,712.00	26.00%	$ 14,586.88
Site Interface Equipment - Conventional	$ 12,872.00	1	$ 12,872.00	26.00%	$ 9,525.28
TB9435 Conventional Repeater	$ 14,064.50	6	$ 84,387.00	26.00%	$ 62,446.38
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 272,280.04**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	18	Fairview Peak		
Site Description --->			5 Channel Multisite / NCRN		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel			$ -		$ -
P25 Combiner - 6 channel			$ -		$ -
P25 Combiner - 8 channel	$ 10,046.25	0	$ -	0.00%	$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75	0.00%	$ 1,898.75
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 3,857.75	1	$ 3,857.75	10.00%	$ 3,471.98
P25 Antennas	$ 1,123.50	2	$ 2,247.00	0.00%	$ 2,247.00
Conventional Combiner - 800MHz	$ 7,950.00	0	$ -	10.00%	$ -
Conventional Combiner - VHF	$ 12,320.00	1	$ 12,320.00	10.00%	$ 11,088.00
Conventional Multicoupler	$ 5,500.00	0	$ -	10.00%	$ -
Conventional Antenna - 800 MHz	$ 2,431.25	0	$ -	10.00%	$ -
Conventional Antenna - VHF	$ 1,875.00	2	$ 3,750.00	0.00%	$ 3,750.00
Conventional Cables, Connectors, Filters	$ 10,045.00	1	$ 10,045.00	10.00%	$ 9,040.50
P25 Combiner - 5 channel	$ 5,906.25	1	$ 5,906.25		$ 5,906.25
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 39,273.73**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction	$ 128,633.93	1	$ 128,633.93	0.00%	$ 128,633.93
Shelter, with Foundation & Construction	$ 206,397.32	1	$ 206,397.32	0.00%	$ 206,397.32
Site Development - Roads, Fencing, Land Clearing	$ 54,780.00	1	$ 54,780.00	0.00%	$ 54,780.00
Generator, 40KW with Foundation and LP Tank	$ 41,025.00	1	$ 41,025.00	0.00%	$ 41,025.00
Electrical Work	$ 18,810.00	1	$ 18,810.00	0.00%	$ 18,810.00
DC Power	$ 60,252.50	1	$ 60,252.50	0.00%	$ 60,252.50
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 45,225.00	1	$ 45,225.00	0.00%	$ 45,225.00
Tower Structural Analysis			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 555,123.75**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 886,192.98**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	19	Mount Moses		
Site Description --->			4 Channel Multisite / NCRN		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	4	$ 162,160.00	26.00%	$ 119,998.40
84" Open Rack (Seismic)	$ 4,928.00	4	$ 19,712.00	26.00%	$ 14,586.88
Site Interface Equipment - Conventional	$ 12,872.00	1	$ 12,872.00	26.00%	$ 9,525.28
TB9435 Conventional Repeater	$ 14,064.50	6	$ 84,387.00	26.00%	$ 62,446.38
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 242,280.44**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	19	Mount Moses		
Site Description --->			4 Channel Multisite / NCRN		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel	$ 4,912.50	1	$ 4,912.50	0.00%	$ 4,912.50
P25 Combiner - 6 channel			$ -		$ -
P25 Combiner - 8 channel	$ 10,046.25	0	$ -	0.00%	$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75	0.00%	$ 1,898.75
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 4,275.50	1	$ 4,275.50	10.00%	$ 3,847.95
P25 Antennas	$ 1,281.25	2	$ 2,562.50	0.00%	$ 2,562.50
Conventional Combiner - 800MHz	$ 7,950.00	0	$ -	10.00%	$ -
Conventional Combiner - VHF	$ 12,320.00	1	$ 12,320.00	10.00%	$ 11,088.00
Conventional Multicoupler	$ 5,500.00	0	$ -	10.00%	$ -
Conventional Antenna - 800 MHz	$ 2,431.25	0	$ -	10.00%	$ -
Conventional Antenna - VHF	$ 1,875.00	2	$ 3,750.00	0.00%	$ 3,750.00
Conventional Cables, Connectors, Filters	$ 10,045.00	1	$ 10,045.00	10.00%	$ 9,040.50
P25 Combiner - 5 channel			$ -		$ -
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 38,971.45**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction			$ -	0.00%	$ -
Shelter, with Foundation & Construction			$ -	0.00%	$ -
Site Development - Roads, Fencing, Land Clearing			$ -	0.00%	$ -
Generator, 40KW with Foundation and LP Tank			$ -	0.00%	$ -
Electrical Work	$ 1,980.00	1	$ 1,980.00	0.00%	$ 1,980.00
DC Power			$ -	0.00%	$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 1,320.00	1	$ 1,320.00	0.00%	$ 1,320.00
Tower Structural Analysis	$ 3,960.00	1	$ 3,960.00		$ 3,960.00
			$ -		$ -
SUBTOTAL					**$ 7,260.00**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 308,027.36**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	20	Hickison Summit		
Site Description --->			4 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	4	$ 162,160.00	26.00%	$ 119,998.40
84" Open Rack (Seismic)	$ 4,928.00	2	$ 9,856.00	26.00%	$ 7,293.44
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 163,015.34**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	20	Hickison Summit		
Site Description --->			4 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel	$ 4,912.50	1	$ 4,912.50	0.00%	$ 4,912.50
P25 Combiner - 6 channel			$ -		$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75	0.00%	$ 1,898.75
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 4,275.50	1	$ 4,275.50	10.00%	$ 3,847.95
P25 Antennas	$ 1,736.25	2	$ 3,472.50	0.00%	$ 3,472.50
Conventional Combiner - 800MHz					$ -
Conventional Combiner - VHF					$ -
Conventional Multicoupler					$ -
Conventional Antenna - 800 MHz					$ -
Conventional Antenna - VHF					$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Combiner - 5 channel			$ -		$ -
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 16,002.95**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction			$ -	0.00%	$ -
Shelter, with Foundation & Construction			$ -	0.00%	$ -
Site Development - Roads, Fencing, Land Clearing			$ -	0.00%	$ -
Generator, 40KW with Foundation and LP Tank			$ -	0.00%	$ -
Electrical Work	$ 1,980.00	1	$ 1,980.00	0.00%	$ 1,980.00
DC Power			$ -	0.00%	$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 1,320.00	1	$ 1,320.00	0.00%	$ 1,320.00
Tower Structural Analysis	$ 3,960.00	1	$ 3,960.00		$ 3,960.00
			$ -		$ -
SUBTOTAL					**$ 7,260.00**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 205,793.76**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	21	Austin Mountain		
Site Description --->			4 Channel Multisite (was 5) / NCRN		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	4	$ 162,160.00	26.00%	$ 119,998.40
84" Open Rack (Seismic)	$ 4,928.00	4	$ 19,712.00	26.00%	$ 14,586.88
Site Interface Equipment - Conventional	$ 12,872.00	1	$ 12,872.00	26.00%	$ 9,525.28
TB9435 Conventional Repeater	$ 14,064.50	6	$ 84,387.00	26.00%	$ 62,446.38
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 242,280.44**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	21	Austin Mountain		
Site Description --->			4 Channel Multisite (was 5) / NCRN		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel	$ 4,912.50	1	$ 4,912.50		$ 4,912.50
P25 Combiner - 6 channel	$ 8,287.50	0	$ -	0.00%	$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75	0.00%	$ 1,898.75
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 3,745.50	1	$ 3,745.50	10.00%	$ 3,370.95
P25 Antennas	$ 2,961.25	2	$ 5,922.50	0.00%	$ 5,922.50
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF	$ 12,320.00	1	$ 12,320.00	10.00%	$ 11,088.00
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF	$ 1,875.00	2	$ 3,750.00	0.00%	$ 3,750.00
Conventional Cables, Connectors, Filters	$ 10,045.00	1	$ 10,045.00	10.00%	$ 9,040.50
P25 Combiner - 5 channel			$ -		$ -
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 41,854.45**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction			$ -	0.00%	$ -
Shelter, with Foundation & Construction			$ -	0.00%	$ -
Site Development - Roads, Fencing, Land Clearing			$ -	0.00%	$ -
Generator, 40KW with Foundation and LP Tank			$ -	0.00%	$ -
Electrical Work	$ 1,980.00	1	$ 1,980.00	0.00%	$ 1,980.00
DC Power			$ -	0.00%	$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 1,320.00	1	$ 1,320.00	0.00%	$ 1,320.00
Tower Structural Analysis	$ 3,960.00	1	$ 3,960.00		$ 3,960.00
			$ -		$ -
SUBTOTAL					**$ 7,260.00**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 310,910.36**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	22	New Pass Summit		
Site Description --->			4 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	4	$ 162,160.00	26.00%	$ 119,998.40
84" Open Rack (Seismic)	$ 4,928.00	2	$ 9,856.00	26.00%	$ 7,293.44
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 163,015.34**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	22	New Pass Summit		
Site Description --->			4 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel	$ 4,912.50	1	$ 4,912.50	0.00%	$ 4,912.50
P25 Combiner - 6 channel			$ -		$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75	0.00%	$ 1,898.75
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 4,540.50	1	$ 4,540.50	10.00%	$ 4,086.45
P25 Antennas	$ 1,345.50	2	$ 2,691.00	0.00%	$ 2,691.00
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF			$ -		$ -
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF			$ -		$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Combiner - 5 channel			$ -		$ -
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 15,459.95**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction			$ -	0.00%	$ -
Shelter, with Foundation & Construction			$ -	0.00%	$ -
Site Development - Roads, Fencing, Land Clearing			$ -	0.00%	$ -
Generator, 40KW with Foundation and LP Tank			$ -	0.00%	$ -
Electrical Work	$ 1,980.00	1	$ 1,980.00	0.00%	$ 1,980.00
DC Power			$ -	0.00%	$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 1,320.00	1	$ 1,320.00	0.00%	$ 1,320.00
Tower Structural Analysis	$ 3,960.00	1	$ 3,960.00		$ 3,960.00
			$ -		$ -
SUBTOTAL					**$ 7,260.00**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 205,250.76**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	23	Prospect Peak		
Site Description --->			6 Channel Multisite / NCRN		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	6	$ 243,240.00	26.00%	$ 179,997.60
84" Open Rack (Seismic)	$ 4,928.00	4	$ 19,712.00	26.00%	$ 14,586.88
Site Interface Equipment - Conventional	$ 12,872.00	1	$ 12,872.00	26.00%	$ 9,525.28
TB9435 Conventional Repeater	$ 14,064.50	6	$ 84,387.00	26.00%	$ 62,446.38
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 302,279.64**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	23	Prospect Peak		
Site Description --->			6 Channel Multisite / NCRN		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel			$ -		$ -
P25 Combiner - 6 channel	$ 6,900.00	1	$ 6,900.00	0.00%	$ 6,900.00
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75		$ 1,898.75
P25 Multicoupler - 16 Port	$ 2,322.50	0	$ -	0.00%	$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 4,367.50	1	$ 4,367.50	10.00%	$ 3,930.75
P25 Antennas	$ 1,281.25	2	$ 2,562.50	0.00%	$ 2,562.50
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF	$ 12,320.00	1	$ 12,320.00	10.00%	$ 11,088.00
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF	$ 1,875.00	2	$ 3,750.00	0.00%	$ 3,750.00
Conventional Cables, Connectors, Filters	$ 10,045.00	1	$ 10,045.00	10.00%	$ 9,040.50
P25 Combiner - 5 channel			$ -		$ -
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 41,041.75**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction			$ -	0.00%	$ -
Shelter, with Foundation & Construction			$ -	0.00%	$ -
Site Development - Roads, Fencing, Land Clearing			$ -	0.00%	$ -
Generator, 40KW with Foundation and LP Tank			$ -	0.00%	$ -
Electrical Work	$ 1,980.00	1	$ 1,980.00	0.00%	$ 1,980.00
DC Power			$ -	0.00%	$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 1,320.00	1	$ 1,320.00	0.00%	$ 1,320.00
Tower Structural Analysis	$ 3,960.00	1	$ 3,960.00		$ 3,960.00
			$ -		$ -
SUBTOTAL					**$ 7,260.00**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 370,096.86**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	24	Emigrant		
Site Description --->			4 Channel Multisite (Was 5)		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	4	$ 162,160.00	26.00%	$ 119,998.40
84" Open Rack (Seismic)	$ 4,928.00	2	$ 9,856.00	26.00%	$ 7,293.44
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 163,015.34**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	24	Emigrant		
Site Description --->			4 Channel Multisite (Was 5)		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel	$ 4,912.50	1	$ 4,912.50	0.00%	$ 4,912.50
P25 Combiner - 6 channel	$ 8,287.50	0	$ -	0.00%	$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75	0.00%	$ 1,898.75
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 4,275.50	1	$ 4,275.50	10.00%	$ 3,847.95
P25 Antennas	$ 1,281.25	2	$ 2,562.50	0.00%	$ 2,562.50
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF			$ -		$ -
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF			$ -		$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Combiner - 5 channel			$ -		$ -
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 15,092.95**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction			$ -	0.00%	$ -
Shelter, with Foundation & Construction			$ -	0.00%	$ -
Site Development - Roads, Fencing, Land Clearing			$ -	0.00%	$ -
Generator, 40KW with Foundation and LP Tank			$ -	0.00%	$ -
Electrical Work	$ 1,980.00	1	$ 1,980.00	0.00%	$ 1,980.00
DC Power			$ -	0.00%	$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 1,320.00	1	$ 1,320.00	0.00%	$ 1,320.00
Tower Structural Analysis	$ 3,960.00	1	$ 3,960.00		$ 3,960.00
			$ -		$ -
SUBTOTAL					**$ 7,260.00**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 204,883.76**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	25	Mary's Mountain		
Site Description --->			7 Channel Multisite / NCRN		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 53,647.50	1	$ 53,647.50	26.00%	$ 39,699.15
MASTR V P25 Trunked Base Station	$ 40,540.00	7	$ 283,780.00	26.00%	$ 209,997.20
84" Open Rack (Seismic)	$ 4,928.00	4	$ 19,712.00	26.00%	$ 14,586.88
Site Interface Equipment - Conventional	$ 12,872.00	1	$ 12,872.00	26.00%	$ 9,525.28
TB9435 Conventional Repeater	$ 14,064.50	6	$ 84,387.00	26.00%	$ 62,446.38
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 336,254.89**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	25	Mary's Mountain		
Site Description --->			7 Channel Multisite / NCRN		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel			$ -		$ -
P25 Combiner - 6 channel			$ -		$ -
P25 Combiner - 8 channel	$ 10,046.25	0	$ -	0.00%	$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75		$ 1,898.75
P25 Multicoupler - 16 Port	$ 2,322.50	0	$ -	0.00%	$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 3,996.75	1	$ 3,996.75	10.00%	$ 3,597.08
P25 Antennas	$ 2,961.25	2	$ 5,922.50	0.00%	$ 5,922.50
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF	$ 12,320.00	1	$ 12,320.00	10.00%	$ 11,088.00
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF	$ 1,875.00	2	$ 3,750.00	0.00%	$ 3,750.00
Conventional Cables, Connectors, Filters	$ 10,045.00	1	$ 10,045.00	10.00%	$ 9,040.50
P25 Combiner - 5 channel			$ -		$ -
P25 Combiner - 7 channel	$ 7,893.75	1	$ 7,893.75	0.00%	$ 7,893.75
SUBTOTAL					**$ 45,061.83**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction			$ -	0.00%	$ -
Shelter, with Foundation & Construction			$ -	0.00%	$ -
Site Development - Roads, Fencing, Land Clearing			$ -	0.00%	$ -
Generator, 40KW with Foundation and LP Tank			$ -	0.00%	$ -
Electrical Work	$ 1,980.00	1	$ 1,980.00	0.00%	$ 1,980.00
DC Power			$ -	0.00%	$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 1,320.00	1	$ 1,320.00	0.00%	$ 1,320.00
Tower Structural Analysis	$ 3,960.00	1	$ 3,960.00		$ 3,960.00
			$ -		$ -
SUBTOTAL					**$ 7,260.00**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 408,092.18**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	26	Pennsylvania Hill		
Site Description --->			4 Channel Multisite / NCRN		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	4	$ 162,160.00	26.00%	$ 119,998.40
84" Open Rack (Seismic)	$ 4,928.00	4	$ 19,712.00	26.00%	$ 14,586.88
Site Interface Equipment - Conventional	$ 12,872.00	1	$ 12,872.00	26.00%	$ 9,525.28
TB9435 Conventional Repeater	$ 14,064.50	6	$ 84,387.00	26.00%	$ 62,446.38
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 242,280.44**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	26	Pennsylvania Hill		
Site Description --->			4 Channel Multisite / NCRN		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel	$ 4,912.50	1	$ 4,912.50	0.00%	$ 4,912.50
P25 Combiner - 6 channel			$ -		$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75	0.00%	$ 1,898.75
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 4,275.50	1	$ 4,275.50	10.00%	$ 3,847.95
P25 Antennas	$ 1,798.25	2	$ 3,596.50	0.00%	$ 3,596.50
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF	$ 12,320.00	1	$ 12,320.00	10.00%	$ 11,088.00
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF	$ 1,875.00	2	$ 3,750.00	0.00%	$ 3,750.00
Conventional Cables, Connectors, Filters	$ 10,045.00	1	$ 10,045.00	10.00%	$ 9,040.50
P25 Combiner - 5 channel			$ -		$ -
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 40,005.45**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction			$ -	0.00%	$ -
Shelter, with Foundation & Construction			$ -	0.00%	$ -
Site Development - Roads, Fencing, Land Clearing			$ -	0.00%	$ -
Generator, 40KW with Foundation and LP Tank			$ -	0.00%	$ -
Electrical Work	$ 1,980.00	1	$ 1,980.00	0.00%	$ 1,980.00
DC Power			$ -	0.00%	$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 1,320.00	1	$ 1,320.00	0.00%	$ 1,320.00
Tower Structural Analysis	$ 3,960.00	1	$ 3,960.00		$ 3,960.00
			$ -		$ -
SUBTOTAL					**$ 7,260.00**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 309,061.36**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	27	Ellen Dee Mountain		
Site Description --->			5 Channel Multisite / NCRN		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	5	$ 202,700.00	26.00%	$ 149,998.00
84" Open Rack (Seismic)	$ 4,928.00	4	$ 19,712.00	26.00%	$ 14,586.88
Site Interface Equipment - Conventional	$ 12,872.00	1	$ 12,872.00	26.00%	$ 9,525.28
TB9435 Conventional Repeater	$ 14,064.50	6	$ 84,387.00	26.00%	$ 62,446.38
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 272,280.04**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	27	Ellen Dee Mountain		
Site Description --->			5 Channel Multisite / NCRN		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel			$ -		$ -
P25 Combiner - 6 channel	$ 8,287.50	0	$ -	0.00%	$ -
P25 Combiner - 8 channel			$ -	0.00%	$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75	0.00%	$ 1,898.75
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 3,996.75	1	$ 3,996.75	10.00%	$ 3,597.08
P25 Antennas	$ 1,798.25	2	$ 3,596.50	0.00%	$ 3,596.50
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF	$ 12,320.00	1	$ 12,320.00	10.00%	$ 11,088.00
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF	$ 1,875.00	2	$ 3,750.00	0.00%	$ 3,750.00
Conventional Cables, Connectors, Filters	$ 10,045.00	1	$ 10,045.00	10.00%	$ 9,040.50
P25 Combiner - 5 channel	$ 5,906.25	1	$ 5,906.25		$ 5,906.25
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 40,748.33**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction			$ -	0.00%	$ -
Shelter, with Foundation & Construction			$ -	0.00%	$ -
Site Development - Roads, Fencing, Land Clearing			$ -	0.00%	$ -
Generator, 40KW with Foundation and LP Tank			$ -	0.00%	$ -
Electrical Work	$ 1,980.00	1	$ 1,980.00	0.00%	$ 1,980.00
DC Power			$ -	0.00%	$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 1,320.00	1	$ 1,320.00	0.00%	$ 1,320.00
Tower Structural Analysis	$ 3,960.00	1	$ 3,960.00		$ 3,960.00
			$ -		$ -
SUBTOTAL					**$ 7,260.00**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 339,803.83**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	28	HD Summit		
Site Description --->			4 Channel Multisite (Was 5)		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	4	$ 162,160.00	26.00%	$ 119,998.40
84" Open Rack (Seismic)	$ 4,928.00	2	$ 9,856.00	26.00%	$ 7,293.44
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 163,015.34**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	28	HD Summit		
Site Description --->			4 Channel Multisite (Was 5)		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel	$ 4,912.50	1	$ 4,912.50		$ 4,912.50
P25 Combiner - 6 channel	$ 8,287.50	0	$ -	0.00%	$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75	0.00%	$ 1,898.75
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 4,275.50	1	$ 4,275.50	10.00%	$ 3,847.95
P25 Antennas	$ 2,961.25	2	$ 5,922.50	0.00%	$ 5,922.50
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF			$ -		$ -
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF			$ -		$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Combiner - 5 channel			$ -		$ -
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 18,452.95**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction			$ -	0.00%	$ -
Shelter, with Foundation & Construction			$ -	0.00%	$ -
Site Development - Roads, Fencing, Land Clearing			$ -	0.00%	$ -
Generator, 40KW with Foundation and LP Tank			$ -	0.00%	$ -
Electrical Work	$ 1,980.00	1	$ 1,980.00	0.00%	$ 1,980.00
DC Power			$ -	0.00%	$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 1,320.00	1	$ 1,320.00	0.00%	$ 1,320.00
Tower Structural Analysis	$ 3,960.00	1	$ 3,960.00		$ 3,960.00
			$ -		$ -
SUBTOTAL					**$ 7,260.00**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 208,243.76**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	29	Elko Mountain		
Site Description --->			8 Channel Multisite / NCRN		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 53,647.50	1	$ 53,647.50	26.00%	$ 39,699.15
MASTR V P25 Trunked Base Station	$ 40,540.00	8	$ 324,320.00	26.00%	$ 239,996.80
84" Open Rack (Seismic)	$ 4,928.00	4	$ 19,712.00	26.00%	$ 14,586.88
Site Interface Equipment - Conventional	$ 12,872.00	1	$ 12,872.00	26.00%	$ 9,525.28
TB9435 Conventional Repeater	$ 14,064.50	6	$ 84,387.00	26.00%	$ 62,446.38
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 366,254.49**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	29	Elko Mountain		
Site Description --->			8 Channel Multisite / NCRN		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel			$ -		$ -
P25 Combiner - 6 channel			$ -		$ -
P25 Combiner - 8 channel	$ 8,887.50	1	$ 8,887.50	0.00%	$ 8,887.50
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75	0.00%	$ 1,898.75
P25 Multicoupler - 16 Port	$ 2,322.50	0	$ -	0.00%	$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 4,592.00	1	$ 4,592.00	10.00%	$ 4,132.80
P25 Antennas	$ 2,992.00	2	$ 5,984.00	0.00%	$ 5,984.00
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF	$ 12,320.00	1	$ 12,320.00	10.00%	$ 11,088.00
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF	$ 1,875.00	2	$ 3,750.00	0.00%	$ 3,750.00
Conventional Cables, Connectors, Filters	$ 10,045.00	1	$ 10,045.00	10.00%	$ 9,040.50
P25 Combiner - 5 channel			$ -		$ -
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 46,652.80**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction			$ -	0.00%	$ -
Shelter, with Foundation & Construction			$ -	0.00%	$ -
Site Development - Roads, Fencing, Land Clearing			$ -	0.00%	$ -
Generator, 40KW with Foundation and LP Tank			$ -	0.00%	$ -
Electrical Work	$ 1,980.00	1	$ 1,980.00	0.00%	$ 1,980.00
DC Power			$ -	0.00%	$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 1,320.00	1	$ 1,320.00	0.00%	$ 1,320.00
Tower Structural Analysis	$ 3,960.00	1	$ 3,960.00		$ 3,960.00
			$ -		$ -
SUBTOTAL					**$ 7,260.00**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 439,682.76**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	30	Peavy Hill		
Site Description --->			6 Channel Multisite / NCRN		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	6	$ 243,240.00	26.00%	$ 179,997.60
84" Open Rack (Seismic)	$ 4,928.00	4	$ 19,712.00	26.00%	$ 14,586.88
Site Interface Equipment - Conventional	$ 12,872.00	1	$ 12,872.00	26.00%	$ 9,525.28
TB9435 Conventional Repeater	$ 14,064.50	6	$ 84,387.00	26.00%	$ 62,446.38
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 302,279.64**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	30	Peavy Hill		
Site Description --->			6 Channel Multisite / NCRN		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel			$ -		$ -
P25 Combiner - 6 channel	$ 6,900.00	1	$ 6,900.00	0.00%	$ 6,900.00
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75		$ 1,898.75
P25 Multicoupler - 16 Port	$ 2,322.50	0	$ -	0.00%	$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 4,500.00	1	$ 4,500.00	10.00%	$ 4,050.00
P25 Antennas	$ 1,290.50	2	$ 2,581.00	0.00%	$ 2,581.00
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF	$ 12,320.00	1	$ 12,320.00	10.00%	$ 11,088.00
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF	$ 1,875.00	2	$ 3,750.00	0.00%	$ 3,750.00
Conventional Cables, Connectors, Filters	$ 10,045.00	1	$ 10,045.00	10.00%	$ 9,040.50
P25 Combiner - 5 channel			$ -		$ -
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 41,179.50**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction			$ -	0.00%	$ -
Shelter, with Foundation & Construction			$ -	0.00%	$ -
Site Development - Roads, Fencing, Land Clearing			$ -	0.00%	$ -
Generator, 40KW with Foundation and LP Tank			$ -	0.00%	$ -
Electrical Work	$ 1,980.00	1	$ 1,980.00	0.00%	$ 1,980.00
DC Power			$ -	0.00%	$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 1,320.00	1	$ 1,320.00	0.00%	$ 1,320.00
Tower Structural Analysis	$ 3,960.00	1	$ 3,960.00		$ 3,960.00
			$ -		$ -
SUBTOTAL					**$ 7,260.00**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 370,234.61**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	31	Victoria Peak		
Site Description --->			4 Channel Multisite (Was 5)		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	4	$ 162,160.00	26.00%	$ 119,998.40
84" Open Rack (Seismic)	$ 4,928.00	2	$ 9,856.00	26.00%	$ 7,293.44
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 163,015.34**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	31	Victoria Peak		
Site Description --->			4 Channel Multisite (Was 5)		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel	$ 4,912.50	1	$ 4,912.50		$ 4,912.50
P25 Combiner - 6 channel	$ 8,287.50	0	$ -	0.00%	$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75	0.00%	$ 1,898.75
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 4,010.50	1	$ 4,010.50	10.00%	$ 3,609.45
P25 Antennas	$ 2,961.25	2	$ 5,922.50	0.00%	$ 5,922.50
Conventional Combiner - 800MHz					
Conventional Combiner - VHF					
Conventional Multicoupler					
Conventional Antenna - 800 MHz					
Conventional Antenna - VHF					
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Combiner - 5 channel			$ -		$ -
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 18,214.45**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction			$ -	0.00%	$ -
Shelter, with Foundation & Construction			$ -	0.00%	$ -
Site Development - Roads, Fencing, Land Clearing			$ -	0.00%	$ -
Generator, 40KW with Foundation and LP Tank			$ -	0.00%	$ -
Electrical Work	$ 1,980.00	1	$ 1,980.00	0.00%	$ 1,980.00
DC Power			$ -	0.00%	$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 1,320.00	1	$ 1,320.00	0.00%	$ 1,320.00
Tower Structural Analysis	$ 3,960.00	1	$ 3,960.00		$ 3,960.00
			$ -		$ -
SUBTOTAL					**$ 7,260.00**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 208,005.26**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	32	3-Mile		
Site Description --->			5 Channel Multisite / NCRN		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	5	$ 202,700.00	26.00%	$ 149,998.00
84" Open Rack (Seismic)	$ 4,928.00	4	$ 19,712.00	26.00%	$ 14,586.88
Site Interface Equipment - Conventional	$ 12,872.00	1	$ 12,872.00	26.00%	$ 9,525.28
TB9435 Conventional Repeater	$ 14,064.50	6	$ 84,387.00	26.00%	$ 62,446.38
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 272,280.04**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	32	3-Mile		
Site Description --->			5 Channel Multisite / NCRN		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel			$ -		$ -
P25 Combiner - 6 channel			$ -		$ -
P25 Combiner - 8 channel	$ 10,046.25	0	$ -	0.00%	$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75	0.00%	$ 1,898.75
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 4,189.00	1	$ 4,189.00	10.00%	$ 3,770.10
P25 Antennas	$ 2,961.25	2	$ 5,922.50	0.00%	$ 5,922.50
Conventional Combiner - 800MHz	$ 7,950.00	0	$ -	10.00%	$ -
Conventional Combiner - VHF	$ 12,320.00	1	$ 12,320.00	10.00%	$ 11,088.00
Conventional Multicoupler	$ 5,500.00	0	$ -	10.00%	$ -
Conventional Antenna - 800 MHz	$ 2,431.25	0	$ -	10.00%	$ -
Conventional Antenna - VHF	$ 1,875.00	2	$ 3,750.00	0.00%	$ 3,750.00
Conventional Cables, Connectors, Filters	$ 10,045.00	1	$ 10,045.00	10.00%	$ 9,040.50
P25 Combiner - 5 channel	$ 5,906.25	1	$ 5,906.25		$ 5,906.25
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 43,247.35**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction			$ -	0.00%	$ -
Shelter, with Foundation & Construction			$ -	0.00%	$ -
Site Development - Roads, Fencing, Land Clearing			$ -	0.00%	$ -
Generator, 40KW with Foundation and LP Tank			$ -	0.00%	$ -
Electrical Work	$ 1,980.00	1	$ 1,980.00	0.00%	$ 1,980.00
DC Power			$ -	0.00%	$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 1,320.00	1	$ 1,320.00	0.00%	$ 1,320.00
Tower Structural Analysis	$ 3,960.00	1	$ 3,960.00		$ 3,960.00
			$ -		$ -
SUBTOTAL					**$ 7,260.00**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 342,302.86**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	33	Spruce Mountain		
Site Description --->			6 Channel Multisite / NCRN		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	6	$ 243,240.00	26.00%	$ 179,997.60
84" Open Rack (Seismic)	$ 4,928.00	4	$ 19,712.00	26.00%	$ 14,586.88
Site Interface Equipment - Conventional	$ 12,872.00	1	$ 12,872.00	26.00%	$ 9,525.28
TB9435 Conventional Repeater	$ 14,064.50	6	$ 84,387.00	26.00%	$ 62,446.38
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 302,279.64**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	33	Spruce Mountain		
Site Description --->			6 Channel Multisite / NCRN		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel			$ -		$ -
P25 Combiner - 6 channel	$ 6,900.00	1	$ 6,900.00	0.00%	$ 6,900.00
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75		$ 1,898.75
P25 Multicoupler - 16 Port	$ 2,322.50	0	$ -	0.00%	$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 4,433.75	1	$ 4,433.75	10.00%	$ 3,990.38
P25 Antennas	$ 1,231.25	2	$ 2,462.50	0.00%	$ 2,462.50
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF	$ 12,320.00	1	$ 12,320.00	10.00%	$ 11,088.00
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF	$ 1,875.00	2	$ 3,750.00	0.00%	$ 3,750.00
Conventional Cables, Connectors, Filters	$ 10,045.00	1	$ 10,045.00	10.00%	$ 9,040.50
P25 Combiner - 5 channel			$ -		$ -
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 41,001.38**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction			$ -	0.00%	$ -
Shelter, with Foundation & Construction			$ -	0.00%	$ -
Site Development - Roads, Fencing, Land Clearing			$ -	0.00%	$ -
Generator, 40KW with Foundation and LP Tank			$ -	0.00%	$ -
Electrical Work	$ 1,980.00	1	$ 1,980.00	0.00%	$ 1,980.00
DC Power			$ -	0.00%	$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 1,320.00	1	$ 1,320.00	0.00%	$ 1,320.00
Tower Structural Analysis	$ 3,960.00	1	$ 3,960.00		$ 3,960.00
			$ -		$ -
SUBTOTAL					**$ 7,260.00**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 370,056.48**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	34	Secret Pass		
Site Description --->			4 Channel Multisite (Was 6)		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	4	$ 162,160.00	26.00%	$ 119,998.40
84" Open Rack (Seismic)	$ 4,928.00	2	$ 9,856.00	26.00%	$ 7,293.44
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 163,015.34**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	34	Secret Pass		
Site Description --->			4 Channel Multisite (Was 6)		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel	$ 4,912.50	1	$ 4,912.50		$ 4,912.50
P25 Combiner - 6 channel	$ 8,287.50	0	$ -	0.00%	$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75	0.00%	$ 1,898.75
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 4,275.50	1	$ 4,275.50	10.00%	$ 3,847.95
P25 Antennas	$ 1,281.25	2	$ 2,562.50	0.00%	$ 2,562.50
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF			$ -		$ -
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF			$ -		$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Combiner - 5 channel			$ -		$ -
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 15,092.95**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction			$ -	0.00%	$ -
Shelter, with Foundation & Construction			$ -	0.00%	$ -
Site Development - Roads, Fencing, Land Clearing			$ -	0.00%	$ -
Generator, 40KW with Foundation and LP Tank			$ -	0.00%	$ -
Electrical Work	$ 1,980.00	1	$ 1,980.00	0.00%	$ 1,980.00
DC Power			$ -	0.00%	$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 1,320.00	1	$ 1,320.00	0.00%	$ 1,320.00
Tower Structural Analysis	$ 3,960.00	1	$ 3,960.00		$ 3,960.00
			$ -		$ -
SUBTOTAL					**$ 7,260.00**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 204,883.76**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	35	Loray Hill		
Site Description --->			5 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	5	$ 202,700.00	26.00%	$ 149,998.00
84" Open Rack (Seismic)	$ 4,928.00	2	$ 9,856.00	26.00%	$ 7,293.44
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 193,014.94**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	35	Loray Hill		
Site Description --->			5 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel			$ -		$ -
P25 Combiner - 6 channel	$ 8,287.50	0	$ -	0.00%	$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75	0.00%	$ 1,898.75
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 4,917.75	1	$ 4,917.75	10.00%	$ 4,425.98
P25 Antennas	$ 2,961.25	2	$ 5,922.50	0.00%	$ 5,922.50
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF			$ -		$ -
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF			$ -		$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Combiner - 5 channel	$ 5,906.25	1	$ 5,906.25	0.00%	$ 5,906.25
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 20,024.73**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction			$ -	0.00%	$ -
Shelter, with Foundation & Construction			$ -	0.00%	$ -
Site Development - Roads, Fencing, Land Clearing			$ -	0.00%	$ -
Generator, 40KW with Foundation and LP Tank			$ -	0.00%	$ -
Electrical Work	$ 1,980.00	1	$ 1,980.00	0.00%	$ 1,980.00
DC Power			$ -	0.00%	$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 1,320.00	1	$ 1,320.00	0.00%	$ 1,320.00
Tower Structural Analysis	$ 3,960.00	1	$ 3,960.00		$ 3,960.00
			$ -		$ -
SUBTOTAL					**$ 7,260.00**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 239,815.13**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	36	Rocky Point		
Site Description --->			6 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	6	$ 243,240.00	26.00%	$ 179,997.60
84" Open Rack (Seismic)	$ 4,928.00	2	$ 9,856.00	26.00%	$ 7,293.44
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 223,014.54**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	36	Rocky Point		
Site Description --->			6 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel			$ -		$ -
P25 Combiner - 6 channel	$ 6,900.00	1	$ 6,900.00	0.00%	$ 6,900.00
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75	0.00%	$ 1,898.75
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 4,500.00	1	$ 4,500.00	10.00%	$ 4,050.00
P25 Antennas	$ 1,798.25	2	$ 3,596.50	0.00%	$ 3,596.50
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF			$ -		$ -
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF			$ -		$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Combiner - 5 channel			$ -		$ -
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 18,316.50**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction			$ -	0.00%	$ -
Shelter, with Foundation & Construction			$ -	0.00%	$ -
Site Development - Roads, Fencing, Land Clearing			$ -	0.00%	$ -
Generator, 40KW with Foundation and LP Tank			$ -	0.00%	$ -
Electrical Work	$ 1,980.00	1	$ 1,980.00	0.00%	$ 1,980.00
DC Power			$ -	0.00%	$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 1,320.00	1	$ 1,320.00	0.00%	$ 1,320.00
Tower Structural Analysis	$ 3,960.00	1	$ 3,960.00		$ 3,960.00
			$ -		$ -
SUBTOTAL					**$ 7,260.00**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 268,106.51**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	37	Border Inn		
Site Description --->			4 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	4	$ 162,160.00	26.00%	$ 119,998.40
84" Open Rack (Seismic)	$ 4,928.00	2	$ 9,856.00	26.00%	$ 7,293.44
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 163,015.34**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	37	Border Inn		
Site Description --->			4 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel	$ 4,912.50	1	$ 4,912.50	0.00%	$ 4,912.50
P25 Combiner - 6 channel			$ -		$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75	0.00%	$ 1,898.75
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 4,010.50	1	$ 4,010.50	10.00%	$ 3,609.45
P25 Antennas	$ 1,736.25	2	$ 3,472.50	0.00%	$ 3,472.50
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF			$ -		$ -
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF			$ -		$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Combiner - 5 channel			$ -		$ -
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 15,764.45**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction	$ 128,633.93	1	$ 128,633.93	0.00%	$ 128,633.93
Shelter, with Foundation & Construction	$ 206,397.32	1	$ 206,397.32	0.00%	$ 206,397.32
Site Development - Roads, Fencing, Land Clearing	$ 54,780.00	1	$ 54,780.00	0.00%	$ 54,780.00
Generator, 40KW with Foundation and LP Tank	$ 41,025.00	1	$ 41,025.00	0.00%	$ 41,025.00
Electrical Work	$ 18,810.00	1	$ 18,810.00	0.00%	$ 18,810.00
DC Power	$ 60,252.50	1	$ 60,252.50	0.00%	$ 60,252.50
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 45,225.00	1	$ 45,225.00	0.00%	$ 45,225.00
Tower Structural Analysis			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 555,123.75**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 753,419.01**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	38	Cave Mountain		
Site Description --->			5 Channel Multisite / NCRN		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	5	$ 202,700.00	26.00%	$ 149,998.00
84" Open Rack (Seismic)	$ 4,928.00	4	$ 19,712.00	26.00%	$ 14,586.88
Site Interface Equipment - Conventional	$ 12,872.00	1	$ 12,872.00	26.00%	$ 9,525.28
TB9435 Conventional Repeater	$ 14,064.50	6	$ 84,387.00	26.00%	$ 62,446.38
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 272,280.04**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	38	Cave Mountain		
Site Description --->			5 Channel Multisite / NCRN		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel			$ -		$ -
P25 Combiner - 6 channel	$ 8,287.50	0	$ -	0.00%	$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75	0.00%	$ 1,898.75
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 4,454.00	1	$ 4,454.00	10.00%	$ 4,008.60
P25 Antennas	$ 2,036.75	2	$ 4,073.50	0.00%	$ 4,073.50
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF	$ 12,320.00	1	$ 12,320.00	10.00%	$ 11,088.00
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF	$ 1,875.00	2	$ 3,750.00	0.00%	$ 3,750.00
Conventional Cables, Connectors, Filters	$ 10,045.00	1	$ 10,045.00	10.00%	$ 9,040.50
P25 Combiner - 5 channel	$ 5,906.25	1	$ 5,906.25		$ 5,906.25
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 41,636.85**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction			$ -	0.00%	$ -
Shelter, with Foundation & Construction			$ -	0.00%	$ -
Site Development - Roads, Fencing, Land Clearing			$ -	0.00%	$ -
Generator, 40KW with Foundation and LP Tank			$ -	0.00%	$ -
Electrical Work	$ 1,980.00	1	$ 1,980.00	0.00%	$ 1,980.00
DC Power			$ -	0.00%	$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 1,320.00	1	$ 1,320.00	0.00%	$ 1,320.00
Tower Structural Analysis	$ 3,960.00	1	$ 3,960.00		$ 3,960.00
			$ -		$ -
SUBTOTAL					**$ 7,260.00**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 340,692.36**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	39	Squaw Peak		
Site Description --->			4 Channel Multisite / NCRN		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	4	$ 162,160.00	26.00%	$ 119,998.40
84" Open Rack (Seismic)	$ 4,928.00	4	$ 19,712.00	26.00%	$ 14,586.88
Site Interface Equipment - Conventional	$ 8,927.50	1	$ 12,872.00	26.00%	$ 9,525.28
TB9435 Conventional Repeater	$ 11,000.00	6	$ 14,064.50	26.00%	$ 10,407.73
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 190,241.79**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	39	Squaw Peak		
Site Description --->			4 Channel Multisite / NCRN		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel	$ 4,912.50	1	$ 4,912.50	0.00%	$ 4,912.50
P25 Combiner - 6 channel			$ -		$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75	0.00%	$ 1,898.75
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 4,341.75	1	$ 4,341.75	10.00%	$ 3,907.58
P25 Antennas	$ 2,961.25	2	$ 5,922.50	0.00%	$ 5,922.50
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF	$ 12,320.00	1	$ 12,320.00	10.00%	$ 11,088.00
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF	$ 1,875.00	2	$ 3,750.00	0.00%	$ 3,750.00
Conventional Cables, Connectors, Filters	$ 10,045.00	1	$ 10,045.00	10.00%	$ 9,040.50
P25 Combiner - 5 channel			$ -		$ -
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 42,391.08**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction			$ -	0.00%	$ -
Shelter, with Foundation & Construction			$ -	0.00%	$ -
Site Development - Roads, Fencing, Land Clearing			$ -	0.00%	$ -
Generator, 40KW with Foundation and LP Tank			$ -	0.00%	$ -
Electrical Work	$ 1,980.00	1	$ 1,980.00	0.00%	$ 1,980.00
DC Power			$ -	0.00%	$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 1,320.00	1	$ 1,320.00	0.00%	$ 1,320.00
Tower Structural Analysis	$ 3,960.00	1	$ 3,960.00		$ 3,960.00
			$ -		$ -
SUBTOTAL					**$ 7,260.00**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 259,408.33**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	40	Kimberly		
Site Description --->			5 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	5	$ 202,700.00	26.00%	$ 149,998.00
84" Open Rack (Seismic)	$ 4,928.00	2	$ 9,856.00	26.00%	$ 7,293.44
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 193,014.94**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	40	Kimberly		
Site Description --->			5 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel			$ -		$ -
P25 Combiner - 6 channel	$ 8,287.50	0	$ -	0.00%	$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75	0.00%	$ 1,898.75
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 4,387.75	1	$ 4,387.75	10.00%	$ 3,948.98
P25 Antennas	$ 1,798.25	2	$ 3,596.50	0.00%	$ 3,596.50
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF			$ -		$ -
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF			$ -		$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Combiner - 5 channel	$ 5,906.25	1	$ 5,906.25	0.00%	$ 5,906.25
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 17,221.73**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction			$ -	0.00%	$ -
Shelter, with Foundation & Construction			$ -	0.00%	$ -
Site Development - Roads, Fencing, Land Clearing			$ -	0.00%	$ -
Generator, 40KW with Foundation and LP Tank			$ -	0.00%	$ -
Electrical Work	$ 1,980.00	1	$ 1,980.00	0.00%	$ 1,980.00
DC Power			$ -	0.00%	$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 1,320.00	1	$ 1,320.00	0.00%	$ 1,320.00
Tower Structural Analysis	$ 3,960.00	1	$ 3,960.00		$ 3,960.00
			$ -		$ -
SUBTOTAL					**$ 7,260.00**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 237,012.13**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	41	Buster Mountain		
Site Description --->			4 Channel Multisite (Was 5)		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	4	$ 162,160.00	26.00%	$ 119,998.40
84" Open Rack (Seismic)	$ 4,928.00	2	$ 9,856.00	26.00%	$ 7,293.44
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 163,015.34**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	41	Buster Mountain		
Site Description --->			4 Channel Multisite (Was 5)		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel	$ 4,912.50	1	$ 4,912.50	0.00%	$ 4,912.50
P25 Combiner - 6 channel	$ 8,287.50	0	$ -	0.00%	$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75	0.00%	$ 1,898.75
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 4,010.50	1	$ 4,010.50	10.00%	$ 3,609.45
P25 Antennas	$ 1,290.50	2	$ 2,581.00	0.00%	$ 2,581.00
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF			$ -		$ -
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF			$ -		$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Combiner - 5 channel			$ -		$ -
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 14,872.95**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction	$ 128,633.93	1	$ 128,633.93	0.00%	$ 128,633.93
Shelter, with Foundation & Construction	$ 206,397.32	1	$ 206,397.32	0.00%	$ 206,397.32
Site Development - Roads, Fencing, Land Clearing	$ 54,780.00	1	$ 54,780.00	0.00%	$ 54,780.00
Generator, 40KW with Foundation and LP Tank	$ 41,025.00	1	$ 41,025.00	0.00%	$ 41,025.00
Electrical Work	$ 18,810.00	1	$ 18,810.00	0.00%	$ 18,810.00
DC Power	$ 60,252.50	1	$ 60,252.50	0.00%	$ 60,252.50
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 45,225.00	1	$ 45,225.00	0.00%	$ 45,225.00
Tower Structural Analysis			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 555,123.75**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 752,527.51**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	42	Palmetto		
Site Description --->			5 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	5	$ 202,700.00	26.00%	$ 149,998.00
84" Open Rack (Seismic)	$ 4,928.00	2	$ 9,856.00	26.00%	$ 7,293.44
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 193,014.94**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	42	Palmetto		
Site Description --->			5 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel			$ -		$ -
P25 Combiner - 6 channel	$ 8,287.50	0	$ -	0.00%	$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75	0.00%	$ 1,898.75
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 4,275.50	1	$ 4,275.50	10.00%	$ 3,847.95
P25 Antennas	$ 1,341.25	2	$ 2,682.50	0.00%	$ 2,682.50
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF			$ -		$ -
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF			$ -		$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Combiner - 5 channel	$ 5,906.25	1	$ 5,906.25	0.00%	$ 5,906.25
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 16,206.70**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction			$ -	0.00%	$ -
Shelter, with Foundation & Construction			$ -	0.00%	$ -
Site Development - Roads, Fencing, Land Clearing			$ -	0.00%	$ -
Generator, 40KW with Foundation and LP Tank			$ -	0.00%	$ -
Electrical Work	$ 1,980.00	1	$ 1,980.00	0.00%	$ 1,980.00
DC Power			$ -	0.00%	$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 1,320.00	1	$ 1,320.00	0.00%	$ 1,320.00
Tower Structural Analysis	$ 3,960.00	1	$ 3,960.00		$ 3,960.00
			$ -		$ -
SUBTOTAL					**$ 7,260.00**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 235,997.11**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	43	Montezuma Peak		
Site Description --->			5 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	5	$ 202,700.00	26.00%	$ 149,998.00
84" Open Rack (Seismic)	$ 4,928.00	2	$ 9,856.00	26.00%	$ 7,293.44
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 193,014.94**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	43	Montezuma Peak		
Site Description --->			5 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel			$ -		$ -
P25 Combiner - 6 channel	$ 8,287.50	0	$ -	0.00%	$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75	0.00%	$ 1,898.75
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 4,143.00	1	$ 4,143.00	10.00%	$ 3,728.70
P25 Antennas	$ 1,341.25	2	$ 2,682.50	0.00%	$ 2,682.50
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF			$ -		$ -
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF			$ -		$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Combiner - 5 channel	$ 5,906.25	1	$ 5,906.25	0.00%	$ 5,906.25
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 16,087.45**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction			$ -	0.00%	$ -
Shelter, with Foundation & Construction			$ -	0.00%	$ -
Site Development - Roads, Fencing, Land Clearing			$ -	0.00%	$ -
Generator, 40KW with Foundation and LP Tank			$ -	0.00%	$ -
Electrical Work	$ 1,980.00	1	$ 1,980.00	0.00%	$ 1,980.00
DC Power			$ -	0.00%	$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 1,320.00	1	$ 1,320.00	0.00%	$ 1,320.00
Tower Structural Analysis	$ 3,960.00	1	$ 3,960.00		$ 3,960.00
			$ -		$ -
SUBTOTAL					**$ 7,260.00**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 235,877.86**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	44	Mount Brock		
Site Description --->			7 Channel Multisite / NCRN		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 53,647.50	1	$ 53,647.50	26.00%	$ 39,699.15
MASTR V P25 Trunked Base Station	$ 40,540.00	7	$ 283,780.00	26.00%	$ 209,997.20
84" Open Rack (Seismic)	$ 4,928.00	4	$ 19,712.00	26.00%	$ 14,586.88
Site Interface Equipment - Conventional	$ 12,872.00	1	$ 12,872.00	26.00%	$ 9,525.28
TB9435 Conventional Repeater	$ 14,064.50	6	$ 84,387.00	26.00%	$ 62,446.38
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 336,254.89**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	44	Mount Brock		
Site Description --->			7 Channel Multisite / NCRN		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel			$ -		$ -
P25 Combiner - 6 channel			$ -		$ -
P25 Combiner - 8 channel	$ 10,046.25	0	$ -	0.00%	$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75		$ 1,898.75
P25 Multicoupler - 16 Port	$ 2,322.50	0	$ -	0.00%	$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 5,009.75	1	$ 5,009.75	10.00%	$ 4,508.78
P25 Antennas	$ 1,281.25	2	$ 2,562.50	0.00%	$ 2,562.50
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF	$ 12,320.00	1	$ 12,320.00	10.00%	$ 11,088.00
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF	$ 1,875.00	2	$ 3,750.00	0.00%	$ 3,750.00
Conventional Cables, Connectors, Filters	$ 10,045.00	1	$ 10,045.00	10.00%	$ 9,040.50
P25 Combiner - 5 channel			$ -		$ -
P25 Combiner - 7 channel	$ 7,893.75	1	$ 7,893.75	0.00%	$ 7,893.75
SUBTOTAL					**$ 42,613.53**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction	$ 128,633.93	1	$ 128,633.93	0.00%	$ 128,633.93
Shelter, with Foundation & Construction	$ 206,397.32	1	$ 206,397.32	0.00%	$ 206,397.32
Site Development - Roads, Fencing, Land Clearing	$ 54,780.00	1	$ 54,780.00	0.00%	$ 54,780.00
Generator, 40KW with Foundation and LP Tank	$ 41,025.00	1	$ 41,025.00	0.00%	$ 41,025.00
Electrical Work	$ 18,810.00	1	$ 18,810.00	0.00%	$ 18,810.00
DC Power	$ 60,252.50	1	$ 60,252.50	0.00%	$ 60,252.50
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 45,225.00	1	$ 45,225.00	0.00%	$ 45,225.00
Tower Structural Analysis			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 555,123.75**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 953,507.63**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	45	Fitzpatrick Peak		
Site Description --->			4 Channel Multisite (Was 5) / NCRN		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	5	$ 202,700.00	26.00%	$ 149,998.00
84" Open Rack (Seismic)	$ 4,928.00	4	$ 19,712.00	26.00%	$ 14,586.88
Site Interface Equipment - Conventional	$ 12,872.00	1	$ 12,872.00	26.00%	$ 9,525.28
TB9435 Conventional Repeater	$ 14,064.50	6	$ 84,387.00	26.00%	$ 62,446.38
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 272,280.04**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	45	Fitzpatrick Peak		
Site Description --->			4 Channel Multisite (Was 5) / NCRN		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel	$ 4,912.50	1	$ 4,912.50	0.00%	$ 4,912.50
P25 Combiner - 6 channel	$ 8,287.50	0	$ -	0.00%	$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75	0.00%	$ 1,898.75
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 3,811.75	1	$ 3,811.75	10.00%	$ 3,430.58
P25 Antennas	$ 1,775.00	2	$ 3,550.00	0.00%	$ 3,550.00
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF	$ 12,320.00	1	$ 12,320.00	10.00%	$ 11,088.00
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF	$ 1,875.00	2	$ 3,750.00	0.00%	$ 3,750.00
Conventional Cables, Connectors, Filters	$ 10,045.00	1	$ 10,045.00	10.00%	$ 9,040.50
P25 Combiner - 5 channel			$ -		$ -
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 39,541.58**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction	$ 128,633.93	1	$ 128,633.93	0.00%	$ 128,633.93
Shelter, with Foundation & Construction	$ 206,397.32	1	$ 206,397.32	0.00%	$ 206,397.32
Site Development - Roads, Fencing, Land Clearing	$ 54,780.00	1	$ 54,780.00	0.00%	$ 54,780.00
Generator, 40KW with Foundation and LP Tank	$ 41,025.00	1	$ 41,025.00	0.00%	$ 41,025.00
Electrical Work	$ 18,810.00	1	$ 18,810.00	0.00%	$ 18,810.00
DC Power	$ 60,252.50	1	$ 60,252.50	0.00%	$ 60,252.50
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 45,225.00	1	$ 45,225.00	0.00%	$ 45,225.00
Tower Structural Analysis			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 555,123.75**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 886,460.83**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	46	Warm Springs Mountain		
Site Description --->			5 Channel Multisite / NCRN		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	5	$ 202,700.00	26.00%	$ 149,998.00
84" Open Rack (Seismic)	$ 4,928.00	4	$ 19,712.00	26.00%	$ 14,586.88
Site Interface Equipment - Conventional	$ 12,872.00	1	$ 12,872.00	26.00%	$ 9,525.28
TB9435 Conventional Repeater	$ 14,064.50	6	$ 84,387.00	26.00%	$ 62,446.38
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 272,280.04**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	46	Warm Springs Mountain		
Site Description --->			5 Channel Multisite / NCRN		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel			$ -		$ -
P25 Combiner - 6 channel	$ 8,287.50	0	$ -	0.00%	$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75	0.00%	$ 1,898.75
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 4,122.25	1	$ 4,122.25	10.00%	$ 3,710.03
P25 Antennas	$ 1,281.25	2	$ 2,562.50	0.00%	$ 2,562.50
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF	$ 12,320.00	1	$ 12,320.00	10.00%	$ 11,088.00
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF	$ 1,875.00	2	$ 3,750.00	0.00%	$ 3,750.00
Conventional Cables, Connectors, Filters	$ 10,045.00	1	$ 10,045.00	10.00%	$ 9,040.50
P25 Combiner - 5 channel	$ 5,906.25	1	$ 5,906.25	0.00%	$ 5,906.25
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 39,827.28**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction			$ -	0.00%	$ -
Shelter, with Foundation & Construction			$ -	0.00%	$ -
Site Development - Roads, Fencing, Land Clearing			$ -	0.00%	$ -
Generator, 40KW with Foundation and LP Tank			$ -	0.00%	$ -
Electrical Work	$ 1,980.00	1	$ 1,980.00	0.00%	$ 1,980.00
DC Power			$ -	0.00%	$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 1,320.00	1	$ 1,320.00	0.00%	$ 1,320.00
Tower Structural Analysis	$ 3,960.00	1	$ 3,960.00		$ 3,960.00
			$ -		$ -
SUBTOTAL					**$ 7,260.00**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 338,882.78**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	47	Sawtooth		
Site Description --->			6 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	6	$ 243,240.00	26.00%	$ 179,997.60
84" Open Rack (Seismic)	$ 4,928.00	2	$ 9,856.00	26.00%	$ 7,293.44
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 223,014.54**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	47	Sawtooth		
Site Description --->			6 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel			$ -		$ -
P25 Combiner - 6 channel	$ 6,900.00	1	$ 6,900.00	0.00%	$ 6,900.00
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75	0.00%	$ 1,898.75
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 3,837.50	1	$ 3,837.50	10.00%	$ 3,453.75
P25 Antennas	$ 2,494.00	1	$ 2,494.00	0.00%	$ 2,494.00
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF			$ -		$ -
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF			$ -		$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Combiner - 5 channel			$ -		$ -
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 16,617.75**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction			$ -	0.00%	$ -
Shelter, with Foundation & Construction			$ -	0.00%	$ -
Site Development - Roads, Fencing, Land Clearing			$ -	0.00%	$ -
Generator, 40KW with Foundation and LP Tank			$ -	0.00%	$ -
Electrical Work	$ 1,980.00	1	$ 1,980.00	0.00%	$ 1,980.00
DC Power			$ -	0.00%	$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 1,320.00	1	$ 1,320.00	0.00%	$ 1,320.00
Tower Structural Analysis	$ 3,960.00	1	$ 3,960.00		$ 3,960.00
			$ -		$ -
SUBTOTAL					**$ 7,260.00**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 266,407.76**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	48	Sober		
Site Description --->			4 Channel Multisite / NCRN		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	4	$ 162,160.00	26.00%	$ 119,998.40
84" Open Rack (Seismic)	$ 4,928.00	4	$ 19,712.00	26.00%	$ 14,586.88
Site Interface Equipment - Conventional	$ 12,872.00	1	$ 12,872.00	26.00%	$ 9,525.28
TB9435 Conventional Repeater	$ 14,064.50	6	$ 84,387.00	26.00%	$ 62,446.38
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 242,280.44**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	48	Sober		
Site Description --->			4 Channel Multisite / NCRN		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel	$ 4,912.50	1	$ 4,912.50	0.00%	$ 4,912.50
P25 Combiner - 6 channel			$ -		$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75	0.00%	$ 1,898.75
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 3,878.00	1	$ 3,878.00	10.00%	$ 3,490.20
P25 Antennas	$ 1,281.25	2	$ 2,562.50	0.00%	$ 2,562.50
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF	$ 12,320.00	1	$ 12,320.00	10.00%	$ 11,088.00
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF	$ 1,875.00	2	$ 3,750.00	0.00%	$ 3,750.00
Conventional Cables, Connectors, Filters	$ 10,045.00	1	$ 10,045.00	10.00%	$ 9,040.50
P25 Combiner - 5 channel			$ -		$ -
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 38,613.70**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction			$ -	0.00%	$ -
Shelter, with Foundation & Construction			$ -	0.00%	$ -
Site Development - Roads, Fencing, Land Clearing			$ -	0.00%	$ -
Generator, 40KW with Foundation and LP Tank			$ -	0.00%	$ -
Electrical Work	$ 1,980.00	1	$ 1,980.00	0.00%	$ 1,980.00
DC Power			$ -	0.00%	$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 1,320.00	1	$ 1,320.00	0.00%	$ 1,320.00
Tower Structural Analysis	$ 3,960.00	1	$ 3,960.00		$ 3,960.00
			$ -		$ -
SUBTOTAL					**$ 7,260.00**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 307,669.61**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	49	Mercury		
Site Description --->			5 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	5	$ 202,700.00	26.00%	$ 149,998.00
84" Open Rack (Seismic)	$ 4,928.00	2	$ 9,856.00	26.00%	$ 7,293.44
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 193,014.94**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	49	Mercury		
Site Description --->			5 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel			$ -		$ -
P25 Combiner - 6 channel	$ 8,287.50	0	$ -	0.00%	$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75	0.00%	$ 1,898.75
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 4,255.25	1	$ 4,255.25	10.00%	$ 3,829.73
P25 Antennas	$ 1,798.25	2	$ 3,596.50	0.00%	$ 3,596.50
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF			$ -		$ -
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF			$ -		$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Combiner - 5 channel	$ 5,906.25	1	$ 5,906.25	0.00%	$ 5,906.25
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 17,102.48**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction			$ -	0.00%	$ -
Shelter, with Foundation & Construction			$ -	0.00%	$ -
Site Development - Roads, Fencing, Land Clearing			$ -	0.00%	$ -
Generator, 40KW with Foundation and LP Tank			$ -	0.00%	$ -
Electrical Work	$ 1,980.00	1	$ 1,980.00	0.00%	$ 1,980.00
DC Power			$ -	0.00%	$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 1,320.00	1	$ 1,320.00	0.00%	$ 1,320.00
Tower Structural Analysis	$ 3,960.00	1	$ 3,960.00		$ 3,960.00
			$ -		$ -
SUBTOTAL					**$ 7,260.00**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 236,892.88**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	50	Schader		
Site Description --->			4 Channel Multisite (Was 6)		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	4	$ 162,160.00	26.00%	$ 119,998.40
84" Open Rack (Seismic)	$ 4,928.00	2	$ 9,856.00	26.00%	$ 7,293.44
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 163,015.34**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	50	Schader		
Site Description --->			4 Channel Multisite (Was 6)		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel	$ 4,912.50	1	$ 4,912.50	0.00%	$ 4,912.50
P25 Combiner - 6 channel	$ 8,287.50	0	$ -	0.00%	$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75	0.00%	$ 1,898.75
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 4,341.75	1	$ 4,341.75	10.00%	$ 3,907.58
P25 Antennas	$ 2,961.25	2	$ 5,922.50	0.00%	$ 5,922.50
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF			$ -		$ -
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF			$ -		$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Combiner - 5 channel			$ -		$ -
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 18,512.58**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction			$ -	0.00%	$ -
Shelter, with Foundation & Construction			$ -	0.00%	$ -
Site Development - Roads, Fencing, Land Clearing			$ -	0.00%	$ -
Generator, 40KW with Foundation and LP Tank			$ -	0.00%	$ -
Electrical Work	$ 1,980.00	1	$ 1,980.00	0.00%	$ 1,980.00
DC Power			$ -	0.00%	$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 1,320.00	1	$ 1,320.00	0.00%	$ 1,320.00
Tower Structural Analysis	$ 3,960.00	1	$ 3,960.00		$ 3,960.00
			$ -		$ -
SUBTOTAL					**$ 7,260.00**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 208,303.38**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	51	Amargosa Valley		
Site Description --->			4 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	4	$ 162,160.00	26.00%	$ 119,998.40
84" Open Rack (Seismic)	$ 4,928.00	2	$ 9,856.00	26.00%	$ 7,293.44
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 163,015.34**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	51	Amargosa Valley		
Site Description --->			4 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel	$ 4,912.50	1	$ 4,912.50	0.00%	$ 4,912.50
P25 Combiner - 6 channel			$ -		$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75	0.00%	$ 1,898.75
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 5,600.50	1	$ 5,600.50	10.00%	$ 5,040.45
P25 Antennas	$ 1,281.25	2	$ 2,562.50	0.00%	$ 2,562.50
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF			$ -		$ -
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF			$ -		$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Combiner - 5 channel			$ -		$ -
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 16,285.45**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction	$ 128,633.93	1	$ 128,633.93	0.00%	$ 128,633.93
Shelter, with Foundation & Construction	$ 206,397.32	1	$ 206,397.32	0.00%	$ 206,397.32
Site Development - Roads, Fencing, Land Clearing	$ 54,780.00	1	$ 54,780.00	0.00%	$ 54,780.00
Generator, 40KW with Foundation and LP Tank	$ 41,025.00	1	$ 41,025.00	0.00%	$ 41,025.00
Electrical Work	$ 18,810.00	1	$ 18,810.00	0.00%	$ 18,810.00
DC Power	$ 60,252.50	1	$ 60,252.50	0.00%	$ 60,252.50
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 45,225.00	1	$ 45,225.00	0.00%	$ 45,225.00
Tower Structural Analysis			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 555,123.75**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 753,940.01**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	52	Ragged Ridge		
Site Description --->			4 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	4	$ 162,160.00	26.00%	$ 119,998.40
84" Open Rack (Seismic)	$ 4,928.00	2	$ 9,856.00	26.00%	$ 7,293.44
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 163,015.34**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	52	Ragged Ridge		
Site Description --->			4 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel	$ 4,912.50	1	$ 4,912.50	0.00%	$ 4,912.50
P25 Combiner - 6 channel			$ -		$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75	0.00%	$ 1,898.75
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 4,275.50	1	$ 4,275.50	10.00%	$ 3,847.95
P25 Antennas	$ 1,625.00	2	$ 3,250.00	0.00%	$ 3,250.00
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF			$ -		$ -
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF			$ -		$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Combiner - 5 channel			$ -		$ -
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 15,780.45**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction			$ -	0.00%	$ -
Shelter, with Foundation & Construction			$ -	0.00%	$ -
Site Development - Roads, Fencing, Land Clearing			$ -	0.00%	$ -
Generator, 40KW with Foundation and LP Tank			$ -	0.00%	$ -
Electrical Work	$ 1,980.00	1	$ 1,980.00	0.00%	$ 1,980.00
DC Power			$ -	0.00%	$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 1,320.00	1	$ 1,320.00	0.00%	$ 1,320.00
Tower Structural Analysis	$ 3,960.00	1	$ 3,960.00		$ 3,960.00
			$ -		$ -
SUBTOTAL					**$ 7,260.00**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 205,571.26**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	53	Timber Mountain		
Site Description --->			4 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	4	$ 162,160.00	26.00%	$ 119,998.40
84" Open Rack (Seismic)	$ 4,928.00	2	$ 9,856.00	26.00%	$ 7,293.44
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 163,015.34**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	53	Timber Mountain		
Site Description --->			4 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel	$ 4,912.50	1	$ 4,912.50	0.00%	$ 4,912.50
P25 Combiner - 6 channel			$ -		$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75	0.00%	$ 1,898.75
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 4,010.50	1	$ 4,010.50	10.00%	$ 3,609.45
P25 Antennas	$ 1,231.25	2	$ 2,462.50	0.00%	$ 2,462.50
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF			$ -		$ -
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF			$ -		$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Combiner - 5 channel			$ -		$ -
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 14,754.45**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction			$ -	0.00%	$ -
Shelter, with Foundation & Construction			$ -	0.00%	$ -
Site Development - Roads, Fencing, Land Clearing			$ -	0.00%	$ -
Generator, 40KW with Foundation and LP Tank			$ -	0.00%	$ -
Electrical Work	$ 1,980.00	1	$ 1,980.00	0.00%	$ 1,980.00
DC Power			$ -	0.00%	$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 1,320.00	1	$ 1,320.00	0.00%	$ 1,320.00
Tower Structural Analysis	$ 3,960.00	1	$ 3,960.00		$ 3,960.00
			$ -		$ -
SUBTOTAL					**$ 7,260.00**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 204,545.26**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	54	Sunnyside		
Site Description --->			5 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	5	$ 202,700.00	26.00%	$ 149,998.00
84" Open Rack (Seismic)	$ 4,928.00	2	$ 9,856.00	26.00%	$ 7,293.44
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 193,014.94**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	54	Sunnyside		
Site Description --->			5 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel			$ -		$ -
P25 Combiner - 6 channel	$ 8,287.50	0	$ -	0.00%	$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75	0.00%	$ 1,898.75
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 4,255.25	1	$ 4,255.25	10.00%	$ 3,829.73
P25 Antennas	$ 2,961.25	2	$ 5,922.50	0.00%	$ 5,922.50
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF			$ -		$ -
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF			$ -		$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Combiner - 5 channel	$ 5,906.25	1	$ 5,906.25	0.00%	$ 5,906.25
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 19,428.48**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction			$ -	0.00%	$ -
Shelter, with Foundation & Construction			$ -	0.00%	$ -
Site Development - Roads, Fencing, Land Clearing			$ -	0.00%	$ -
Generator, 40KW with Foundation and LP Tank			$ -	0.00%	$ -
Electrical Work	$ 1,980.00	1	$ 1,980.00	0.00%	$ 1,980.00
DC Power			$ -	0.00%	$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 1,320.00	1	$ 1,320.00	0.00%	$ 1,320.00
Tower Structural Analysis	$ 3,960.00	1	$ 3,960.00		$ 3,960.00
			$ -		$ -
SUBTOTAL					**$ 7,260.00**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 239,218.88**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	55	Currant Summit		
Site Description --->			4 Channel Multisite (Was 5) / NCRN		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	4	$ 162,160.00	26.00%	$ 119,998.40
84" Open Rack (Seismic)	$ 4,928.00	4	$ 19,712.00	26.00%	$ 14,586.88
Site Interface Equipment - Conventional	$ 12,872.00	1	$ 12,872.00	26.00%	$ 9,525.28
TB9435 Conventional Repeater	$ 14,064.50	6	$ 84,387.00	26.00%	$ 62,446.38
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 242,280.44**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	55	Currant Summit		
Site Description --->			4 Channel Multisite (Was 5) / NCRN		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel	$ 4,912.50	1	$ 4,912.50	0.00%	$ 4,912.50
P25 Combiner - 6 channel			$ -		$ -
P25 Combiner - 8 channel	$ 10,046.25	0	$ -	0.00%	$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75	0.00%	$ 1,898.75
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 4,209.25	1	$ 4,209.25	10.00%	$ 3,788.33
P25 Antennas	$ 2,961.25	2	$ 5,922.50	0.00%	$ 5,922.50
Conventional Combiner - 800MHz	$ 7,950.00	0	$ -	10.00%	$ -
Conventional Combiner - VHF	$ 12,320.00	1	$ 12,320.00	10.00%	$ 11,088.00
Conventional Multicoupler	$ 5,500.00	0	$ -	10.00%	$ -
Conventional Antenna - 800 MHz	$ 2,431.25	0	$ -	10.00%	$ -
Conventional Antenna - VHF	$ 1,875.00	2	$ 3,750.00	0.00%	$ 3,750.00
Conventional Cables, Connectors, Filters	$ 10,045.00	1	$ 10,045.00	10.00%	$ 9,040.50
P25 Combiner - 5 channel			$ -		$ -
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 42,271.83**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction	$ 128,633.93	1	$ 128,633.93	0.00%	$ 128,633.93
Shelter, with Foundation & Construction	$ 206,397.32	1	$ 206,397.32	0.00%	$ 206,397.32
Site Development - Roads, Fencing, Land Clearing	$ 54,780.00	1	$ 54,780.00	0.00%	$ 54,780.00
Generator, 40KW with Foundation and LP Tank	$ 41,025.00	1	$ 41,025.00	0.00%	$ 41,025.00
Electrical Work	$ 18,810.00	1	$ 18,810.00	0.00%	$ 18,810.00
DC Power	$ 60,252.50	1	$ 60,252.50	0.00%	$ 60,252.50
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 45,225.00	1	$ 45,225.00	0.00%	$ 45,225.00
Tower Structural Analysis			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 555,123.75**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 859,191.48**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	56	Highland Peak		
Site Description --->			5 Channel Multisite / NCRN		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	5	$ 202,700.00	26.00%	$ 149,998.00
84" Open Rack (Seismic)	$ 4,928.00	4	$ 19,712.00	26.00%	$ 14,586.88
Site Interface Equipment - Conventional	$ 12,872.00	1	$ 12,872.00	26.00%	$ 9,525.28
TB9435 Conventional Repeater	$ 14,064.50	6	$ 84,387.00	26.00%	$ 62,446.38
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 272,280.04**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	56	Highland Peak		
Site Description --->			5 Channel Multisite / NCRN		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel			$ -		$ -
P25 Combiner - 6 channel	$ 8,287.50	0	$ -	0.00%	$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75	0.00%	$ 1,898.75
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 4,122.25	1	$ 4,122.25	10.00%	$ 3,710.03
P25 Antennas	$ 3,106.00	2	$ 6,212.00	0.00%	$ 6,212.00
Conventional Combiner - 800MHz					$ -
Conventional Combiner - VHF	$ 12,320.00	1	$ 12,320.00	10.00%	$ 11,088.00
Conventional Multicoupler					$ -
Conventional Antenna - 800 MHz					$ -
Conventional Antenna - VHF	$ 1,875.00	2	$ 3,750.00	0.00%	$ 3,750.00
Conventional Cables, Connectors, Filters	$ 10,045.00	1	$ 10,045.00	10.00%	$ 9,040.50
P25 Combiner - 5 channel	$ 5,906.25	1	$ 5,906.25	0.00%	$ 5,906.25
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 43,476.78**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction	$ 128,633.93	1	$ 128,633.93	0.00%	$ 128,633.93
Shelter, with Foundation & Construction	$ 206,397.32	1	$ 206,397.32	0.00%	$ 206,397.32
Site Development - Roads, Fencing, Land Clearing	$ 54,780.00	1	$ 54,780.00	0.00%	$ 54,780.00
Generator, 40KW with Foundation and LP Tank	$ 41,025.00	1	$ 41,025.00	0.00%	$ 41,025.00
Electrical Work	$ 18,810.00	1	$ 18,810.00	0.00%	$ 18,810.00
DC Power	$ 60,252.50	1	$ 60,252.50	0.00%	$ 60,252.50
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 45,225.00	1	$ 45,225.00	0.00%	$ 45,225.00
Tower Structural Analysis			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 555,123.75**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 890,396.03**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	57	Mount Wilson		
Site Description --->			5 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	5	$ 202,700.00	26.00%	$ 149,998.00
84" Open Rack (Seismic)	$ 4,928.00	2	$ 9,856.00	26.00%	$ 7,293.44
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 193,014.94**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	57	Mount Wilson		
Site Description --->			5 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel			$ -		$ -
P25 Combiner - 6 channel	$ 8,287.50	1	$ 8,287.50	0.00%	$ 8,287.50
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75	0.00%	$ 1,898.75
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 4,387.75	1	$ 4,387.75	10.00%	$ 3,948.98
P25 Antennas	$ 1,798.25	2	$ 3,596.50	0.00%	$ 3,596.50
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF			$ -		$ -
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF			$ -		$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Combiner - 5 channel	$ 5,906.25	1	$ 5,906.25	0.00%	$ 5,906.25
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 25,509.23**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction			$ -	0.00%	$ -
Shelter, with Foundation & Construction			$ -	0.00%	$ -
Site Development - Roads, Fencing, Land Clearing			$ -	0.00%	$ -
Generator, 40KW with Foundation and LP Tank			$ -	0.00%	$ -
Electrical Work	$ 1,980.00	1	$ 1,980.00	0.00%	$ 1,980.00
DC Power			$ -	0.00%	$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 1,320.00	1	$ 1,320.00	0.00%	$ 1,320.00
Tower Structural Analysis	$ 3,960.00	1	$ 3,960.00		$ 3,960.00
			$ -		$ -
SUBTOTAL					**$ 7,260.00**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 245,299.63**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	58	Alamo		
Site Description --->			4 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	4	$ 162,160.00	26.00%	$ 119,998.40
84" Open Rack (Seismic)	$ 4,928.00	2	$ 9,856.00	26.00%	$ 7,293.44
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 163,015.34**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	58	Alamo		
Site Description --->			4 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel	$ 4,912.50	1	$ 4,912.50	0.00%	$ 4,912.50
P25 Combiner - 6 channel			$ -		$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75	0.00%	$ 1,898.75
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 4,275.50	1	$ 4,275.50	10.00%	$ 3,847.95
P25 Antennas	$ 2,961.25	2	$ 5,922.50	0.00%	$ 5,922.50
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF			$ -		$ -
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF			$ -		$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Combiner - 5 channel			$ -		$ -
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 18,452.95**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction	$ 128,633.93	1	$ 128,633.93	0.00%	$ 128,633.93
Shelter, with Foundation & Construction	$ 206,397.32	1	$ 206,397.32	0.00%	$ 206,397.32
Site Development - Roads, Fencing, Land Clearing	$ 54,780.00	1	$ 54,780.00	0.00%	$ 54,780.00
Generator, 40KW with Foundation and LP Tank	$ 41,025.00	1	$ 41,025.00	0.00%	$ 41,025.00
Electrical Work	$ 18,810.00	1	$ 18,810.00	0.00%	$ 18,810.00
DC Power	$ 60,252.50	1	$ 60,252.50	0.00%	$ 60,252.50
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 45,225.00	1	$ 45,225.00	0.00%	$ 45,225.00
Tower Structural Analysis			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 555,123.75**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 756,107.51**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	59	Caliente		
Site Description --->			4 Channel Multisite (Was 5) / NCRN		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	4	$ 162,160.00	26.00%	$ 119,998.40
84" Open Rack (Seismic)	$ 4,928.00	4	$ 19,712.00	26.00%	$ 14,586.88
Site Interface Equipment - Conventional	$ 12,872.00	1	$ 12,872.00	26.00%	$ 9,525.28
TB9435 Conventional Repeater	$ 14,064.50	6	$ 84,387.00	26.00%	$ 62,446.38
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 242,280.44**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	59	Caliente		
Site Description --->			4 Channel Multisite (Was 5) / NCRN		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel	$ 4,912.50	1	$ 4,912.50	0.00%	$ 4,912.50
P25 Combiner - 6 channel			$ -		$ -
P25 Combiner - 8 channel	$ 10,046.25	0	$ -	0.00%	$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75	0.00%	$ 1,898.75
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 5,070.50	1	$ 5,070.50	10.00%	$ 4,563.45
P25 Antennas	$ 1,798.25	2	$ 3,596.50	0.00%	$ 3,596.50
Conventional Combiner - 800MHz	$ 7,950.00	0	$ -	10.00%	$ -
Conventional Combiner - VHF	$ 12,320.00	1	$ 12,320.00	10.00%	$ 11,088.00
Conventional Multicoupler	$ 5,500.00	0	$ -	10.00%	$ -
Conventional Antenna - 800 MHz	$ 2,431.25	0	$ -	10.00%	$ -
Conventional Antenna - VHF	$ 1,875.00	2	$ 3,750.00	0.00%	$ 3,750.00
Conventional Cables, Connectors, Filters	$ 10,045.00	1	$ 10,045.00	10.00%	$ 9,040.50
P25 Combiner - 5 channel			$ -		$ -
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 40,720.95**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction	$ 128,633.93	1	$ 128,633.93	0.00%	$ 128,633.93
Shelter, with Foundation & Construction	$ 206,397.32	1	$ 206,397.32	0.00%	$ 206,397.32
Site Development - Roads, Fencing, Land Clearing	$ 54,780.00	1	$ 54,780.00	0.00%	$ 54,780.00
Generator, 40KW with Foundation and LP Tank	$ 41,025.00	1	$ 41,025.00	0.00%	$ 41,025.00
Electrical Work	$ 18,810.00	1	$ 18,810.00	0.00%	$ 18,810.00
DC Power	$ 60,252.50	1	$ 60,252.50	0.00%	$ 60,252.50
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 45,225.00	1	$ 45,225.00	0.00%	$ 45,225.00
Tower Structural Analysis			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 555,123.75**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 857,640.61**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	60	Mount Irish		
Site Description --->			4 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	4	$ 162,160.00	26.00%	$ 119,998.40
84" Open Rack (Seismic)	$ 4,928.00	2	$ 9,856.00	26.00%	$ 7,293.44
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 163,015.34**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	60	Mount Irish		
Site Description --->			4 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel	$ 4,912.50	1	$ 4,912.50	0.00%	$ 4,912.50
P25 Combiner - 6 channel			$ -		$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75	0.00%	$ 1,898.75
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 4,341.75	1	$ 4,341.75	10.00%	$ 3,907.58
P25 Antennas	$ 1,625.00	2	$ 3,250.00	0.00%	$ 3,250.00
Conventional Combiner - 800MHz					$ -
Conventional Combiner - VHF					$ -
Conventional Multicoupler					$ -
Conventional Antenna - 800 MHz					$ -
Conventional Antenna - VHF					$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Combiner - 5 channel			$ -		$ -
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 15,840.08**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction			$ -	0.00%	$ -
Shelter, with Foundation & Construction			$ -	0.00%	$ -
Site Development - Roads, Fencing, Land Clearing			$ -	0.00%	$ -
Generator, 40KW with Foundation and LP Tank			$ -	0.00%	$ -
Electrical Work	$ 1,980.00	1	$ 1,980.00	0.00%	$ 1,980.00
DC Power			$ -	0.00%	$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 1,320.00	1	$ 1,320.00	0.00%	$ 1,320.00
Tower Structural Analysis	$ 3,960.00	1	$ 3,960.00		$ 3,960.00
			$ -		$ -
SUBTOTAL					**$ 7,260.00**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 205,630.88**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	61	Coyote Springs		
Site Description --->			6 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	6	$ 243,240.00	26.00%	$ 179,997.60
84" Open Rack (Seismic)	$ 4,928.00	2	$ 9,856.00	26.00%	$ 7,293.44
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 223,014.54**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	61	Coyote Springs		
Site Description --->			6 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel			$ -		$ -
P25 Combiner - 6 channel	$ 6,900.00	1	$ 6,900.00	0.00%	$ 6,900.00
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75	0.00%	$ 1,898.75
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 4,765.00	1	$ 4,765.00	10.00%	$ 4,288.50
P25 Antennas	$ 2,961.25	2	$ 5,922.50	0.00%	$ 5,922.50
Conventional Combiner - 800MHz					
Conventional Combiner - VHF					
Conventional Multicoupler					
Conventional Antenna - 800 MHz					
Conventional Antenna - VHF					
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Combiner - 5 channel			$ -		$ -
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 20,881.00**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction	$ 128,633.93	1	$ 128,633.93	0.00%	$ 128,633.93
Shelter, with Foundation & Construction	$ 206,397.32	1	$ 206,397.32	0.00%	$ 206,397.32
Site Development - Roads, Fencing, Land Clearing	$ 54,780.00	1	$ 54,780.00	0.00%	$ 54,780.00
Generator, 40KW with Foundation and LP Tank	$ 41,025.00	1	$ 41,025.00	0.00%	$ 41,025.00
Electrical Work	$ 18,810.00	1	$ 18,810.00	0.00%	$ 18,810.00
DC Power	$ 60,252.50	1	$ 60,252.50	0.00%	$ 60,252.50
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 45,225.00	1	$ 45,225.00	0.00%	$ 45,225.00
Tower Structural Analysis			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 555,123.75**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 818,534.76**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	62	Mesquite		
Site Description --->			6 Channel Multisite / NCRN		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	6	$ 243,240.00	26.00%	$ 179,997.60
84" Open Rack (Seismic)	$ 4,928.00	4	$ 19,712.00	26.00%	$ 14,586.88
Site Interface Equipment - Conventional	$ 12,872.00	1	$ 12,872.00	26.00%	$ 9,525.28
TB9435 Conventional Repeater	$ 14,064.50	6	$ 84,387.00	26.00%	$ 62,446.38
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 302,279.64**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	62	Mesquite		
Site Description --->			6 Channel Multisite / NCRN		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel			$ -		$ -
P25 Combiner - 6 channel	$ 6,900.00	1	$ 6,900.00		$ 6,900.00
P25 Combiner - 8 channel	$ 10,046.25	0	$ -	0.00%	$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75	0.00%	$ 1,898.75
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 4,765.00	1	$ 4,765.00	10.00%	$ 4,288.50
P25 Antennas	$ 1,798.25	2	$ 3,596.50	0.00%	$ 3,596.50
Conventional Combiner - 800MHz	$ 7,950.00	0	$ -	10.00%	$ -
Conventional Combiner - VHF	$ 12,320.00	1	$ 12,320.00	10.00%	$ 11,088.00
Conventional Multicoupler	$ 5,500.00	0	$ -	10.00%	$ -
Conventional Antenna - 800 MHz	$ 2,431.25	0	$ -	10.00%	$ -
Conventional Antenna - VHF	$ 1,875.00	2	$ 3,750.00	0.00%	$ 3,750.00
Conventional Cables, Connectors, Filters	$ 10,045.00	1	$ 10,045.00	10.00%	$ 9,040.50
P25 Combiner - 5 channel			$ -		$ -
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 42,433.50**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction			$ -	0.00%	$ -
Shelter, with Foundation & Construction			$ -	0.00%	$ -
Site Development - Roads, Fencing, Land Clearing			$ -	0.00%	$ -
Generator, 40KW with Foundation and LP Tank			$ -	0.00%	$ -
Electrical Work	$ 1,980.00	1	$ 1,980.00	0.00%	$ 1,980.00
DC Power			$ -	0.00%	$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 1,320.00	1	$ 1,320.00	0.00%	$ 1,320.00
Tower Structural Analysis	$ 3,960.00	1	$ 3,960.00		$ 3,960.00
			$ -		$ -
SUBTOTAL					**$ 7,260.00**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 371,488.61**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	63	LV SC Westside		
Site Description --->			12 Channel Simulcast		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite			$ -		$ -
Network Sentry - Simulcast Site	$ 15,000.00	0	$ -	26.00%	$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 81,754.00	0	$ -	26.00%	$ -
MASTR V P25 Trunked Base Station	$ 40,540.00	0	$ -	26.00%	$ -
84" Open Rack (Seismic)	$ 4,928.00	0	$ -	26.00%	$ -
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	63	LV SC Westside		
Site Description --->			12 Channel Simulcast		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel			$ -		$ -
P25 Combiner - 6 channel	$ 8,287.50	0	$ -	0.00%	$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port			$ -		$ -
P25 Multicoupler - 16 Port	$ 2,322.50	0	$ -	0.00%	$ -
Tower Top Amplifier	$ 1,871.25	0	$ -	0.00%	$ -
P25 Cables, Connectors, Filters	$ 10,987.00	0	$ -	10.00%	$ -
P25 Antennas	$ 1,632.50	0	$ -	0.00%	$ -
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF			$ -		$ -
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF			$ -		$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Combiner - 5 channel			$ -		$ -
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ -**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port			$ -		$ -
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ -**
Site Infrastructure					
Tower, with Foundation & Construction			$ -		$ -
Shelter, with Foundation & Construction			$ -		$ -
Site Development - Roads, Fencing, Land Clearing			$ -		$ -
Generator, 40KW with Foundation and LP Tank			$ -		$ -
Electrical Work			$ -		$ -
DC Power			$ -		$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition			$ -		$ -
Tower Structural Analysis			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ -**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	64	LV SC Cheyenne		
Site Description --->			12 Channel Simulcast		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite			$ -		$ -
Network Sentry - Simulcast Site	$ 15,000.00	0	$ -	26.00%	$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 81,754.00	0	$ -	26.00%	$ -
MASTR V P25 Trunked Base Station	$ 40,540.00	0	$ -	26.00%	$ -
84" Open Rack (Seismic)	$ 4,928.00	0	$ -	26.00%	$ -
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	64	LV SC Cheyenne		
Site Description --->			12 Channel Simulcast		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel			$ -		$ -
P25 Combiner - 6 channel	$ 8,287.50	0	$ -	0.00%	$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port			$ -		$ -
P25 Multicoupler - 16 Port	$ 2,322.50	0	$ -	0.00%	$ -
Tower Top Amplifier	$ 1,871.25	0	$ -	0.00%	$ -
P25 Cables, Connectors, Filters	$ 10,784.50	0	$ -	10.00%	$ -
P25 Antennas	$ 1,632.50	0	$ -	0.00%	$ -
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF			$ -		$ -
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF			$ -		$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Combiner - 5 channel			$ -		$ -
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ -**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port			$ -		$ -
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ -**
Site Infrastructure					
Tower, with Foundation & Construction			$ -		$ -
Shelter, with Foundation & Construction			$ -		$ -
Site Development - Roads, Fencing, Land Clearing			$ -		$ -
Generator, 40KW with Foundation and LP Tank			$ -		$ -
Electrical Work			$ -		$ -
DC Power			$ -		$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition			$ -		$ -
Tower Structural Analysis			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ -**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	65	LV SC Washington		
Site Description --->			12 Channel Simulcast		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite			$ -		$ -
Network Sentry - Simulcast Site	$ 15,000.00	0	$ -	26.00%	$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 81,754.00	0	$ -	26.00%	$ -
MASTR V P25 Trunked Base Station	$ 40,540.00	0	$ -	26.00%	$ -
84" Open Rack (Seismic)	$ 4,928.00	0	$ -	26.00%	$ -
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	65	LV SC Washington		
Site Description --->			12 Channel Simulcast		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel			$ -		$ -
P25 Combiner - 6 channel	$ 8,287.50	0	$ -	0.00%	$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port			$ -		$ -
P25 Multicoupler - 16 Port	$ 2,322.50	0	$ -	0.00%	$ -
Tower Top Amplifier	$ 1,871.25	0	$ -	0.00%	$ -
P25 Cables, Connectors, Filters	$ 10,254.50	0	$ -	10.00%	$ -
P25 Antennas	$ 1,632.50	0	$ -	0.00%	$ -
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF			$ -		$ -
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF			$ -		$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Combiner - 5 channel			$ -		$ -
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ -**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port			$ -		$ -
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ -**
Site Infrastructure					
Tower, with Foundation & Construction			$ -		$ -
Shelter, with Foundation & Construction			$ -		$ -
Site Development - Roads, Fencing, Land Clearing			$ -		$ -
Generator, 40KW with Foundation and LP Tank			$ -		$ -
Electrical Work			$ -		$ -
DC Power			$ -		$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition			$ -		$ -
Tower Structural Analysis			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ -**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	66	Durango		
Site Description --->			12 Channel Simulcast		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite			$ -		$ -
Network Sentry - Simulcast Site	$ 15,000.00	0	$ -	26.00%	$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 81,754.00	0	$ -	26.00%	$ -
MASTR V P25 Trunked Base Station	$ 40,540.00	0	$ -	26.00%	$ -
84" Open Rack (Seismic)	$ 4,928.00	0	$ -	26.00%	$ -
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	66	Durango		
Site Description --->			12 Channel Simulcast		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel			$ -		$ -
P25 Combiner - 6 channel	$ 8,287.50	0	$ -	0.00%	$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port			$ -		$ -
P25 Multicoupler - 16 Port	$ 2,322.50	0	$ -	0.00%	$ -
Tower Top Amplifier	$ 1,871.25	0	$ -	0.00%	$ -
P25 Cables, Connectors, Filters	$ 10,987.00	0	$ -	10.00%	$ -
P25 Antennas	$ 1,632.50	0	$ -	0.00%	$ -
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF			$ -		$ -
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF			$ -		$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Combiner - 5 channel			$ -		$ -
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ -**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port			$ -		$ -
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ -**
Site Infrastructure					
Tower, with Foundation & Construction			$ -		$ -
Shelter, with Foundation & Construction			$ -		$ -
Site Development - Roads, Fencing, Land Clearing			$ -		$ -
Generator, 40KW with Foundation and LP Tank			$ -		$ -
Electrical Work			$ -		$ -
DC Power			$ -		$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition			$ -		$ -
Tower Structural Analysis			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ -**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	67	Thomas & Mack		
Site Description --->			12 Channel Simulcast		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite			$ -		$ -
Network Sentry - Simulcast Site	$ 15,000.00	0	$ -	26.00%	$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 81,754.00	0	$ -	26.00%	$ -
MASTR V P25 Trunked Base Station	$ 40,540.00	0	$ -	26.00%	$ -
84" Open Rack (Seismic)	$ 4,928.00	0	$ -	26.00%	$ -
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	67	Thomas & Mack		
Site Description --->			12 Channel Simulcast		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel			$ -		$ -
P25 Combiner - 6 channel	$ 8,287.50	0	$ -	0.00%	$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port			$ -		$ -
P25 Multicoupler - 16 Port	$ 2,322.50	0	$ -	0.00%	$ -
Tower Top Amplifier	$ 1,871.25	0	$ -	0.00%	$ -
P25 Cables, Connectors, Filters	$ 11,675.50	0	$ -	10.00%	$ -
P25 Antennas	$ 1,425.00	0	$ -	0.00%	$ -
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF			$ -		$ -
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF			$ -		$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Combiner - 5 channel			$ -		$ -
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ -**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port			$ -		$ -
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ -**
Site Infrastructure					
Tower, with Foundation & Construction			$ -		$ -
Shelter, with Foundation & Construction			$ -		$ -
Site Development - Roads, Fencing, Land Clearing			$ -		$ -
Generator, 40KW with Foundation and LP Tank			$ -		$ -
Electrical Work			$ -		$ -
DC Power			$ -		$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition			$ -		$ -
Tower Structural Analysis			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ -**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	68	Hoover Dam		
Site Description --->			4 Channel Multisite (Was 5)		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	4	$ 162,160.00	26.00%	$ 119,998.40
84" Open Rack (Seismic)	$ 4,928.00	2	$ 9,856.00	26.00%	$ 7,293.44
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 163,015.34**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	68	Hoover Dam		
Site Description --->			4 Channel Multisite (Was 5)		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel	$ 4,912.50	1	$ 4,912.50		$ 4,912.50
P25 Combiner - 6 channel	$ 8,287.50	0	$ -	0.00%	$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75	0.00%	$ 1,898.75
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 4,805.50	1	$ 4,805.50	10.00%	$ 4,324.95
P25 Antennas	$ 2,964.25	2	$ 5,928.50	0.00%	$ 5,928.50
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF			$ -		$ -
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF			$ -		$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Combiner - 5 channel			$ -		$ -
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 18,935.95**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction	$ 128,633.93	1	$ 128,633.93	0.00%	$ 128,633.93
Shelter, with Foundation & Construction	$ 206,397.32	1	$ 206,397.32	0.00%	$ 206,397.32
Site Development - Roads, Fencing, Land Clearing	$ 54,780.00	1	$ 54,780.00	0.00%	$ 54,780.00
Generator, 40KW with Foundation and LP Tank	$ 41,025.00	1	$ 41,025.00	0.00%	$ 41,025.00
Electrical Work	$ 18,810.00	1	$ 18,810.00	0.00%	$ 18,810.00
DC Power	$ 60,252.50	1	$ 60,252.50	0.00%	$ 60,252.50
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 45,225.00	1	$ 45,225.00	0.00%	$ 45,225.00
Tower Structural Analysis			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 555,123.75**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 756,590.51**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	69	Site on Wheels (Qty 3)		
Site Description --->			Transportable Site		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite			$ -		$ -
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site	$ 21,000.00	3	$ 63,000.00	26.00%	$ 46,620.00
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 46,620.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 16,110.00	2	$ 32,220.00	26.00%	$ 23,842.80
MASTR V P25 Trunked Base Station	$ 40,540.00	8	$ 324,320.00	26.00%	$ 239,996.80
84" Open Rack (Seismic)	$ 4,928.00	2	$ 9,856.00	26.00%	$ 7,293.44
Site Interface Equipment - Conventional	$ 16,110.00	1	$ 16,110.00	26.00%	$ 11,921.40
TB9435 Conventional Repeater	$ 14,064.50	4	$ 56,258.00	26.00%	$ 41,630.92
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 324,685.36**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	69	Site on Wheels (Qty 3)		
Site Description --->			Transportable Site		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel	$ 4,912.50	2	$ 9,825.00	0.00%	$ 9,825.00
P25 Combiner - 6 channel	$ 13,050.00	0	$ -	10.00%	$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	6	$ 11,392.50	0.00%	$ 11,392.50
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	0	$ -	0.00%	$ -
P25 Cables, Connectors, Filters	$ 6,777.00	3	$ 20,331.00	10.00%	$ 18,297.90
P25 Antennas	$ 3,930.00	3	$ 11,790.00	0.00%	$ 11,790.00
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF	$ 4,912.50	1	$ 4,912.50	0.00%	$ 4,912.50
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF			$ -		$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Combiner - 5 channel			$ -		$ -
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 56,217.90**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port			$ -		$ -
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ -**
Site Infrastructure					
Tower, with Foundation & Construction			$ -		$ -
Shelter, with Foundation & Construction			$ -		$ -
Site Development - Roads, Fencing, Land Clearing			$ -		$ -
Generator, 40KW with Foundation and LP Tank			$ -		$ -
Electrical Work			$ -		$ -
DC Power			$ -		$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition			$ -		$ -
Tower Structural Analysis			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 427,523.26**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	70	Peavine		
Site Description --->			7 Channel Simulcast		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite			$ -		$ -
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site	$ 15,000.00	0	$ -	26.00%	$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 81,754.00	0	$ -	26.00%	$ -
MASTR V P25 Trunked Base Station	$ 40,540.00	0	$ -	26.00%	$ -
84" Open Rack (Seismic)	$ 4,928.00	0	$ -	26.00%	$ -
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	70	Peavine		
Site Description --->			7 Channel Simulcast		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel			$ -		$ -
P25 Combiner - 6 channel			$ -		$ -
P25 Combiner - 8 channel	$ 10,046.25	0	$ -	0.00%	$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	0	$ -	0.00%	$ -
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	0	$ -	0.00%	$ -
P25 Cables, Connectors, Filters	$ 11,675.50	0	$ -	10.00%	$ -
P25 Antennas	$ 1,425.00	0	$ -	0.00%	$ -
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF	$ 12,320.00	0	$ -	10.00%	$ -
Conventional Multicoupler					$ -
Conventional Antenna - 800 MHz					$ -
Conventional Antenna - VHF	$ 595.00	0	$ -	10.00%	$ -
Conventional Cables, Connectors, Filters	$ 11,728.00	0	$ -	10.00%	$ -
P25 Combiner - 5 channel			$ -		$ -
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ -**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port			$ -		$ -
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ -**
Site Infrastructure					
Tower, with Foundation & Construction			$ -		$ -
Shelter, with Foundation & Construction			$ -		$ -
Site Development - Roads, Fencing, Land Clearing			$ -		$ -
Generator, 40KW with Foundation and LP Tank			$ -		$ -
Electrical Work			$ -		$ -
DC Power			$ -		$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition			$ -		$ -
Tower Structural Analysis			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ -**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	71	Red Peak		
Site Description --->			7 Channel Simulcast		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite			$ -		$ -
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site	$ 15,000.00	0	$ -	26.00%	$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 81,754.00	0	$ -	26.00%	$ -
MASTR V P25 Trunked Base Station	$ 40,540.00	0	$ -	26.00%	$ -
84" Open Rack (Seismic)	$ 4,928.00	0	$ -	26.00%	$ -
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	71	Red Peak		
Site Description --->			7 Channel Simulcast		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel			$ -		$ -
P25 Combiner - 6 channel			$ -		$ -
P25 Combiner - 8 channel	$ 10,046.25	0	$ -	0.00%	$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	0	$ -	0.00%	$ -
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	0	$ -	0.00%	$ -
P25 Cables, Connectors, Filters	$ 11,675.50	0	$ -	10.00%	$ -
P25 Antennas	$ 1,425.00	0	$ -	0.00%	$ -
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF			$ -		$ -
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF			$ -		$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Combiner - 5 channel			$ -		$ -
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ -**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port			$ -		$ -
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ -**
Site Infrastructure					
Tower, with Foundation & Construction			$ -		$ -
Shelter, with Foundation & Construction			$ -		$ -
Site Development - Roads, Fencing, Land Clearing			$ -		$ -
Generator, 40KW with Foundation and LP Tank			$ -		$ -
Electrical Work			$ -		$ -
DC Power			$ -		$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition			$ -		$ -
Tower Structural Analysis			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ -**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	72	Virginia Peak		
Site Description --->			6 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	0	$ -	26.00%	$ -
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 48,275.00	0	$ -	26.00%	$ -
MASTR V P25 Trunked Base Station	$ 40,540.00	0	$ -	26.00%	$ -
84" Open Rack (Seismic)	$ 4,928.00	0	$ -	26.00%	$ -
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	72	Virginia Peak		
Site Description --->			6 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel			$ -		$ -
P25 Combiner - 6 channel	$ 8,287.50	0	$ -	0.00%	$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	0	$ -	0.00%	$ -
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	0	$ -	0.00%	$ -
P25 Cables, Connectors, Filters	$ 7,076.25	0	$ -	10.00%	$ -
P25 Antennas	$ 2,961.25	0	$ -	0.00%	$ -
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF			$ -		$ -
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF			$ -		$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Combiner - 5 channel			$ -		$ -
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ -**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port			$ -		$ -
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ -**
Site Infrastructure					
Tower, with Foundation & Construction			$ -		$ -
Shelter, with Foundation & Construction			$ -		$ -
Site Development - Roads, Fencing, Land Clearing			$ -		$ -
Generator, 40KW with Foundation and LP Tank			$ -		$ -
Electrical Work			$ -		$ -
DC Power			$ -		$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition			$ -		$ -
Tower Structural Analysis			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ -**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI	
	GREENFIELD SITES
Site Description --->	TOTAL
Subsystem Category	Equipment Discounted
System Control Equipment, Software, and Licensing	
Primary NSC Premier Server with SW & Lics	$ -
Primary VIDA Connect Core with SW & Lics FAST	$ -
Secondary VIDA Connect Core with SW & Lics BW	$ -
Distributed Control Point Licenses	$ -
Asset Manager - CommSHOP 360	$ -
System Management Terminals	$ -
SUBTOTAL	**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing	
Network Sentry - Multisite	$ 186,480.00
Network Sentry - Simulcast Site	$ -
Network Sentry - Transportable Site	$ -
	$ -
	$ -
SUBTOTAL	**$ 186,480.00**
Radio System Equipment, Software and Licensing	
Site Interface Equipment - P25	$ 428,682.00
MASTR V P25 Trunked Base Station	$ 1,649,978.00
84" Open Rack (Seismic)	$ 87,521.28
Site Interface Equipment - Conventional	$ 33,987.46
TB9435 Conventional Repeater	$ 248,964.12
	$ -
	$ -
SUBTOTAL	**$ 2,449,132.86**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI		
	GREENFIELD SITES	
Site Description --->	TOTAL	
Subsystem Category	Equipment Discounted	
Antenna Systems		
P25 Combiner - 4 channel	$	44,212.50
P25 Combiner - 6 channel	$	20,700.00
P25 Combiner - 8 channel	$	-
P25 Combiner - 10 channel	$	-
P25 Multicoupler - 8 Port	$	22,785.00
P25 Multicoupler - 16 Port	$	-
Tower Top Amplifier	$	22,455.00
P25 Cables, Connectors, Filters	$	53,799.08
P25 Antennas	$	66,807.75
Conventional Combiner - 800MHz	$	-
Conventional Combiner - VHF	$	22,176.00
Conventional Multicoupler	$	-
Conventional Antenna - 800 MHz	$	-
Conventional Antenna - VHF	$	13,017.00
Conventional Cables, Connectors, Filters	$	33,212.52
P25 Combiner - 5 channel	$	5,906.25
P25 Combiner - 7 channel	$	-
SUBTOTAL	**$**	**305,071.10**
Networking Equipment, Software, and Licensing		
Interop Gateway w/36 talkpaths	$	-
Interop Gateway w/18 talkpaths	$	-
Cisco Switch DC 24-Port	$	47,705.58
EDACS Migration Gateway	$	-
ISSI Gateway	$	-
CSSI Gateway	$	-
SUBTOTAL	**$**	**47,705.58**
Site Infrastructure		
Tower, with Foundation & Construction	$	1,414,973.21
Shelter, with Foundation & Construction	$	2,270,370.54
Site Development - Roads, Fencing, Land Clearing	$	602,580.00
Generator, 40KW with Foundation and LP Tank	$	451,275.00
Electrical Work	$	208,890.00
DC Power	$	662,777.50
AC Unit	$	-
Permits, Drawings, Site Acquisition	$	498,795.00
Tower Structural Analysis	$	3,960.00
	$	-
SUBTOTAL	**$**	**6,113,621.25**
Microwave Equipment, Software, and Licensing		
	$	-
	$	-
SUBTOTAL	**$**	**-**
TOTAL EQUIPMENT PRICE	**$**	**9,102,010.79**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	1	Painted Rock		
Site Description --->			6 Channel Multisite (Was 4)		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	6	$ 243,240.00	26.00%	$ 179,997.60
84" Open Rack (Seismic)	$ 4,928.00	2	$ 9,856.00	26.00%	$ 7,293.44
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 223,014.54**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	1	Painted Rock		
Site Description --->			6 Channel Multisite (Was 4)		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel	$ 5,417.50	0	$ -	0.00%	$ -
P25 Combiner - 6 channel	$ 6,900.00	1	$ 6,900.00		$ 6,900.00
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75	0.00%	$ 1,898.75
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 4,765.00	1	$ 4,765.00	10.00%	$ 4,288.50
P25 Antennas	$ 2,961.25	2	$ 5,922.50	0.00%	$ 5,922.50
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF			$ -		$ -
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF			$ -		$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Combiner - 5 channel			$ -		$ -
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 20,881.00**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction	$ 128,633.93	1	$ 128,633.93	0.00%	$ 128,633.93
Shelter, with Foundation & Construction	$ 206,397.32	1	$ 206,397.32	0.00%	$ 206,397.32
Site Development - Roads, Fencing, Land Clearing	$ 54,780.00	1	$ 54,780.00	0.00%	$ 54,780.00
Generator, 40KW with Foundation and LP Tank	$ 41,025.00	1	$ 41,025.00	0.00%	$ 41,025.00
Electrical Work	$ 18,810.00	1	$ 18,810.00	0.00%	$ 18,810.00
DC Power	$ 60,252.50	1	$ 60,252.50	0.00%	$ 60,252.50
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 45,225.00	1	$ 45,225.00	0.00%	$ 45,225.00
Tower Structural Analysis			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 555,123.75**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 818,534.76**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	2	USA Highway (Parkway)		
Site Description --->			5 Channel Multisite (Was 4)		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	5	$ 202,700.00	26.00%	$ 149,998.00
84" Open Rack (Seismic)	$ 4,928.00	2	$ 9,856.00	26.00%	$ 7,293.44
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 193,014.94**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	2	USA Highway (Parkway)		
Site Description --->			5 Channel Multisite (Was 4)		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel	$ 5,417.50	0	$ -	0.00%	$ -
P25 Combiner - 6 channel			$ -		$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75	0.00%	$ 1,898.75
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 4,652.75	1	$ 4,652.75	10.00%	$ 4,187.48
P25 Antennas	$ 1,343.50	2	$ 2,687.00	0.00%	$ 2,687.00
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF			$ -		$ -
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF			$ -		$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Combiner - 5 channel	$ 5,906.25	1	$ 5,906.25	0.00%	$ 5,906.25
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 16,550.73**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction	$ 128,633.93	1	$ 128,633.93	0.00%	$ 128,633.93
Shelter, with Foundation & Construction	$ 206,397.32	1	$ 206,397.32	0.00%	$ 206,397.32
Site Development - Roads, Fencing, Land Clearing	$ 54,780.00	1	$ 54,780.00	0.00%	$ 54,780.00
Generator, 40KW with Foundation and LP Tank	$ 41,025.00	1	$ 41,025.00	0.00%	$ 41,025.00
Electrical Work	$ 18,810.00	1	$ 18,810.00	0.00%	$ 18,810.00
DC Power	$ 60,252.50	1	$ 60,252.50	0.00%	$ 60,252.50
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 45,225.00	1	$ 45,225.00	0.00%	$ 45,225.00
Tower Structural Analysis			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 555,123.75**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 784,204.88**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	3	Jackpot		
Site Description --->			4 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	4	$ 162,160.00	26.00%	$ 119,998.40
84" Open Rack (Seismic)	$ 4,928.00	2	$ 9,856.00	26.00%	$ 7,293.44
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 163,015.34**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	3	Jackpot		
Site Description --->			4 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel	$ 4,912.50	1	$ 4,912.50	0.00%	$ 4,912.50
P25 Combiner - 6 channel			$ -		$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75	0.00%	$ 1,898.75
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 4,275.50	1	$ 4,275.50	10.00%	$ 3,847.95
P25 Antennas	$ 2,961.25	2	$ 5,922.50	0.00%	$ 5,922.50
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF			$ -		$ -
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF			$ -		$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Combiner - 5 channel			$ -		$ -
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 18,452.95**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction	$ 128,633.93	1	$ 128,633.93	0.00%	$ 128,633.93
Shelter, with Foundation & Construction	$ 206,397.32	1	$ 206,397.32	0.00%	$ 206,397.32
Site Development - Roads, Fencing, Land Clearing	$ 54,780.00	1	$ 54,780.00	0.00%	$ 54,780.00
Generator, 40KW with Foundation and LP Tank	$ 41,025.00	1	$ 41,025.00	0.00%	$ 41,025.00
Electrical Work	$ 18,810.00	1	$ 18,810.00	0.00%	$ 18,810.00
DC Power	$ 60,252.50	1	$ 60,252.50	0.00%	$ 60,252.50
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 45,225.00	1	$ 45,225.00	0.00%	$ 45,225.00
Tower Structural Analysis			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 555,123.75**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 756,107.51**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	4	NDOT Yard		
Site Description --->			4 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	0	$ -	26.00%	$ -
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 48,275.00	0	$ -	26.00%	$ -
MASTR V P25 Trunked Base Station	$ 40,540.00	0	$ -	26.00%	$ -
84" Open Rack (Seismic)	$ 4,928.00	0	$ -	26.00%	$ -
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	4	NDOT Yard		
Site Description --->			4 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel	$ 5,417.50	0	$ -	0.00%	$ -
P25 Combiner - 6 channel			$ -		$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	0	$ -	0.00%	$ -
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	0	$ -	0.00%	$ -
P25 Cables, Connectors, Filters	$ 6,871.00	0	$ -	10.00%	$ -
P25 Antennas	$ 2,961.25	0	$ -	0.00%	$ -
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF			$ -		$ -
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF			$ -		$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Combiner - 5 channel			$ -		$ -
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ -**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port			$ -		$ -
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ -**
Site Infrastructure					
Tower, with Foundation & Construction	$ 121,356.25	0	$ -	0.00%	$ -
Shelter, with Foundation & Construction	$ 190,883.75	0	$ -	0.00%	$ -
Site Development - Roads, Fencing, Land Clearing	$ 70,187.50	0	$ -	0.00%	$ -
Generator, 40KW with Foundation and LP Tank	$ 57,240.00	0	$ -	0.00%	$ -
Electrical Work	$ 17,812.50	0	$ -	0.00%	$ -
DC Power	$ 61,848.75	0	$ -	0.00%	$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition			$ -		$ -
Tower Structural Analysis			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ -**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	5	Humboldt County		
Site Description --->			4 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	0	$ -	26.00%	$ -
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 48,275.00	0	$ -	26.00%	$ -
MASTR V P25 Trunked Base Station	$ 40,540.00	0	$ -	26.00%	$ -
84" Open Rack (Seismic)	$ 4,928.00	0	$ -	26.00%	$ -
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	5	Humboldt County		
Site Description --->			4 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel	$ 5,417.50	0	$ -	0.00%	$ -
P25 Combiner - 6 channel			$ -		$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	0	$ -	0.00%	$ -
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	0	$ -	0.00%	$ -
P25 Cables, Connectors, Filters	$ 6,226.00	0	$ -	10.00%	$ -
P25 Antennas	$ 2,961.25	0	$ -	0.00%	$ -
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF			$ -		$ -
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF			$ -		$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Combiner - 5 channel			$ -		$ -
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ -**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port			$ -		$ -
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ -**
Site Infrastructure					
Tower, with Foundation & Construction	$ 123,115.00	0	$ -	0.00%	$ -
Shelter, with Foundation & Construction	$ 190,883.75	0	$ -	0.00%	$ -
Site Development - Roads, Fencing, Land Clearing	$ 93,937.50	0	$ -	0.00%	$ -
Generator, 40KW with Foundation and LP Tank	$ 57,240.00	0	$ -	0.00%	$ -
Electrical Work	$ 17,812.50	0	$ -	0.00%	$ -
DC Power	$ 61,848.75	0	$ -	0.00%	$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition			$ -		$ -
Tower Structural Analysis			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ -**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	6	Double H		
Site Description --->			4 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	4	$ 162,160.00	26.00%	$ 119,998.40
84" Open Rack (Seismic)	$ 4,928.00	2	$ 9,856.00	26.00%	$ 7,293.44
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 163,015.34**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	6	Double H		
Site Description --->			4 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel	$ 4,912.50	1	$ 4,912.50	0.00%	$ 4,912.50
P25 Combiner - 6 channel			$ -		$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75	0.00%	$ 1,898.75
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 4,540.50	1	$ 4,540.50	10.00%	$ 4,086.45
P25 Antennas	$ 2,992.25	2	$ 5,984.50	0.00%	$ 5,984.50
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF			$ -		$ -
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF			$ -		$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Combiner - 5 channel			$ -		$ -
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 18,753.45**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction	$ 128,633.93	1	$ 128,633.93	0.00%	$ 128,633.93
Shelter, with Foundation & Construction	$ 206,397.32	1	$ 206,397.32	0.00%	$ 206,397.32
Site Development - Roads, Fencing, Land Clearing	$ 54,780.00	1	$ 54,780.00	0.00%	$ 54,780.00
Generator, 40KW with Foundation and LP Tank	$ 41,025.00	1	$ 41,025.00	0.00%	$ 41,025.00
Electrical Work	$ 18,810.00	1	$ 18,810.00	0.00%	$ 18,810.00
DC Power	$ 60,252.50	1	$ 60,252.50	0.00%	$ 60,252.50
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 45,225.00	1	$ 45,225.00	0.00%	$ 45,225.00
Tower Structural Analysis			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 555,123.75**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 756,408.01**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	7	Tahoe Mountain		
Site Description --->			4 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	4	$ 162,160.00	26.00%	$ 119,998.40
84" Open Rack (Seismic)	$ 4,928.00	2	$ 9,856.00	26.00%	$ 7,293.44
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 163,015.34**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	7	Tahoe Mountain		
Site Description --->			4 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel	$ 4,912.50	2	$ 9,825.00	0.00%	$ 9,825.00
P25 Combiner - 6 channel			$ -		$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75	0.00%	$ 1,898.75
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 4,540.50	1	$ 4,540.50	10.00%	$ 4,086.45
P25 Antennas	$ 2,698.25	3	$ 8,094.75	0.00%	$ 8,094.75
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF			$ -		$ -
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF			$ -		$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Combiner - 5 channel			$ -		$ -
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 25,776.20**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction	$ 128,633.93	1	$ 128,633.93	0.00%	$ 128,633.93
Shelter, with Foundation & Construction	$ 206,397.32	1	$ 206,397.32	0.00%	$ 206,397.32
Site Development - Roads, Fencing, Land Clearing	$ 54,780.00	1	$ 54,780.00	0.00%	$ 54,780.00
Generator, 40KW with Foundation and LP Tank	$ 41,025.00	1	$ 41,025.00	0.00%	$ 41,025.00
Electrical Work	$ 18,810.00	1	$ 18,810.00	0.00%	$ 18,810.00
DC Power	$ 60,252.50	1	$ 60,252.50	0.00%	$ 60,252.50
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 45,225.00	1	$ 45,225.00	0.00%	$ 45,225.00
Tower Structural Analysis			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 555,123.75**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 763,430.76**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	8	Hot Springs		
Site Description --->			6 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	6	$ 243,240.00	26.00%	$ 179,997.60
84" Open Rack (Seismic)	$ 4,928.00	2	$ 9,856.00	26.00%	$ 7,293.44
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 223,014.54**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	8	Hot Springs		
Site Description --->			6 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel			$ -		$ -
P25 Combiner - 6 channel	$ 6,900.00	1	$ 6,900.00	0.00%	$ 6,900.00
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75	0.00%	$ 1,898.75
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 6,355.00	1	$ 6,355.00	10.00%	$ 5,719.50
P25 Antennas	$ 2,992.25	2	$ 5,984.50	0.00%	$ 5,984.50
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF			$ -		$ -
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF			$ -		$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Combiner - 5 channel			$ -		$ -
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 22,374.00**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction	$ 128,633.93	1	$ 128,633.93	0.00%	$ 128,633.93
Shelter, with Foundation & Construction	$ 206,397.32	1	$ 206,397.32	0.00%	$ 206,397.32
Site Development - Roads, Fencing, Land Clearing	$ 54,780.00	1	$ 54,780.00	0.00%	$ 54,780.00
Generator, 40KW with Foundation and LP Tank	$ 41,025.00	1	$ 41,025.00	0.00%	$ 41,025.00
Electrical Work	$ 18,810.00	1	$ 18,810.00	0.00%	$ 18,810.00
DC Power	$ 60,252.50	1	$ 60,252.50	0.00%	$ 60,252.50
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 45,225.00	1	$ 45,225.00	0.00%	$ 45,225.00
Tower Structural Analysis			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 555,123.75**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 820,027.76**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	9	Deer Creek		
Site Description --->			4 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	4	$ 162,160.00	26.00%	$ 119,998.40
84" Open Rack (Seismic)	$ 4,928.00	2	$ 9,856.00	26.00%	$ 7,293.44
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 163,015.34**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	9	Deer Creek		
Site Description --->			4 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel	$ 4,912.50	1	$ 4,912.50	0.00%	$ 4,912.50
P25 Combiner - 6 channel			$ -	0.00%	$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75	0.00%	$ 1,898.75
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 4,540.50	1	$ 4,540.50	10.00%	$ 4,086.45
P25 Antennas	$ 2,992.25	2	$ 5,984.50	0.00%	$ 5,984.50
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF			$ -		$ -
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF			$ -		$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Combiner - 5 channel			$ -		$ -
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 18,753.45**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction	$ 128,633.93	1	$ 128,633.93	0.00%	$ 128,633.93
Shelter, with Foundation & Construction	$ 206,397.32	1	$ 206,397.32	0.00%	$ 206,397.32
Site Development - Roads, Fencing, Land Clearing	$ 54,780.00	1	$ 54,780.00	0.00%	$ 54,780.00
Generator, 40KW with Foundation and LP Tank	$ 41,025.00	1	$ 41,025.00	0.00%	$ 41,025.00
Electrical Work	$ 18,810.00	1	$ 18,810.00	0.00%	$ 18,810.00
DC Power	$ 60,252.50	1	$ 60,252.50	0.00%	$ 60,252.50
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 45,225.00	1	$ 45,225.00	0.00%	$ 45,225.00
Tower Structural Analysis			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 555,123.75**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 756,408.01**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	10	Tempiute		
Site Description --->			4 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	4	$ 162,160.00	26.00%	$ 119,998.40
84" Open Rack (Seismic)	$ 4,928.00	2	$ 9,856.00	26.00%	$ 7,293.44
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 163,015.34**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	10	Tempiute		
Site Description --->			4 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel	$ 4,912.50	1	$ 4,912.50	0.00%	$ 4,912.50
P25 Combiner - 6 channel			$ -		$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75	0.00%	$ 1,898.75
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 6,130.50	1	$ 6,130.50	10.00%	$ 5,517.45
P25 Antennas	$ 3,106.25	2	$ 6,212.50	0.00%	$ 6,212.50
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF			$ -		$ -
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF			$ -		$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Combiner - 5 channel			$ -		$ -
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 20,412.45**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction	$ 128,633.93	1	$ 128,633.93	0.00%	$ 128,633.93
Shelter, with Foundation & Construction	$ 206,397.32	1	$ 206,397.32	0.00%	$ 206,397.32
Site Development - Roads, Fencing, Land Clearing	$ 54,780.00	1	$ 54,780.00	0.00%	$ 54,780.00
Generator, 40KW with Foundation and LP Tank	$ 41,025.00	1	$ 41,025.00	0.00%	$ 41,025.00
Electrical Work	$ 18,810.00	1	$ 18,810.00	0.00%	$ 18,810.00
DC Power	$ 60,252.50	1	$ 60,252.50	0.00%	$ 60,252.50
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 45,225.00	1	$ 45,225.00	0.00%	$ 45,225.00
Tower Structural Analysis			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 555,123.75**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 758,067.01**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	11	White River		
Site Description --->			4 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	4	$ 162,160.00	26.00%	$ 119,998.40
84" Open Rack (Seismic)	$ 4,928.00	2	$ 9,856.00	26.00%	$ 7,293.44
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 163,015.34**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	11	White River		
Site Description --->			4 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel	$ 4,912.50	1	$ 4,912.50	0.00%	$ 4,912.50
P25 Combiner - 6 channel			$ -		$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75	0.00%	$ 1,898.75
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 6,130.50	1	$ 6,130.50	10.00%	$ 5,517.45
P25 Antennas	$ 2,992.25	2	$ 5,984.50	0.00%	$ 5,984.50
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF			$ -		$ -
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF			$ -		$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Combiner - 5 channel			$ -		$ -
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 20,184.45**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction	$ 128,633.93	1	$ 128,633.93	0.00%	$ 128,633.93
Shelter, with Foundation & Construction	$ 206,397.32	1	$ 206,397.32	0.00%	$ 206,397.32
Site Development - Roads, Fencing, Land Clearing	$ 54,780.00	1	$ 54,780.00	0.00%	$ 54,780.00
Generator, 40KW with Foundation and LP Tank	$ 41,025.00	1	$ 41,025.00	0.00%	$ 41,025.00
Electrical Work	$ 18,810.00	1	$ 18,810.00	0.00%	$ 18,810.00
DC Power	$ 60,252.50	1	$ 60,252.50	0.00%	$ 60,252.50
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 45,225.00	1	$ 45,225.00	0.00%	$ 45,225.00
Tower Structural Analysis			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 555,123.75**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 757,839.01**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	12	Mountain Springs		
Site Description --->			4 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	4	$ 162,160.00	26.00%	$ 119,998.40
84" Open Rack (Seismic)	$ 4,928.00	2	$ 9,856.00	26.00%	$ 7,293.44
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 163,015.34**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	12	Mountain Springs		
Site Description --->			4 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel	$ 4,912.50	1	$ 4,912.50	0.00%	$ 4,912.50
P25 Combiner - 6 channel			$ -		$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75	0.00%	$ 1,898.75
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 4,805.50	1	$ 4,805.50	10.00%	$ 4,324.95
P25 Antennas	$ 1,231.25	2	$ 2,462.50	0.00%	$ 2,462.50
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF			$ -		$ -
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF			$ -		$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Combiner - 5 channel			$ -		$ -
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 15,469.95**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction	$ 128,633.93	1	$ 128,633.93	0.00%	$ 128,633.93
Shelter, with Foundation & Construction	$ 206,397.32	1	$ 206,397.32	0.00%	$ 206,397.32
Site Development - Roads, Fencing, Land Clearing	$ 54,780.00	1	$ 54,780.00	0.00%	$ 54,780.00
Generator, 40KW with Foundation and LP Tank	$ 41,025.00	1	$ 41,025.00	0.00%	$ 41,025.00
Electrical Work	$ 18,810.00	1	$ 18,810.00	0.00%	$ 18,810.00
DC Power	$ 60,252.50	1	$ 60,252.50	0.00%	$ 60,252.50
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 45,225.00	1	$ 45,225.00	0.00%	$ 45,225.00
Tower Structural Analysis			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 555,123.75**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 753,124.51**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	13	Overton		
Site Description --->			Conventional Only / NCRN		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite			$ -		$ -
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25			$ -		$ -
MASTR V P25 Trunked Base Station			$ -		$ -
84" Open Rack (Seismic)			$ -		$ -
Site Interface Equipment - Conventional	$ 12,872.00	1	$ 12,872.00	26.00%	$ 9,525.28
TB9435 Conventional Repeater	$ 14,064.50	6	$ 84,387.00	26.00%	$ 62,446.38
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 71,971.66**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	13	Overton		
Site Description --->			Conventional Only / NCRN		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel			$ -		$ -
P25 Combiner - 6 channel			$ -		$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port			$ -		$ -
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier			$ -		$ -
P25 Cables, Connectors, Filters			$ -		$ -
P25 Antennas			$ -		$ -
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF	$ 12,320.00	1	$ 12,320.00	10.00%	$ 11,088.00
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF	$ 1,875.00	2	$ 3,750.00	0.00%	$ 3,750.00
Conventional Cables, Connectors, Filters	$ 10,045.00	1	$ 10,045.00	10.00%	$ 9,040.50
P25 Combiner - 5 channel			$ -		$ -
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 23,878.50**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port			$ -		$ -
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ -**
Site Infrastructure					
Tower, with Foundation & Construction			$ -		$ -
Shelter, with Foundation & Construction			$ -		$ -
Site Development - Roads, Fencing, Land Clearing			$ -		$ -
Generator, 40KW with Foundation and LP Tank			$ -		$ -
Electrical Work			$ -		$ -
DC Power			$ -		$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition			$ -		$ -
Tower Structural Analysis			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 95,850.16**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	14	Muller		
Site Description --->			6 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	6	$ 243,240.00	26.00%	$ 179,997.60
84" Open Rack (Seismic)	$ 4,928.00	2	$ 9,856.00	26.00%	$ 7,293.44
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 223,014.54**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	14	Muller		
Site Description --->			6 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel			$ -		$ -
P25 Combiner - 6 channel	$ 6,900.00	1	$ 6,900.00	0.00%	$ 6,900.00
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75	0.00%	$ 1,898.75
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 4,765.00	1	$ 4,765.00	10.00%	$ 4,288.50
P25 Antennas	$ 2,892.00	2	$ 5,784.00	0.00%	$ 5,784.00
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF			$ -		$ -
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF			$ -		$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Combiner - 5 channel			$ -		$ -
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 20,742.50**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction			$ -	0.00%	$ -
Shelter, with Foundation & Construction			$ -	0.00%	$ -
Site Development - Roads, Fencing, Land Clearing			$ -	0.00%	$ -
Generator, 40KW with Foundation and LP Tank			$ -	0.00%	$ -
Electrical Work	$ 1,980.00	1	$ 1,980.00	0.00%	$ 1,980.00
DC Power			$ -	0.00%	$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 1,320.00	1	$ 1,320.00	0.00%	$ 1,320.00
Tower Structural Analysis	$ 3,960.00	1	$ 3,960.00		$ 3,960.00
			$ -		$ -
SUBTOTAL					**$ 7,260.00**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 270,532.51**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	15	Indian Springs		
Site Description --->			4 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite	$ 21,000.00	1	$ 21,000.00	26.00%	$ 15,540.00
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 15,540.00**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25	$ 48,275.00	1	$ 48,275.00	26.00%	$ 35,723.50
MASTR V P25 Trunked Base Station	$ 40,540.00	4	$ 162,160.00	26.00%	$ 119,998.40
84" Open Rack (Seismic)	$ 4,928.00	2	$ 9,856.00	26.00%	$ 7,293.44
Site Interface Equipment - Conventional			$ -		$ -
TB9435 Conventional Repeater			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 163,015.34**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	15	Indian Springs		
Site Description --->			4 Channel Multisite		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel	$ 4,912.50	1	$ 4,912.50	0.00%	$ 4,912.50
P25 Combiner - 6 channel			$ -		$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port	$ 1,898.75	1	$ 1,898.75	0.00%	$ 1,898.75
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier	$ 1,871.25	1	$ 1,871.25	0.00%	$ 1,871.25
P25 Cables, Connectors, Filters	$ 4,275.50	1	$ 4,275.50	10.00%	$ 3,847.95
P25 Antennas	$ 2,892.00	2	$ 5,784.00	0.00%	$ 5,784.00
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF			$ -		$ -
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF			$ -		$ -
Conventional Cables, Connectors, Filters			$ -		$ -
P25 Combiner - 5 channel			$ -		$ -
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 18,314.45**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port	$ 5,372.25	1	$ 5,372.25	26.00%	$ 3,975.47
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ 3,975.47**
Site Infrastructure					
Tower, with Foundation & Construction	$ 128,633.93	1	$ 128,633.93	0.00%	$ 128,633.93
Shelter, with Foundation & Construction	$ 206,397.32	1	$ 206,397.32	0.00%	$ 206,397.32
Site Development - Roads, Fencing, Land Clearing	$ 54,780.00	1	$ 54,780.00	0.00%	$ 54,780.00
Generator, 40KW with Foundation and LP Tank	$ 41,025.00	1	$ 41,025.00	0.00%	$ 41,025.00
Electrical Work	$ 18,810.00	1	$ 18,810.00	0.00%	$ 18,810.00
DC Power	$ 60,252.50	1	$ 60,252.50	0.00%	$ 60,252.50
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition	$ 45,225.00	1	$ 45,225.00	0.00%	$ 45,225.00
Tower Structural Analysis			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 555,123.75**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 755,969.01**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	16	Pine Nut Mountain		
Site Description --->			NVE Site (NCRN Equip Only)		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite			$ -		$ -
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25			$ -		$ -
MASTR V P25 Trunked Base Station			$ -		$ -
84" Open Rack (Seismic)			$ -		$ -
Site Interface Equipment - Conventional	$ 7,313.00	1	$ 7,313.00	26.00%	$ 5,411.62
TB9435 Conventional Repeater	$ 13,879.50	6	$ 83,277.00	26.00%	$ 61,624.98
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 67,036.60**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	16	Pine Nut Mountain		
Site Description --->			NVE Site (NCRN Equip Only)		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel			$ -		$ -
P25 Combiner - 6 channel			$ -		$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port			$ -		$ -
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier			$ -		$ -
P25 Cables, Connectors, Filters			$ -		$ -
P25 Antennas			$ -		$ -
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF	$ 12,320.00	1	$ 12,320.00	10.00%	$ 11,088.00
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF	$ 595.00	4	$ 2,380.00	10.00%	$ 2,142.00
Conventional Cables, Connectors, Filters	$ 6,767.80	1	$ 6,767.80	10.00%	$ 6,091.02
P25 Combiner - 5 channel			$ -		$ -
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 19,321.02**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port			$ -		$ -
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ -**
Site Infrastructure					
Tower, with Foundation & Construction			$ -		$ -
Shelter, with Foundation & Construction			$ -		$ -
Site Development - Roads, Fencing, Land Clearing			$ -		$ -
Generator, 40KW with Foundation and LP Tank			$ -		$ -
Electrical Work			$ -		$ -
DC Power			$ -		$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition			$ -		$ -
Tower Structural Analysis			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 86,357.62**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	17	TV Hill		
Site Description --->			NVE Site (NCRN Equip Only)		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite			$ -		$ -
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25			$ -		$ -
MASTR V P25 Trunked Base Station			$ -		$ -
84" Open Rack (Seismic)			$ -		$ -
Site Interface Equipment - Conventional	$ 12,872.00	1	$ 12,872.00	26.00%	$ 9,525.28
TB9435 Conventional Repeater	$ 14,064.50	6	$ 84,387.00	26.00%	$ 62,446.38
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 71,971.66**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	17	TV Hill		
Site Description --->			NVE Site (NCRN Equip Only)		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel			$ -		$ -
P25 Combiner - 6 channel			$ -		$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port			$ -		$ -
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier			$ -		$ -
P25 Cables, Connectors, Filters			$ -		$ -
P25 Antennas			$ -		$ -
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF			$ -		$ -
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF	$ 1,875.00	2	$ 3,750.00	0.00%	$ 3,750.00
Conventional Cables, Connectors, Filters	$ 10,045.00	1	$ 10,045.00	10.00%	$ 9,040.50
P25 Combiner - 5 channel			$ -		$ -
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 12,790.50**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port			$ -		$ -
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ -**
Site Infrastructure					
Tower, with Foundation & Construction			$ -		$ -
Shelter, with Foundation & Construction			$ -		$ -
Site Development - Roads, Fencing, Land Clearing			$ -		$ -
Generator, 40KW with Foundation and LP Tank			$ -		$ -
Electrical Work			$ -		$ -
DC Power			$ -		$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition			$ -		$ -
Tower Structural Analysis			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 84,762.16**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	18	Argenta		
Site Description --->			NVE Site (NCRN Equip Only)		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
System Control Equipment, Software, and Licensing					
Primary NSC Premier Server with SW & Lics			$ -		$ -
Primary VIDA Connect Core with SW & Lics FAST			$ -		$ -
Secondary VIDA Connect Core with SW & Lics BW			$ -		$ -
Distributed Control Point Licenses			$ -		$ -
Asset Manager - CommSHOP 360			$ -		$ -
System Management Terminals			$ -		$ -
SUBTOTAL					**$ -**
Network Monitoring and Fault Management Equipment, Software, and Licensing					
Network Sentry - Multisite			$ -		$ -
Network Sentry - Simulcast Site			$ -		$ -
Network Sentry - Transportable Site			$ -		$ -
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
Radio System Equipment, Software and Licensing					
Site Interface Equipment - P25			$ -		$ -
MASTR V P25 Trunked Base Station			$ -		$ -
84" Open Rack (Seismic)			$ -		$ -
Site Interface Equipment - Conventional	$ 12,872.00	1	$ 12,872.00	26.00%	$ 9,525.28
TB9435 Conventional Repeater	$ 14,064.50	6	$ 84,387.00	26.00%	$ 62,446.38
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ 71,971.66**

TABLE B.2 - NDOT SYSTEM INFRASTRUCTURE PRI					
	Site --->	18	Argenta		
Site Description --->			NVE Site (NCRN Equip Only)		
Subsystem Category	**Unit Price**	**Qty**	**Extended Price**	**Discount %**	**Discounted Price**
Antenna Systems					
P25 Combiner - 4 channel			$ -		$ -
P25 Combiner - 6 channel			$ -		$ -
P25 Combiner - 8 channel			$ -		$ -
P25 Combiner - 10 channel			$ -		$ -
P25 Multicoupler - 8 Port			$ -		$ -
P25 Multicoupler - 16 Port			$ -		$ -
Tower Top Amplifier			$ -		$ -
P25 Cables, Connectors, Filters			$ -		$ -
P25 Antennas			$ -		$ -
Conventional Combiner - 800MHz			$ -		$ -
Conventional Combiner - VHF			$ -		$ -
Conventional Multicoupler			$ -		$ -
Conventional Antenna - 800 MHz			$ -		$ -
Conventional Antenna - VHF	$ 1,875.00	2	$ 3,750.00	10.00%	$ 3,375.00
Conventional Cables, Connectors, Filters	$ 10,045.00	1	$ 10,045.00	10.00%	$ 9,040.50
P25 Combiner - 5 channel			$ -		$ -
P25 Combiner - 7 channel			$ -		$ -
SUBTOTAL					**$ 12,415.50**
Networking Equipment, Software, and Licensing					
Interop Gateway w/36 talkpaths			$ -		$ -
Interop Gateway w/18 talkpaths			$ -		$ -
Cisco Switch DC 24-Port			$ -		$ -
EDACS Migration Gateway			$ -		$ -
ISSI Gateway			$ -		$ -
CSSI Gateway			$ -		$ -
SUBTOTAL					**$ -**
Site Infrastructure					
Tower, with Foundation & Construction			$ -		$ -
Shelter, with Foundation & Construction			$ -		$ -
Site Development - Roads, Fencing, Land Clearing			$ -		$ -
Generator, 40KW with Foundation and LP Tank			$ -		$ -
Electrical Work			$ -		$ -
DC Power			$ -		$ -
AC Unit			$ -		$ -
Permits, Drawings, Site Acquisition			$ -		$ -
Tower Structural Analysis			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
Microwave Equipment, Software, and Licensing					
			$ -		$ -
			$ -		$ -
SUBTOTAL					**$ -**
TOTAL EQUIPMENT PRICE					**$ 84,387.16**

TABLE B.3 - NDOT RECOMMENDED SPARE EQUIPMENT

Itemize the recommended spare equipment, test equipment, and spare parts to be purchased by the Member with the Base Proposal system (initial outfitting). Add additional rows as necessary.

EXAMPLES OF ITEMS ARE: complete base radios, System and GPS antennas, field replaceable units, circuit boards, power supplies, routers, switches, parts, test equipment, calibration equipment, diagnostic equipment, and repair kits.

Part Number	Item	Unit Price	Qty	Extended Price	Discount %	Discounted Price
Several	RF Equipment for 5 ch site - Site Interface equipment, Routers, Switches, Power Supplys, Racks, and MASTR V Stations	$ 270,031.60	5	$ 1,350,158.00	26%	$ 999,116.92
TB9435K4M00000 G0BA	RPTR P25 762-870M 100W DC48/12	$ 21,429.00	6	$ 128,574.00	26%	$ 95,144.76
TB9435B3M00000 G0BA	RPTR P25 148-174M 100W DC48/12	$ 21,429.00	6	$ 128,574.00	26%	$ 95,144.76
DS7C10F36U-D	700/800 MHz 10dB GAIN TX ANTENNA	$ 2,110.00	3	$ 6,330.00	0%	$ 6,330.00
DS7A08F36U-D	700/800 MHz 8 dB GAIN TX ANTENNA	$ 1,487.50	2	$ 2,975.00	0%	$ 2,975.00
SC412-HF2LDF	SINCLAIR 700/800 MHz 11.5 RX ANTENNA	$ 3,674.69	5	$ 18,373.45	0%	$ 18,373.45
DSCC85-05DS	5 CHANNEL COMBINER	$ 5,906.25	5	$ 29,531.25	0%	$ 29,531.25
CP00921-8	COMBILENT 700/800 MHz 8 PORT RECEIVER MULTICOUPLER	$ 1,898.75	11	$ 20,886.25	0%	$ 20,886.25
	Power Supply/Power Amps					
MASV-NPS9T	Power Supply,120VAC,60Hz,12/24VDC	$ 935.00	5	$ 4,675.00	26%	$ 3,459.50
SV-AW5R-A	POWER AMPLIFIER,LINEAR,800 MHZ	8,000.00	5	$ 40,000.00	26%	$ 29,600.00
MASV-NRF5D	Preselector,150-160MHz,MASTR V	$ 647.00	6	$ 3,882.00	26%	$ 2,872.68
MANG-NPS2K	Power Supply,DC,4-Slot Gateway Chassis	$ 2,050.00	1	$ 2,050.00	26%	$ 1,517.00
	Servers/Gateways					
MANG-NAA3E	Module,DVU,UAC,Interoperability Gateway	$ 11,500.00	3	$ 34,500.00	26%	$ 25,530.00
NS-PNSJ	SERVER, VIDA PREMIER, SR10A.4	$ 54,950.00	1	$ 54,950.00	26%	$ 40,663.00
NS-PNSK	SERVER, VIDA CONNECT, SR10A.4	$ 20,497.00	1	$ 20,497.00	26%	$ 15,167.78
	Routers					
VS-CR1G	ROUTER,ISR4221-SEC/K9	$ 2,959.00	7	$ 20,713.00	26%	$ 15,327.62
VSCU3H	SWITCH,CISCO 2960 PLUS	$ 1,524.50	7	$ 10,671.50	26%	$ 7,896.91
VS-CU7K	NIM,1PT GE WAN DLMODE RJ45 SFP	$ 1,009.75	6	$ 6,058.50	26%	$ 4,483.29
VS-CU5H	CISCO MODULE,SX MULTIMODE,FIBR	$ 429.63	12	$ 5,155.56	26%	$ 3,815.11
VS-CU7Z	MODULE,NIM 4PORT LAYER2 GE	$ 567.00	2	$ 1,134.00	26%	$ 839.16
	TOTAL TEST EQUIPMENT AND SPARES COST>>>>			**$ 1,889,688.51**		**$ 1,418,674.44**

TABLE B.4.A - NDOT BASE PROPOSAL SERVICES PRICES

Description	Services Prices
System Equipment Services	
Staging Acceptance Testing	$ -
Delivery/Shipping	included
Installation (including all equipment, antenna systems, old equipment removal, etc.) **3rd Party Subcontractor**	$ 3,077,823.75
Other - specify	
System Equipment Services Subtotal	**$ 3,077,823.75**
System Engineering	
System/Network Engineering (including coverage analysis and testing, documentation, system acceptance testing, etc.)	$ 2,785,472.00
Interference Analyses	incl above
FCC License Preparation	$ 133,560.00
Frequency Coordination	$ 96,136.00
Structural Analyses	
Other - Staging Acceptance Testing	$ 206,787.20
System Engineering Subtotal	**$ 3,221,955.20**
Site Development	
Site Development (Site Mgrs and Site Surveys) - **3rd Party Subcontractor**	$ 350,504.50
Other - Warehouse Rental and Personnel, Inventory Mgr, Admin Asst - **3rd Party Subcontractors**	$ 650,898.00
Site Development Subtotal	**$ 1,001,402.50**
Migration Services	
Migration Services (Included in System Engineering and Project Management)	Included
Other - specify	
Migration Services Subtotal	**$ -**
Project Management	
Project Management	$ 993,825.00
Other - specify	
Project Management Subtotal	**$ 993,825.00**
System Training	
Training,Customized	$ 17,100.00
Training,Web-Based	$ 24,000.00
Training,P25 Structuring Wrkshp	$ 24,282.00
Training,Unified Admin System	$ 17,057.25
Training-Regional Network Manager	$ 17,057.25
Training,Over The Air Rekeying	$ 9,747.00
Training,Radio Programming	$ 9,747.00
TRAINING,ISSI CONFIGURATION & ADMIN	$ 9,747.00
Training,P25 Sys Maintenance	$ 54,036.00
Training-Regional Network Manager	$ 17,057.25
Training-Network Operation and Maint.	$ 24,282.00
Training,MASTR V Maintenance	$ 17,057.25
Training,P25 Simulcast System Maint	$ 24,282.00
Training,RF Maintenance	$ 38,791.35
Training,Console Configuration Support	$ 39,900.00
Training,Web-Based	$ 3,375.00
Training,User Equipment Operation	$ 11,400.00
Training,Web-Based	$ 105,637.50
System Training Subtotal	**$ 464,555.85**
Performance Bond	included
TOTAL SERVICES	**$ 8,759,562.30**

TABLE B.4.B - NDOT GREENFIELD SITES SERVICES PRICES

Description	Services Prices
System Equipment Services	
Staging Acceptance Testing	
Delivery/Shipping	Included
Installation (including all equipment, antenna systems, old equipment removal, etc.) **3rd Party Subcontractor**	$ 1,025,941.25
Other - specify	
System Equipment Services Subtotal	**$ 1,025,941.25**
System Engineering	
System/Network Engineering (including coverage analysis and testing, documentation, system acceptance testing, etc.)	$ 696,368.00
Interference Analyses	
FCC License Preparation	$ 33,390.00
Frequency Coordination	$ 29,114.00
Structural Analyses	
Other - Staging Acceptance Testing	$ 44,696.80
System Engineering Subtotal	**$ 803,568.80**
Site Development	
Site Development (Site Mgrs and Site Surveys) - **3rd Party Subcontractor**	$ 1,051,513.50
Other - Warehouse Rental and Personnel, Inventory Mgr, Admin Asst - **3rd Party Subcontractors**	$ 216,966.00
Site Development Subtotal	**$ 1,268,479.50**
Migration Services	
Migration Services (Included in System Engineering and Project Management)	Included
Other - specify	
Migration Services Subtotal	**$ -**
Project Management	
Project Management	$ 331,275.00
Other - specify	
Project Management Subtotal	**$ 331,275.00**
TOTAL SERVICES	**$ 3,429,264.55**

TABLE B.11 - TOTAL GREENFIELD PRICE SUMMARY

TABLE B.11 provides a summary of the Greenfield Sites Price broken down by NDOT (Table B.11.A), NV Energy (Table B.11.B) and Washoe County (Table B.11.C) equipment and services.

TABLE B.11.A - NDOT TOTAL PRICE SUMMARY

System Equipment	Discounted Price
System Control Equipment, Software, and Licensing	$ -
Network Monitoring and Fault Management Equipment, Software, and Licensing	$ 186,480.00
Radio System Equipment, Software, and Licensing	$ 2,449,132.86
Antenna Systems	$ 305,071.10
Networking Equipment, Software, and Licensing	$ 47,705.58
Site Infrastructure - **NTE ESTIMATE (Civils)**	$ 6,113,621.25
Microwave Equipment, Software, and Licensing	$ -
TOTAL EQUIPMENT PRICE	**$ 9,102,010.79**
Deployment Services	
System Equipment Services	$ 1,025,941.25
System Engineering Services	$ 803,568.80
Site Development Services	$ 1,268,479.50
Migration Services	$ -
Project Management	$ 331,275.00
TOTAL SERVICES PRICE	**$ 3,429,264.55**
NDOT PROPOSAL PRICE	**$ 12,531,275.34**
Discount	
NDOT DISCOUNTED PROPOSAL PRICE	**$ 12,531,275.34**

TABLE B.12 - SYSTEM LIFECYCLE SUPPORT

These items and services will be considered for purchase in the future (but not delivered as part of initial system replacement project).

The Members plan on purchasing items and services at a fixed discount rate off of the List Price published at the time of purchase.

Table B.12.A - FUTURE EQUIPMENT AND COMPONENTS

EXAMPLES OF EQUIPMENT AND COMPONENT ITEMS ARE: complete base radios, antenna systems (antenna, transmission line, etc.), field replaceable units, circuit boards, power supplies, routers, switches, parts, test equipment, calibration equipment, diagnostic equipment, repair kits, software, software licensing, etc.

Description	List Price	Fixed Discount % Off of List Price	Discounted Price
RF Infrastructure Equipment and Parts	Per Catalog	26.00%	$ -
Base Stations, Site Interface Equipment, Routers, Switches			$ -
			$ -
User Radios and Parts	Per Catalog	35.00%	$ -
Radios, Accessories, Features			$ -
			$ -
Antenna Systems and Parts	Per Catalog	10.00%	$ -
			$ -
Software and Licenses	Per Catalog	26.00%	$ -

Table B.12.B - FUTURE SERVICES

EXAMPLES OF FUTURE SERVICES ARE: engineering services, field support services, project management, etc. Specify any daily or hourly rates and applicable discounts.

Description	List Price (Hourly Rate-Fully Burdened)	Fixed Discount % Off of List Price	Discounted Price
SERVICE, RF INTEGRITY Hourly rate for Engineering services to predict RF coverage from designated transmission site.	$ 151.25	0.00%	$ 151.25
			$ -
SERVICE, HARRIS SYSTEM ENGINEERING Hourly rate for System Engineering Services.	$ 198.75	0.00%	$ 198.75
			$ -
SERVICE, HARRIS SENIOR SYSTEM ENGINEERING Hourly rate for Senior System Engineering Services	$ 300.00	0.00%	$ 300.00
			$ -
SERVICE, HARRIS PROJECT MANAGEMENT Hourly rate for Project Management to assist implementing customer projects.	$ 198.75	0.00%	$ 198.75
			$ -
SERVICE, HARRIS SENIOR PROJECT MANAGEMENT Hourly rate for Senior Project Management to assist implementing customer projects.	$ 300.00	0.00%	$ 300.00
			$ -
SERVICE, DATA SYSTEM ENGINEER Hourly rate for Data System Engineer	$ 187.50	0.00%	$ 187.50
			$ -
SERVICE, SENIOR SYSTEM TECHNICIAN, Hourly RATE Hourly rate for Senior Technicians to perform installation, testing, system alignment or evaluate special applications. Travel and living will be billed inaddition to this fee	$ 150.00	0.00%	$ 150.00
			$ -
SERVICE, SYSTEM TECHNICIAN, Hourly RATE Hourly rate for Technicians to perform installation, testing, system alignment or evaluate special applications. Travel and living will be billed inaddition to this fee	$ 125.00	0.00%	$ 125.00

TABLE B.13 - SYSTEM POST-WARRANTY SUPPORT

This Table is for SYSTEM POST-WARRANTY SUPPORT (Years 2-3 included in base contract price as extended warranty. Years 4 - 10 will be included in a separate mainteance contract price)

Table B.13.A - NDOT TECHNICAL SUPPORT SERVICE

List the price for TECHNICAL SUPPORT that commences upon expiration of the one-year warranty.

Description	Services Price
Technical Support for Year 2 - Extended Warranty	$ 32,720.00
Technical Support for Year 3 - Extended Warranty	$ 32,720.00
Technical Support for Year 4 - Maintenance	$ 32,720.00
Technical Support for Year 5 - Maintenance	$ 32,720.00
Technical Support for Year 6 - Maintenance	$ 32,720.00
Technical Support for Year 7 - Maintenance	$ 32,720.00
Technical Support for Year 8 - Maintenance	$ 32,720.00
Technical Support for Year 9 - Maintenance	$ 32,720.00
Technical Support for Year 10 - Maintenance	$ 32,720.00
TOTAL Technical Support for Years 2-10	**$ 294,480.00**

Table B.13.B - NDOT SOFTWARE SUPPORT AND UPGRADES

List the price for SOFTWARE SUPPORT AND UPGRADES that are available after the one-year warranty period ends.

Description	Services Price
Software Support and Upgrades for Year 2 - Extended Warranty	$ 118,237.00
Software Support and Upgrades for Year 3 - Extended Warranty	$ 131,563.00
Software Support and Upgrades for Year 4 - Maintenance	$ 157,375.00
Software Support and Upgrades for Year 5 - Maintenance	$ 158,322.00
Software Support and Upgrades for Year 6 - Maintenance	$ 159,289.00
Software Support and Upgrades for Year 7 - Maintenance	$ 160,278.00
Software Support and Upgrades for Year 8 - Maintenance	$ 161,287.00
Software Support and Upgrades for Year 9 - Maintenance	$ 162,319.00
Software Support and Upgrades for Year 10 - Maintenance	$ 163,374.00
TOTAL Software Support and Upgrades for Years 2-10	**$ 1,372,044.00**

Table B.13.C - NDOT EXTENDED WARRANTY

List prices for EXTENDED WARRANTY available after the full one-year warranty.

Description	Services Price
Extended Warranty for Year 2 - Infrastructure & Radios -Extended Warranty	$ 866,685.00
Extended Warranty for Year 3 - Infrastructure & Radios -Extended Warranty	$ 962,717.00
Extended Warranty for Year 4 - Infrastructure & Radios - Maintenance	$ 1,100,637.00
Extended Warranty for Year 5 - Infrastructure & Radios - Maintenance	$ 1,120,212.00
Extended Warranty for Year 6 - Infrastructure & Radios - Maintenance	$ 1,156,021.00
Extended Warranty for Year 7 - Infrastructure & Radios - Maintenance	$ 1,176,388.00
Extended Warranty for Year 8 - Infrastructure & Radios - Maintenance	$ 1,197,161.00
Extended Warranty for Year 9 - Infrastructure & Radios - Maintenance	$ 1,218,350.00
Extended Warranty for Year 10 - Infrastructure & Radios - Maintenance	$ 1,239,963.00
TOTAL Extended Warranty for Years 2-10	**$ 10,038,134.00**
TOTAL NDOT SYSTEM POST-WARRANTY SUPPORT	**$ 11,704,658.00**

TABLE B.14 - DISPATCH EQUIPMENT AND SERVICES

This Table is for dispatch equipment and logging recorders that may be procured by the Members as part of the contract and/or future purchase(s).

Table B.14.A - NDOT DISPATCH EQUIPMENT

Item	Unit Price	Qty	Extended Price	Discount %	Discounted Price
Dispatch console - Symphony Console w/AES Ecrypt, 2 spkrs, 21.5" Monitor, Headset, and Desk Mic (Fast Center)	$ 58,500.00	2	$ 117,000.00	26%	$ 86,580.00
Dispatch console - Symphony Console w/AES Ecrypt, 2 spkrs, 21.5" Monitor, Headset, and Desk Mic (Elko Radio Shop)	$ 58,500.00	1	$ 58,500.00	26%	$ 43,290.00
Dispatch console - Symphony Console w/AES Ecrypt, 2 spkrs, 21.5" Monitor, Headset, and Desk Mic (Reno Radio Shop)	$ 58,500.00	1	$ 58,500.00	26%	$ 43,290.00
Dispatch console - Symphony Console w/AES Ecrypt, 2 spkrs, 21.5" Monitor, Headset, and Desk Mic (Washington Yard)	$ 58,500.00	1	$ 58,500.00	26%	$ 43,290.00
Dispatch console - Symphony Console w/AES Ecrypt, 2 spkrs, 21.5" Monitor, Headset, and Desk Mic (Carson City/Hot Springs)	$ 58,500.00	1	$ 58,500.00	26%	$ 43,290.00
Dispatch console - Symphony Console w/AES Ecrypt, 2 spkrs, 21.5" Monitor, Headset, and Desk Mic (LCB)	$ 58,500.00	1	$ 58,500.00	26%	$ 43,290.00
Dispatch console - Symphony Console w/AES Ecrypt, 2 spkrs, 21.5" Monitor, Headset, and Desk Mic (Tonopah Radio Shop)	$ 58,500.00	1	$ 58,500.00	26%	$ 43,290.00
Dispatch console - Symphony Console w/AES Ecrypt, 2 spkrs, 21.5" Monitor, Headset, and Desk Mic (Winnemucca Radio Shop)	$ 58,500.00	1	$ 58,500.00	26%	$ 43,290.00
Console/System Interface Equip (Router/Switch) Fast Center, Elko, Elko Radio Shop, Reno, Reno Radio Shop, NHP Carson EOC, Washington Yard, Carson City/Hot Springs, LCB, Tonopah Radio Shop, Winnemucca Radio Shop	$ 8,140.45	11	$ 89,544.95	26%	$ 66,263.26
NDIP Redundant Networking Eqipment (2 sets per site) Carson City, Clark County, Douglas County, Elko County, FAO, Henderson, Lander County, LVMPD, Lyon County, Mesquite, Mineral County, NDOT Dist 1, NDOT Dist 2, NDOT Dist 3, Nellis AFB, NHP Carson, NHP Elko, NHP Las Vegas, North Las Vegas, Pershing County, Reno, Sparks, Storey County, Washoe County	$ 3,850.45	48	$ 184,821.60	26%	$ 136,767.98
UPS 60 Hz Power Supply	$ 3,020.00	9	$ 27,180.00	100%	$ -
Logging Recorder - NDOT (FAST)	$ 541,671.00	1	$ 541,671.00	0%	$ 541,671.00
Logging Recorder - NHP (FAST)	$ 299,411.00	1	$ 299,411.00	0%	$ 299,411.00
				TOTAL NDOT DISPATCH COST	**$ 1,433,723.25**

TABLE B.14 - DISPATCH EQUIPMENT AND SERVICES

DISPATCH SERVICES

EXAMPLES OF DISPATCH SERVICES ARE: engineering, equipment installation, console programming, removal of old equipment, project management, training, software support, etc.

Enter the daily or hourly rate and any applicable discount for each service that can be provided. Add additional rows as needed.

Table B.14.D - NDOT DISPATCH SERVICES

Description	Rate	Total
Installation and Programming	LS	$ 18,000.00
Engineering - Included in Table B.4		
Proj Mgmt - Included in Table B.4		
Training - Included in Table B.4		
Removal of old equipment included in Install and Programming Price		
Misc Services for NDOT console installation included in NDOT Dispatch Equipment total for milestone billing purposes		
TOTAL NDOT DISPATCH SERVICES		**$ 18,000.00**

TOTAL NDOT DISPATCH EQUIPMENT AND SERVICES	**$ 1,451,723.25**

TABLE B.15 - USER RADIO EQUIPMENT AND SERVICES

This Table is for user radio equipment that may be procured by the Members as part of the contract and/or future purchase(s). Portables pricing to include portable battery. Contractor to include optional pricing for each type of radio (portable, mobile, and control station/desktop radio) for:
* OTAR * OTAP *GPS (integrated in the radio) * Intrinsically safe * Voice Playback *Spare battery * Single battery charger * Multiple batteries charger * In-vehicle battery charger * Types of portable belt clips and attachments * Shoulder/lapel mic * Noise cancellation * Wi-Fi Capable *Integrated cellular data modem * Cellular LMR app * P25 Phase 1 & 2 * P25 Trunking * Dual-band (700/800MHz) & VHF * Multi-band * Different Antennas and * Programming cable and any other common features/functionality. Note that all batteries should be of the lithium type.

Table B.15.A - NDOT SUBSCRIBER EQUIPMENT

Item	Unit Price	Qty	Extended Price	Discount %	Discounted Price
User Radios - XG-75M CS-7000 Control Station High Tier with PH 2, LLA, AES Encryption, OTAP, OTAR, Mic, Ant. System (DPS)	$ 14,207.50	15	$ 213,112.50	72.2%	$ 59,245.28
SP721 Digital Remote Controllers - with CAN Bus Extenders (2 per controller) (DPS)	$ 8,295.00	15	$ 124,425.00	72.2%	$ 34,590.15
User Radios - XG-75M CS-7000 Control Station High Tier with PH 2, LLA, AES Encryption, OTAP, OTAR, Mic, Ant. system (District 1)	$ 14,207.50	10	$ 142,075.00	72.2%	$ 39,496.85
SP721 Digital Remote Controllers (District 1)	$ 3,020.00	6	$ 18,120.00	72.2%	$ 5,037.36
IDA Tone Remote Handsets (District 1)	$ 598.75	37	$ 22,153.75	100.0%	$ -
User Radios - XG-75M CS-7000 Control Station High Tier with PH 2, LLA, AES Encryption, OTAP, OTAR, Mic, Ant. system (District 2)	$ 14,207.50	37	$ 525,677.50	72.2%	$ 146,138.35
SP721 Digital Remote Controllers (District 2)	$ 3,020.00	37	$ 111,740.00	72.2%	$ 31,063.72
IDA Tone Remote Handsets (District 2)	$ 598.75	8	$ 4,790.00	72.2%	$ 1,331.62
IDA Tone Remote Handsets (District 3)	$ 598.75	49	$ 29,338.75	72.2%	$ 8,156.17
User Radios - XG-75M CS-7000 Control Station High Tier with PH 2, LLA, AES Encryption, OTAP, OTAR, Mic, Ant. system (District HQ)	$ 14,207.50	1	$ 14,207.50	72.2%	$ 3,949.69
SP721 Digital Remote Controllers (District HQ)	$ 3,020.00	1	$ 3,020.00	72.2%	$ 839.56
User Radios - XG-75M Remote Mount Station Mid Tier with PH 2, LLA, OTAP, Mic, Ant. system (RWIS)	$ 6,317.50	17	$ 107,397.50	72.2%	$ 29,856.51
User Radios - XL-200M Mobile High Tier Front Mount with PH 2, AES Encryption, OTAR, OTAP, GPS, LLA, Mic, Antenna	$ 8,234.50	1298	$ 10,688,381.00	72.2%	$ 2,971,369.92
User Radios - XG-75M Mobile Mid Tier Front Mount with PH 2, AES Encryption, OTAR, OTAP, GPS, LLA, Mic, Antenna	$ 6,264.50	1202	$ 7,529,929.00	72.2%	$ 2,093,320.26
User Radios - XG-75M Mobile Mid Tier Front Mount with PH 2, OTAP, GPS, LLA, Mic, Antenna	$ 5,274.50	521	$ 2,748,014.50	72.2%	$ 763,948.03
User Radios - XG-25M Mobile Low Tier Front Mount with PH 2, OTAP, GPS, LLA, Mic, Antenna	$ 4,456.00	159	$ 708,504.00	72.2%	$ 196,964.11
User Radios - XL-200P Portable High Tier Full KP with PH 2, AES Encryption, OTAR, OTAP, GPS, LLA, Immersible Opt, Battery, Antenna, Belt Clip	$ 7,070.00	1660	$ 11,736,200.00	72.2%	$ 3,262,663.60
User Radios - XL-185P Portable Mid Tier Full KP with PH 2, AES Encryption, OTAR, OTAP, GPS, LLA, Immersible Opt, Battery, Antenna, Belt Clip	$ 5,155.00	840	$ 4,330,200.00	72.2%	$ 1,203,795.60
User Radios - XL-185P Portable Mid Tier Full KP with PH 2, OTAP, GPS, LLA, Immersible Opt, Battery, Antenna, Belt Clip	$ 3,865.00	620	$ 2,396,300.00	72.2%	$ 666,171.40
User Radios - XG-25P Portable Low Tier Partial KP with PH 2, OTAP, GPS, LLA, Battery, Antenna, Belt Clip	$ 3,635.00	205	$ 745,175.00	72.2%	$ 207,158.65
Single Charger - XL200P/XL185P/XG-25P	$ 150.00	3325	$ 498,750.00	72.2%	$ 138,652.50
Existing Radios being upgraded to P25 free of charge					
				TOTAL NDOT SUBSCRIBER COST	**$ 11,863,749.32**

Individual Feature and Accessory Prices (For Information Only)			Discounted Price		
OTAP (OVER-THE-AIR PROGRAMMING)	$ 265.00		$ 196.10	26%	
OTAR (OVER-THE-AIR-REKEYING)	$ 595.00		$ 440.30	26%	
AES Encryption	$ 695.00		$ 514.30	26%	
P25 Trunking	$ 1,500.00		$ 1,110.00	26%	
P25 Phase 2	$ 250.00		$ 185.00	26%	
Dual Band Operation 700/800 and VHF or UHF	$ 1,000.00		$ 740.00	26%	
Multi Band Operation 700/800 and VHF and UHF	$ 1,500.00		$ 1,110.00	26%	
Wi-Fi Capable (XL-200P)	$ 985.00		$ 728.90	26%	
In-Band GPS	$ 200.00		$ 148.00	26%	
BeOn User License	$ 325.00		$ 240.50	26%	
Intrinsically Safe	$ 200.00		$ 148.00	26%	
Li-Ion Battery	$ 150.00		$ 111.00	26%	
Li-Polymer Battery	$ 140.00		$ 103.60	26%	
Single Charger - XL200P	$ 150.00		$ 111.00	26%	
6 Bay Multi Charger - XL200P	$ 795.00		$ 588.30	26%	
Vehicular Charger	$ 175.00		$ 129.50	26%	
Leather Case w/Shoulder Strap	$ 150.00		$ 111.00	26%	
Leather Case w/Belt Loop, D-Swivel	$ 140.00		$ 103.60	26%	
Leather Belt Loop	$ 60.00		$ 44.40	26%	
Belt Clip	$ 25.00		$ 18.50	26%	
Speaker Mic - Premium Fire Mic (Noise Cancelling)	$ 630.00		$ 466.20	26%	
Speaker Mic - Bluetooth Wireless	$ 299.00		$ 221.26	26%	
Speaker Mic	$ 160.00		$ 118.40	26%	
ANTENNA, FLEX, HELICAL, 136-870 MHZ	$ 100.00		$ 74.00	26%	
ANTENNA, WHIP, DUAL-BAND, UHF/700/800 MHZ	$ 50.00		$ 37.00	26%	
ANTENNA, WHIP, 1/2 WAVE 762-870 MHZ	$ 35.00		$ 25.90	26%	

SUBSCRIBER SERVICES

EXAMPLES OF SUBSCRIBER SERVICES ARE: engineering, equipment installation, radio programming, equipment removal,
Enter the daily or hourly rate and any applicable discount for each service that can be provided. Add additional rows as

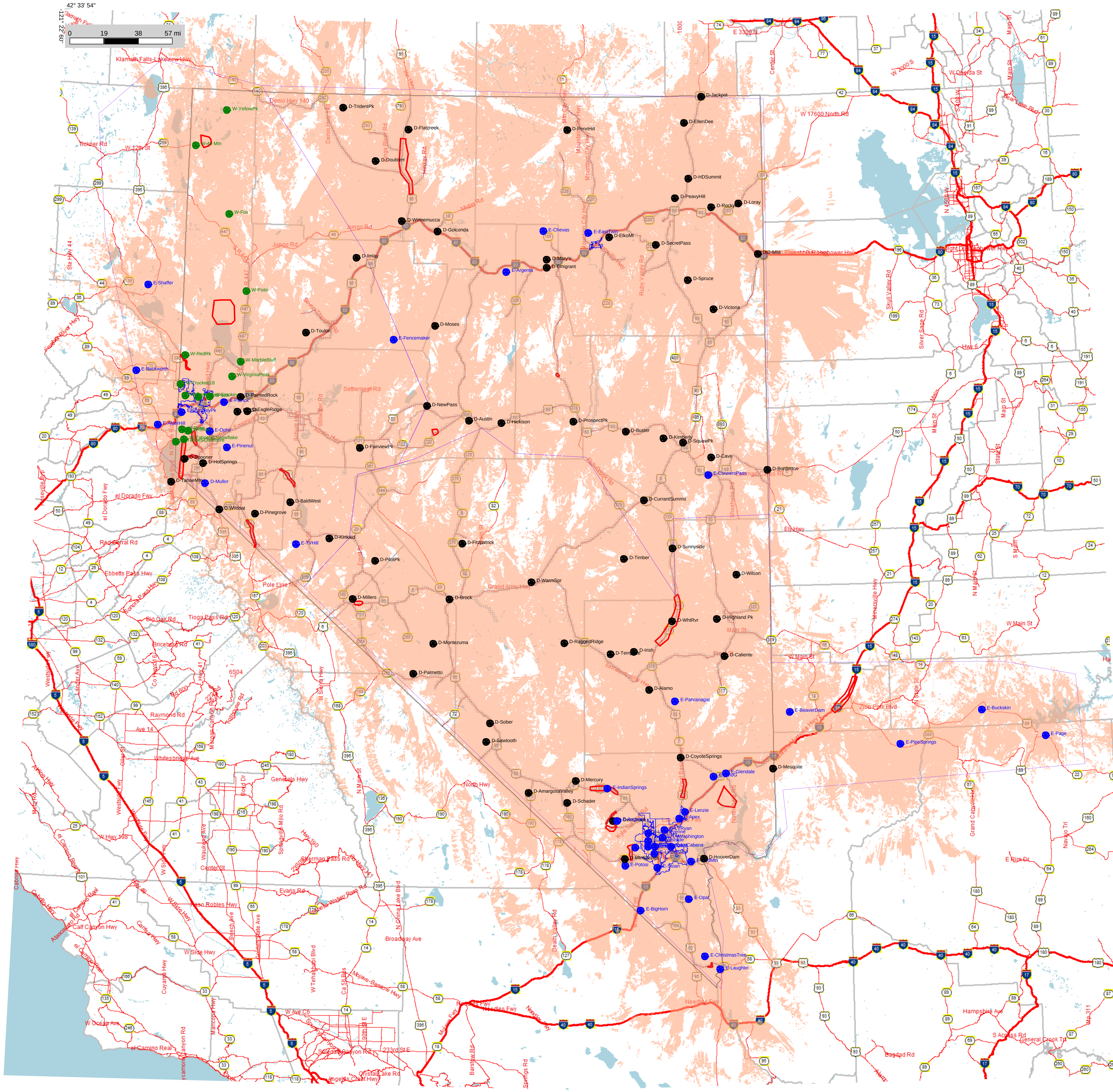
Description	Rate	Discounted Price
Table B.15.D - NDOT SUBSCRIBER SERVICES		
Radio Programming (per radio for quantities in Table B.15.A) Replacement Radios	$ 31.90	$ 210,061.50
Mobile and Desktop Installation (per radio for quantities in Table B.15.A)	$ 450.00	$ 1,467,000.00
TOTAL NDOT SUBSCRIBER SERVICES		**$ 1,677,061.50**

TOTAL NDOT SUBSCRIBER COSTS AND SERVICES	**$ 13,540,810.82**

RF Integrity

RAPTR Version 29.2.440
Tuesday, August 07, 2018 16:55:30
Project: NSRS RAPTR_2016
MBP: 16024
Figure: Fig. 01 NSRS Composite 127 Sites Portable Talk Out (Downlink) DAQ 3.4
Engineer:
Map type - 1:2,350,000
Note: Map depicts coverage across the defined service area. Statistical variability does not allow
for guarantee of coverage in specific locations, but does represent graphically area % coverage.

- NDOT Site
- NVE Site
- Washoe County Site



RF Integrity

RAPTR Version 29.2.440
Wednesday, August 08, 2018 17:37:19
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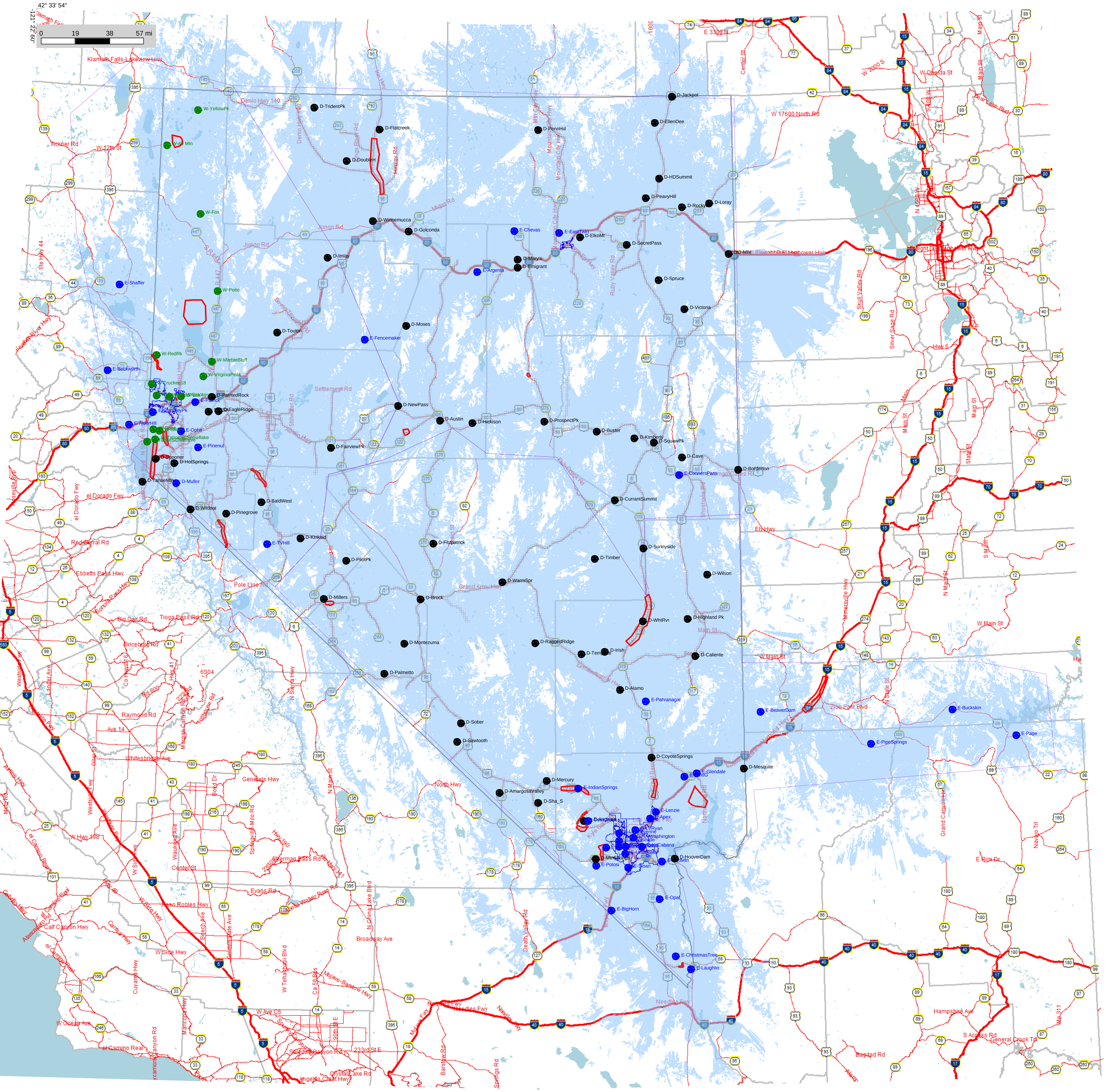
MBP: 16024
Figure: Fig. 02 NSRS Composite 127 Sites Portable TalkBack (Uplink) DAQ 3.4
Engineer:
Map type - 1:2,350,000
Note: Map depicts coverage across the defined service area. Statistical variability does not allow for guarantee of coverage in specific locations, but does represent graphically area % coverage.

- NDOT Site
- NVE Site
- Washoe County Site



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RF Integrity

RAPTR Version 29.2.440
Wednesday, August 08, 2018 16:01:58
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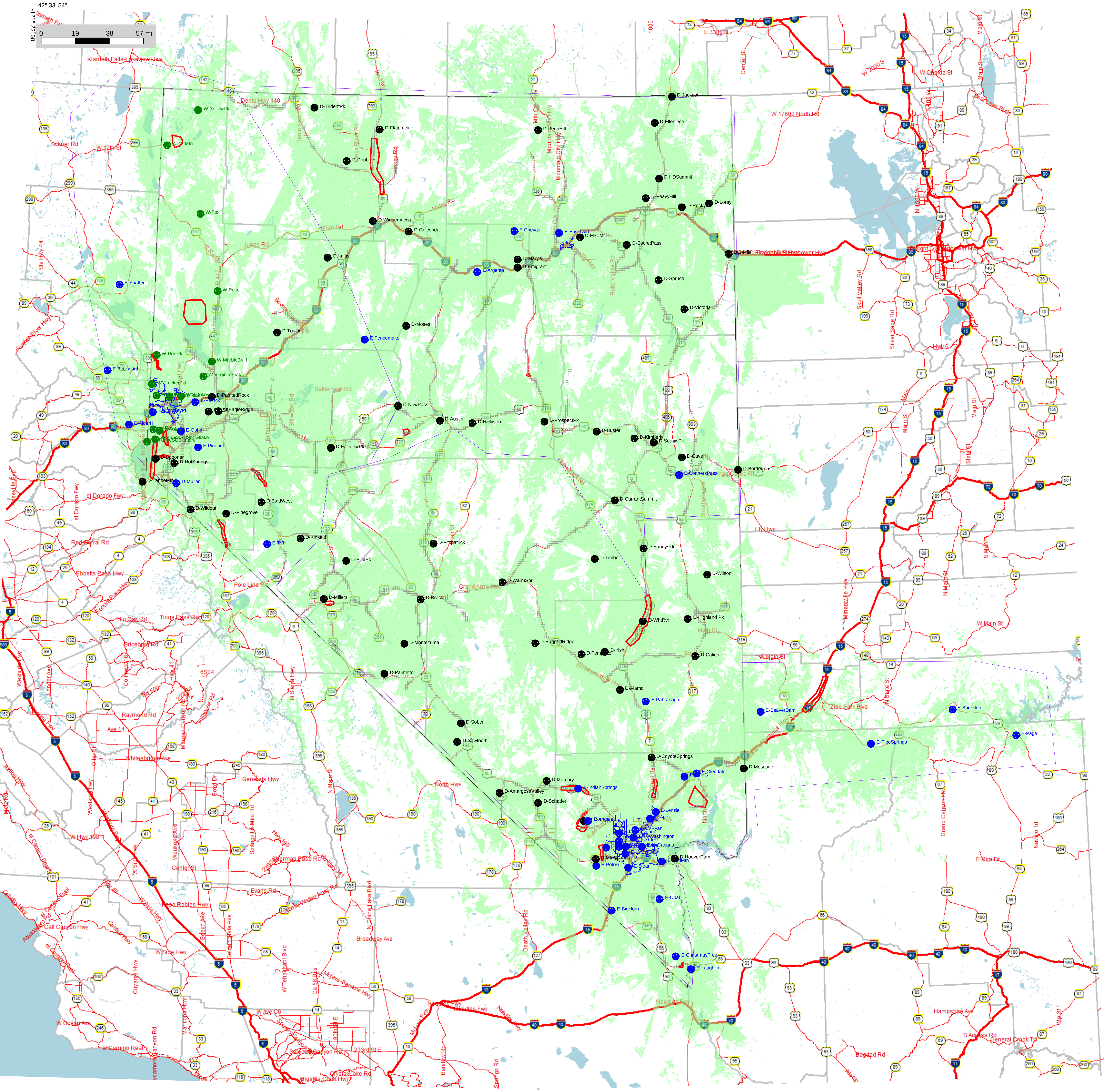
MBP: 16024
Figure: Fig. 03 NSRS Composite 127 Sites Portable Talk Out (Downlink) DAQ 3.4 Indoors FOR INFORMATION ONLY
Engineer:
Map type - 1:2,350,000
Note: Map depicts coverage across the defined service area. Statistical variability does not allow
for guarantee of coverage in specific locations, but does represent graphically area % coverage.

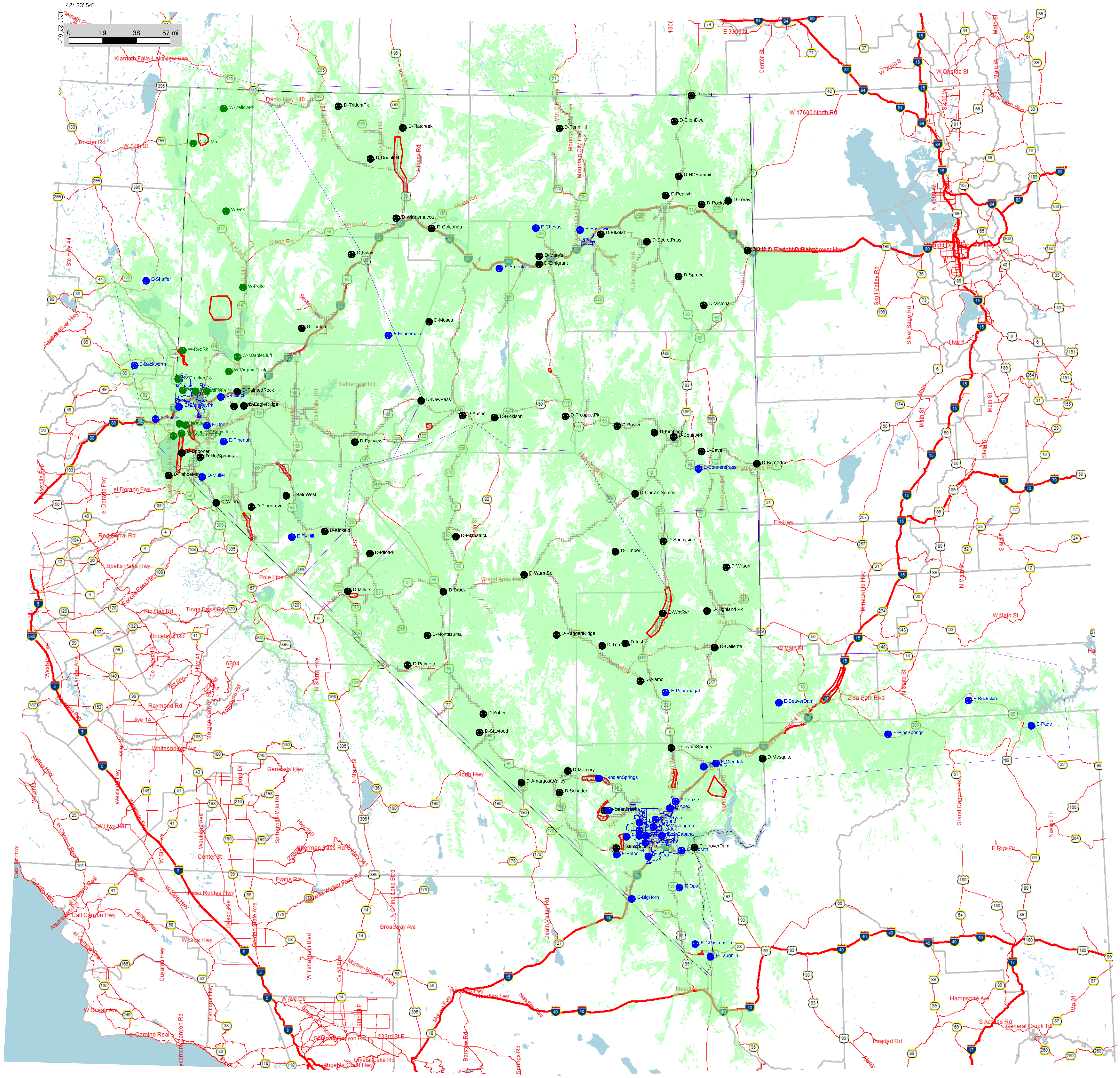
- NDOT Site
- NVE Site
- Washoe County Site



RF Integrity

RAPTR Version 29.2.440
Wednesday, August 08, 2018 16:24:56
Project: NSRS RAPTR_2016
MBP: 16024
Figure: Fig. 04 NSRS Composite 127 Sites Portable TalkBack (Uplink) DAQ 3.4 Indoors FOR INFORMATION ONLY
Engineer:
Map type - 1:2,350,000
Note: Map depicts coverage across the defined service area. Statistical variability does not allow for guarantee of coverage in specific locations, but does represent graphically area % coverage.

- NDOT Site
- NVE Site
- Washoe County Site



RF Integrity

RAPTR Version 29.2.440
Thursday, June 14, 2018 10:55:04
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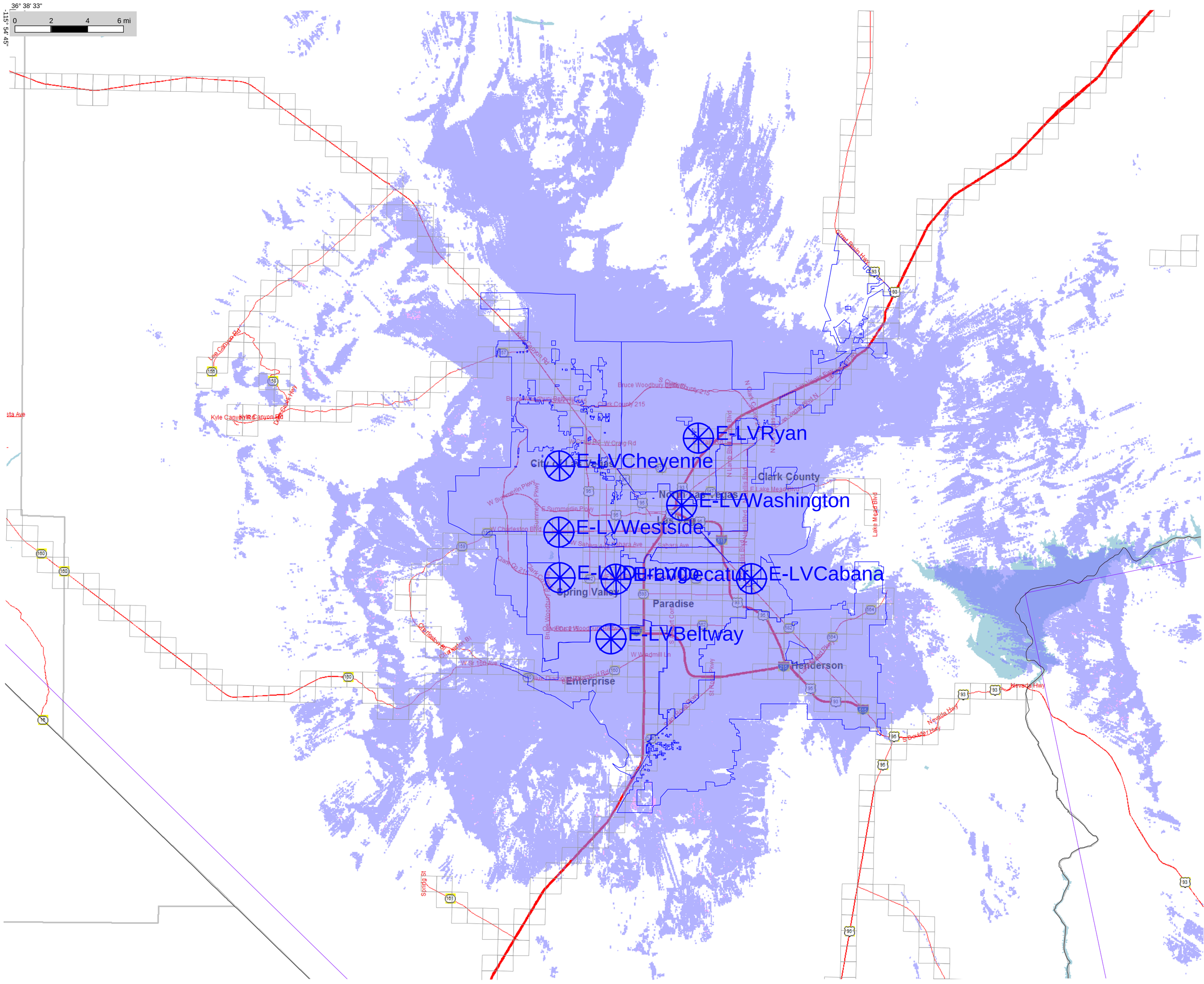
MBP: 16024
Figure: Fig. 05 NVE Las Vegas Simulcast Portable Talk Out (Downlink) DAQ 3.4 FOR INFORMATION ONLY
Engineer:
Map type - 1:295,765
Note: Map depicts coverage across the defined service area. Statistical variability does not allow for guarantee of coverage in specific locations, but does represent graphically area % coverage.

- NDOT Site
- NVE Site
- Washoe County Site



RF Integrity

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Thursday, June 14, 2018 10:55:44
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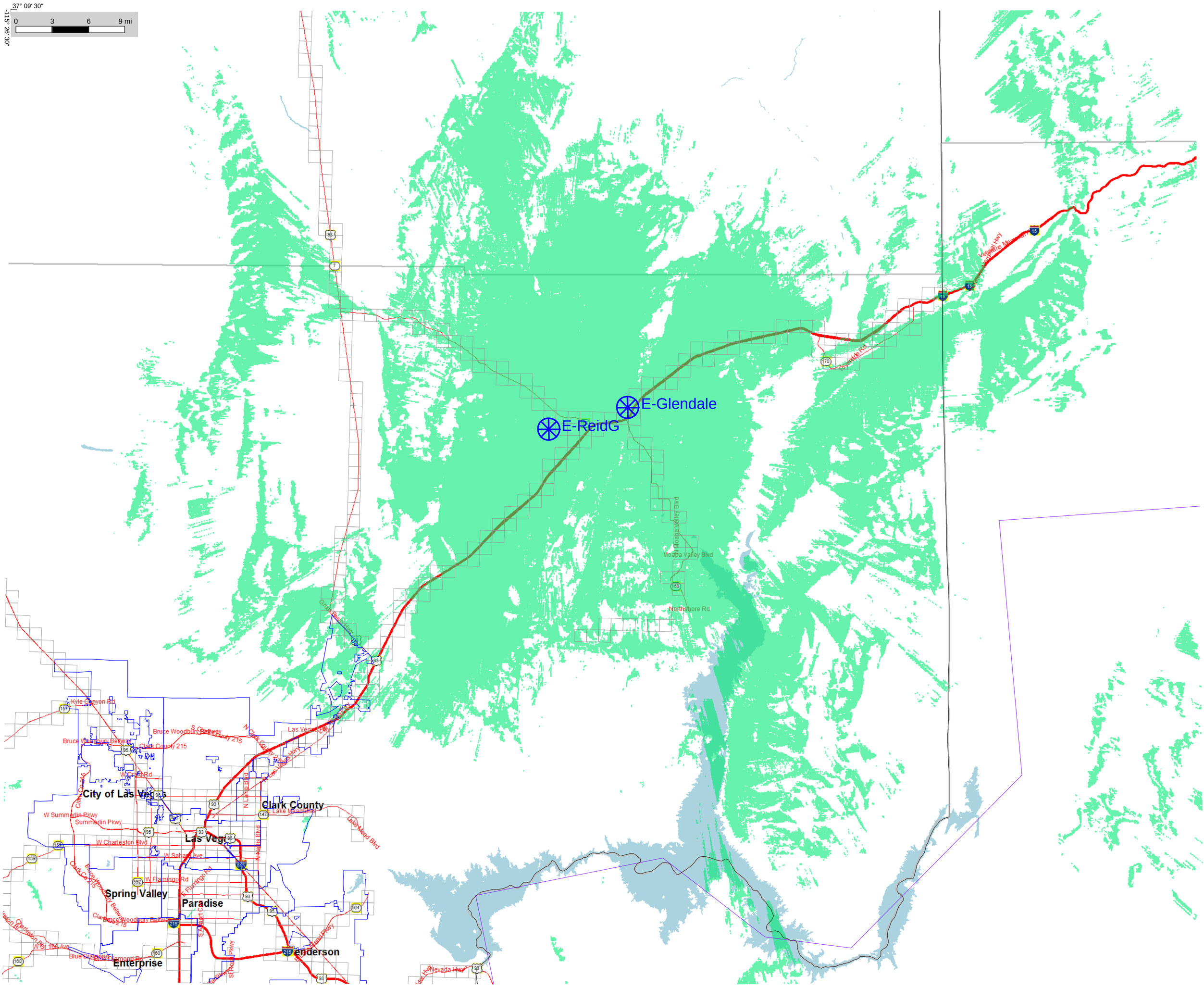
Figure: Fig. 06 NVE Glendale Reid Gardner Simulcast Portable Talk Out (Downlink) DAQ 3.4 FOR INFORMATION ONLY
Engineer:
Map type - 1:381,041
Note: Map depicts coverage across the defined service area. Statistical variability does not allow for guarantee of coverage in specific locations, but does represent graphically area % coverage.

- NDOT Site
- NVE Site
- Washoe County Site



RF Integrity

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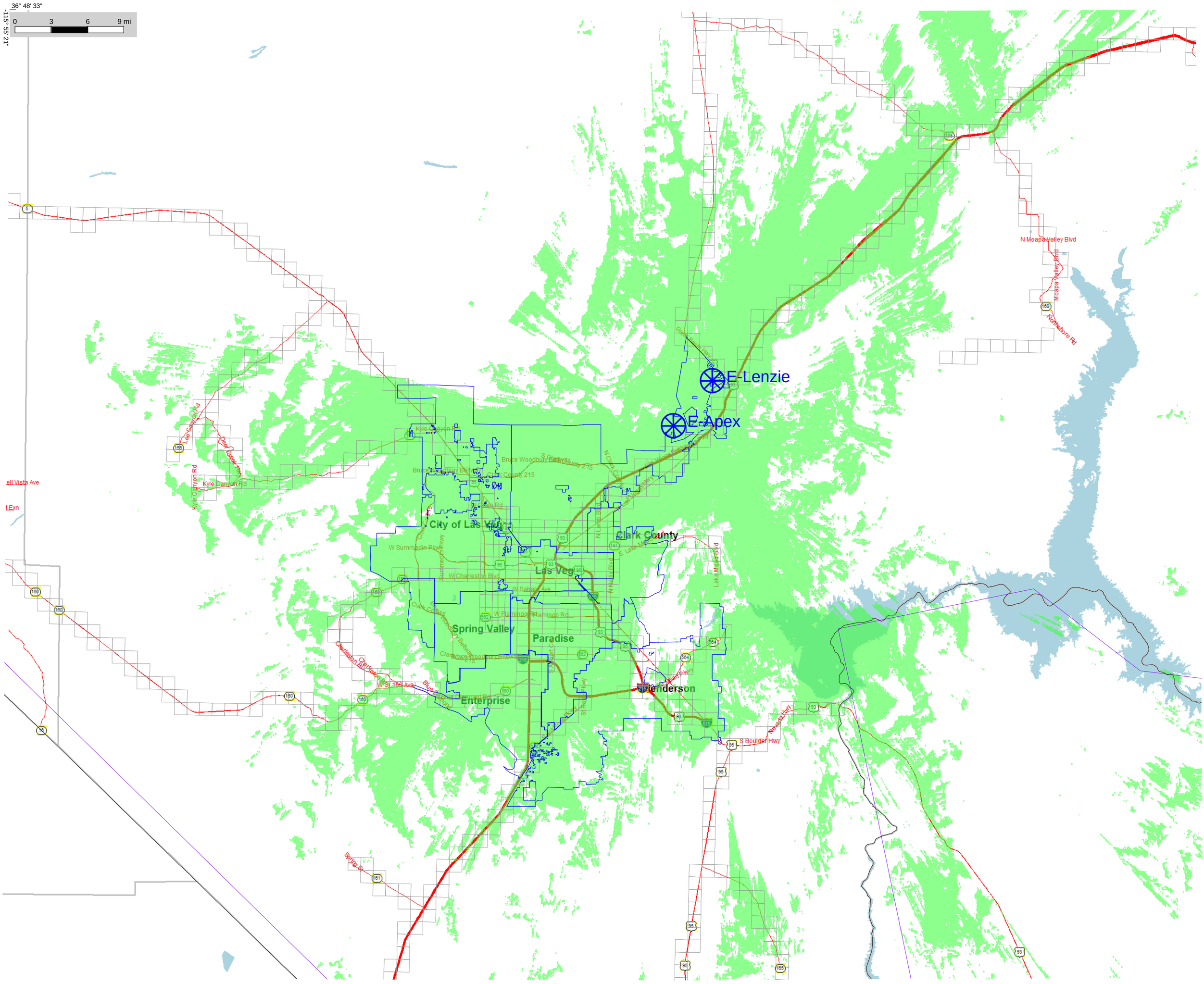
Figure: Fig. 07 NVE Lenzie Apex Simulcast Portable Talk Out (Downlink) DAQ 3.4 FOR INFORMATION ONLY
Engineer:
Map type - 1:365,189
Note: Map depicts coverage across the defined service area. Statistical variability does not allow for guarantee of coverage in specific locations, but does represent graphically area % coverage.

- NDOT Site
- NVE Site
- Washoe County Site



RF Integrity

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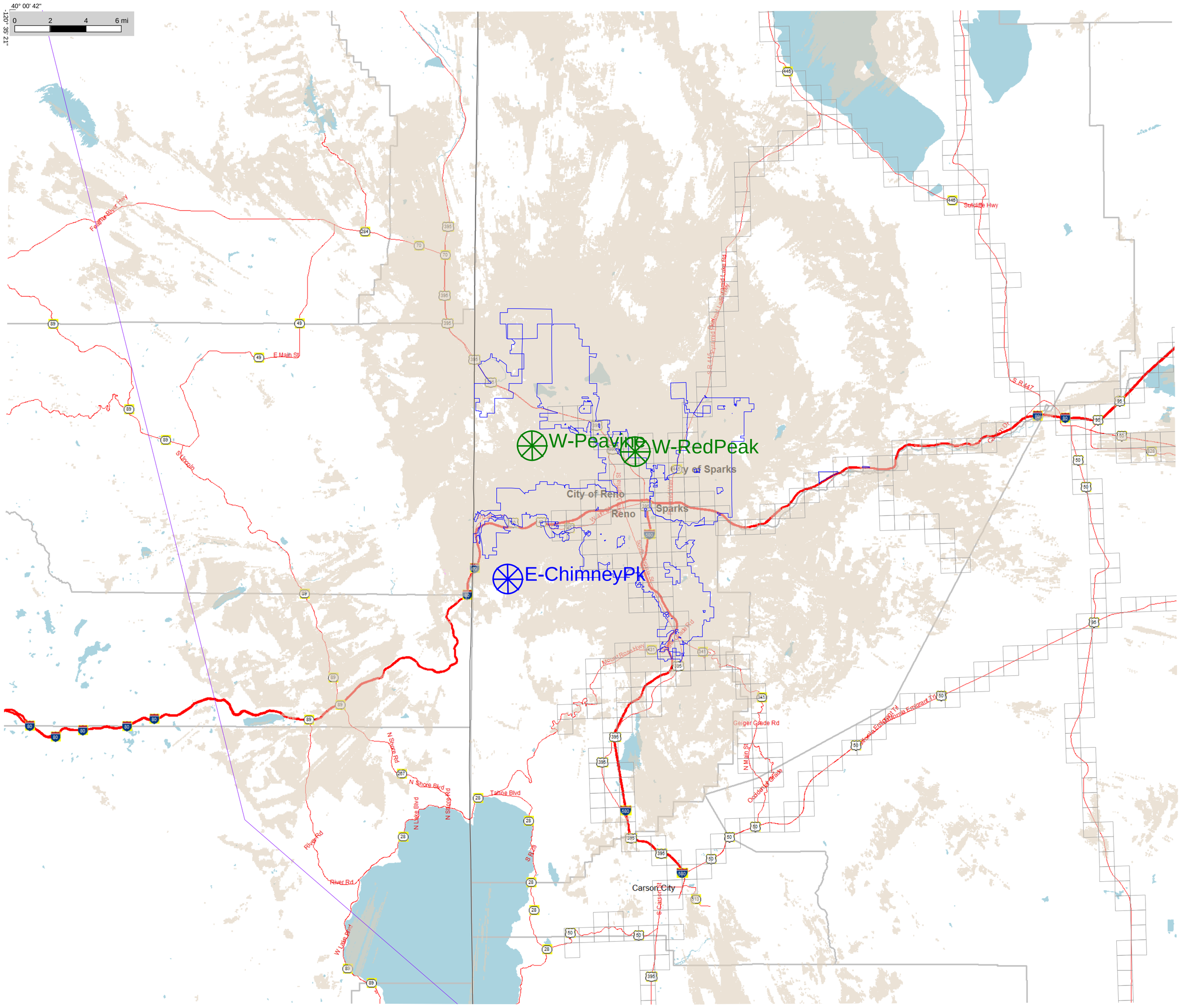
MBP: 16024
Figure: Fig. 08 Washoe Metro Chimney Pk Simulcast Portable Talk Out (Downlink) DAQ 3.4 FOR INFORMATION ONLY
Engineer:
Map type - 1:303,186
Note: Map depicts coverage across the defined service area. Statistical variability does not allow for guarantee of coverage in specific locations, but does represent graphically area % coverage.

- NDOT Site
- NVE Site
- Washoe County Site



RF Integrity

RAPTR Version 29.2.440
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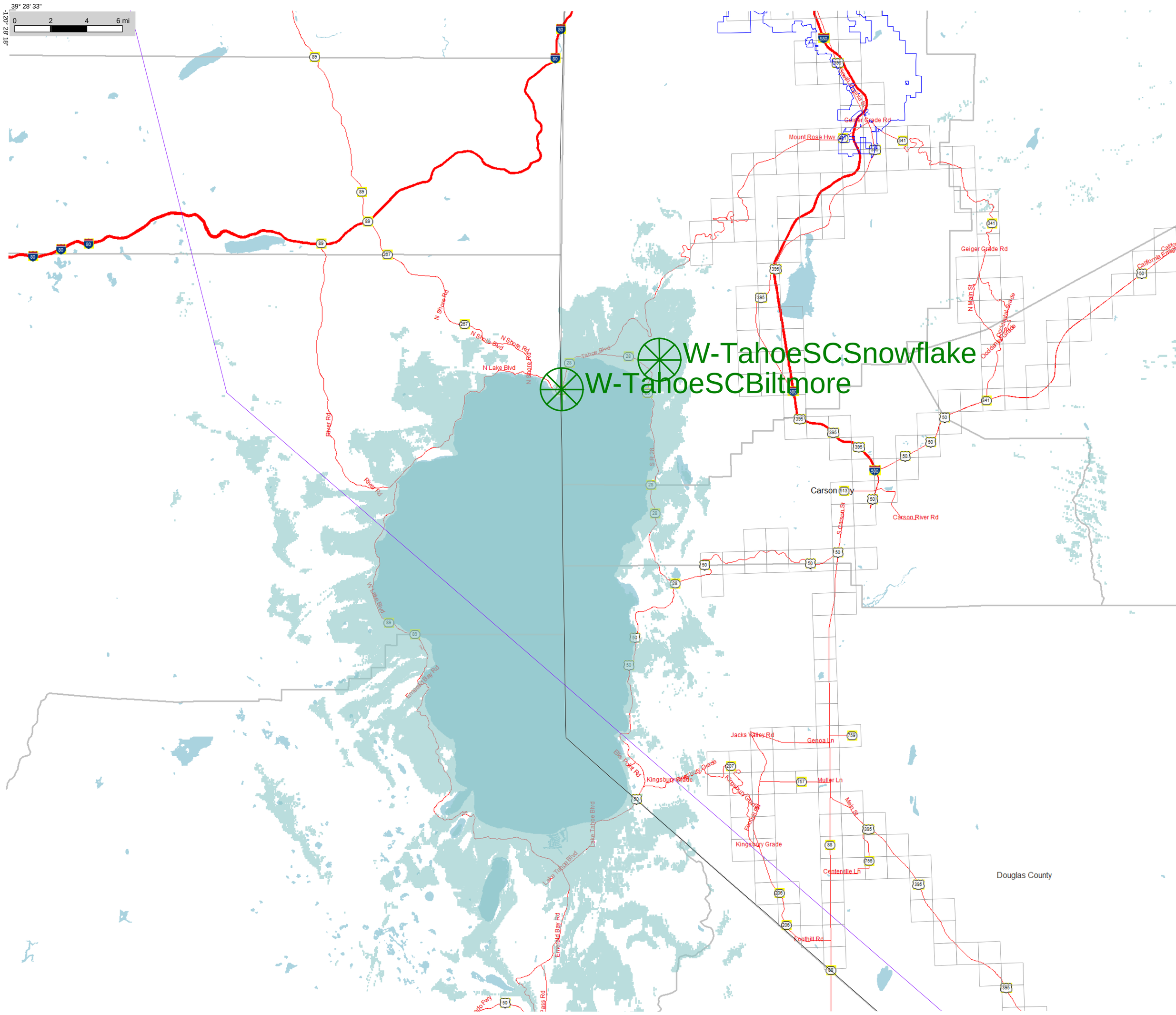
MBP: 16024
Figure: Fig. 09 WashoeTahoe Simulcast Portable Talk Out (Downlink) DAQ 3.4 FOR INFORMATION ONLY
Engineer:
Map type - 1:206,797
Note: Map depicts coverage across the defined service area. Statistical variability does not allow for guarantee of coverage in specific locations, but does represent graphically area % coverage.

- NDOT Site
- NVE Site
- Washoe County Site



RF Integrity

RAPTR Version 29.2.440
Thursday, July 12, 2018 16:11:26
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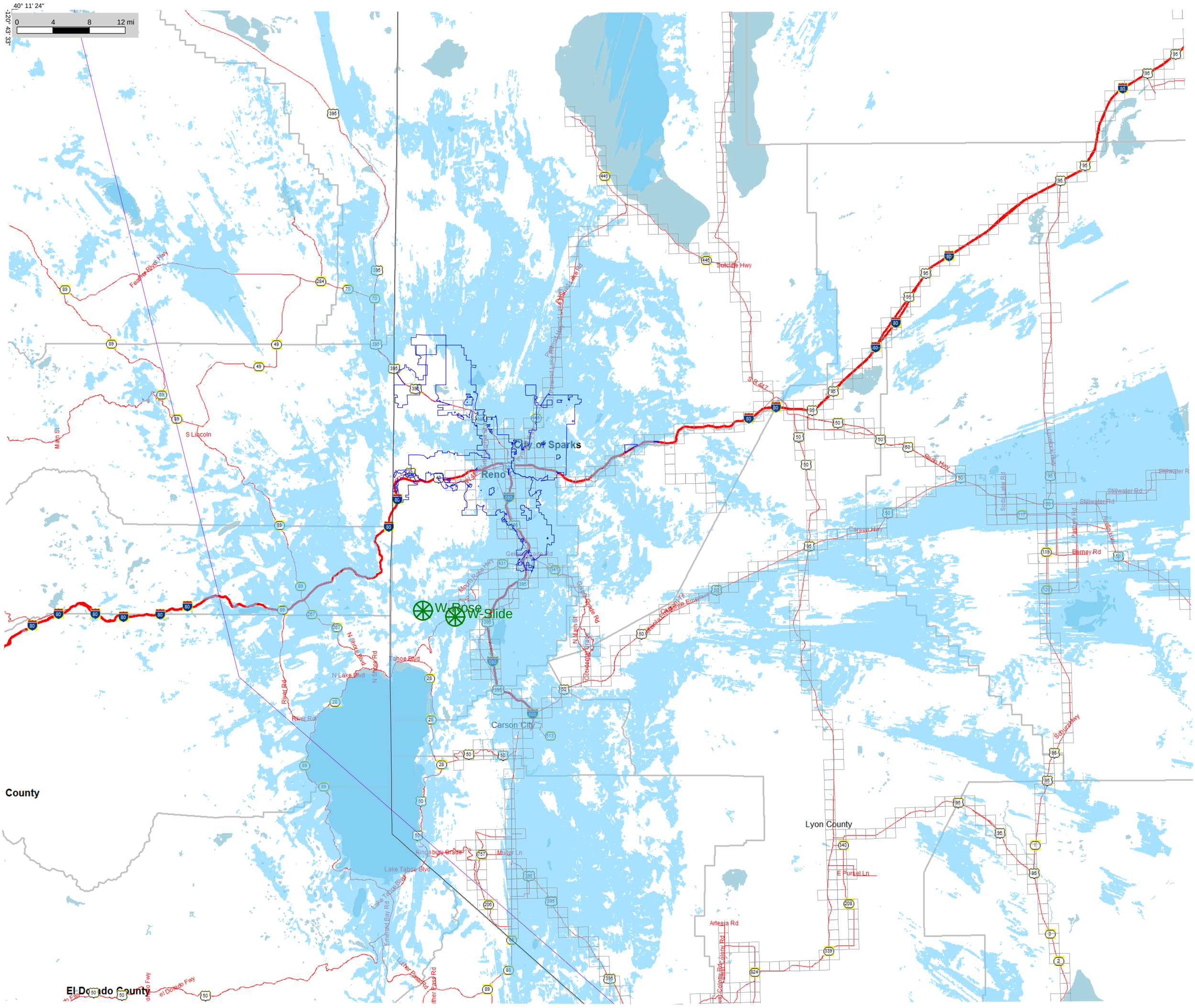
MBP: 16024
Figure: Fig. 10 Washoe Slide Rose Simulcast Portable Talk Out (Downlink) DAQ 3.4 FOR INFORMATION ONLY
Engineer:
Map type - 1:458,903
Note: Map depicts coverage across the defined service area. Statistical variability does not allow for guarantee of coverage in specific locations, but does represent graphically area % coverage.

- NDOT Site
- NVE Site
- Washoe County Site



RF Integrity

RAPTR Version 29.2.440
Thursday, June 14, 2018 10:59:50
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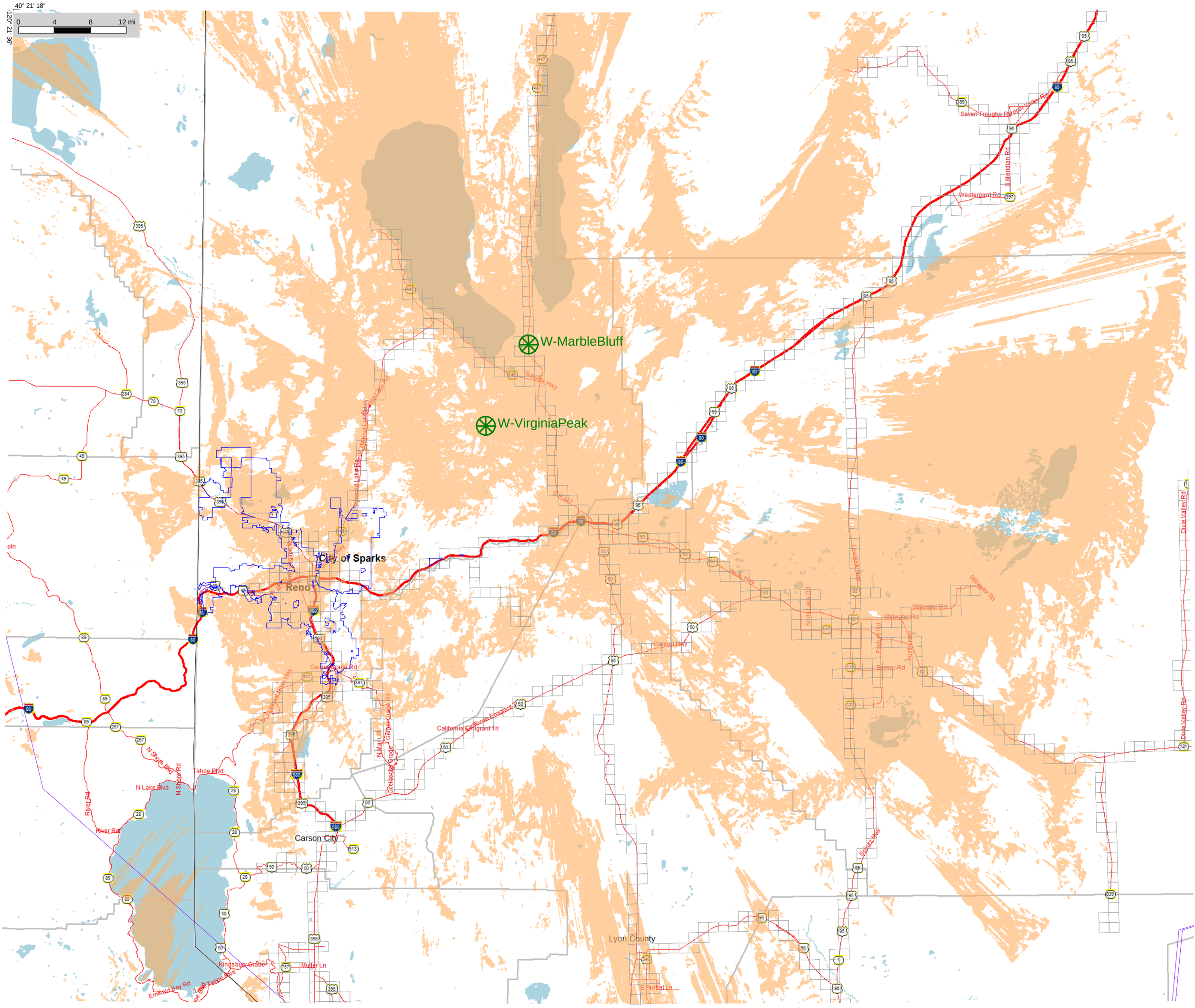
MBP: 16024
Figure: Fig. 11 Washoe Marble Virginia Simulcast Portable Talk Out (Downlink) DAQ 3.4 FOR INFORMATION ONLY
Engineer:
Map type - 1:457,845
Note: Map depicts coverage across the defined service area. Statistical variability does not allow for guarantee of coverage in specific locations, but does represent graphically area % coverage.

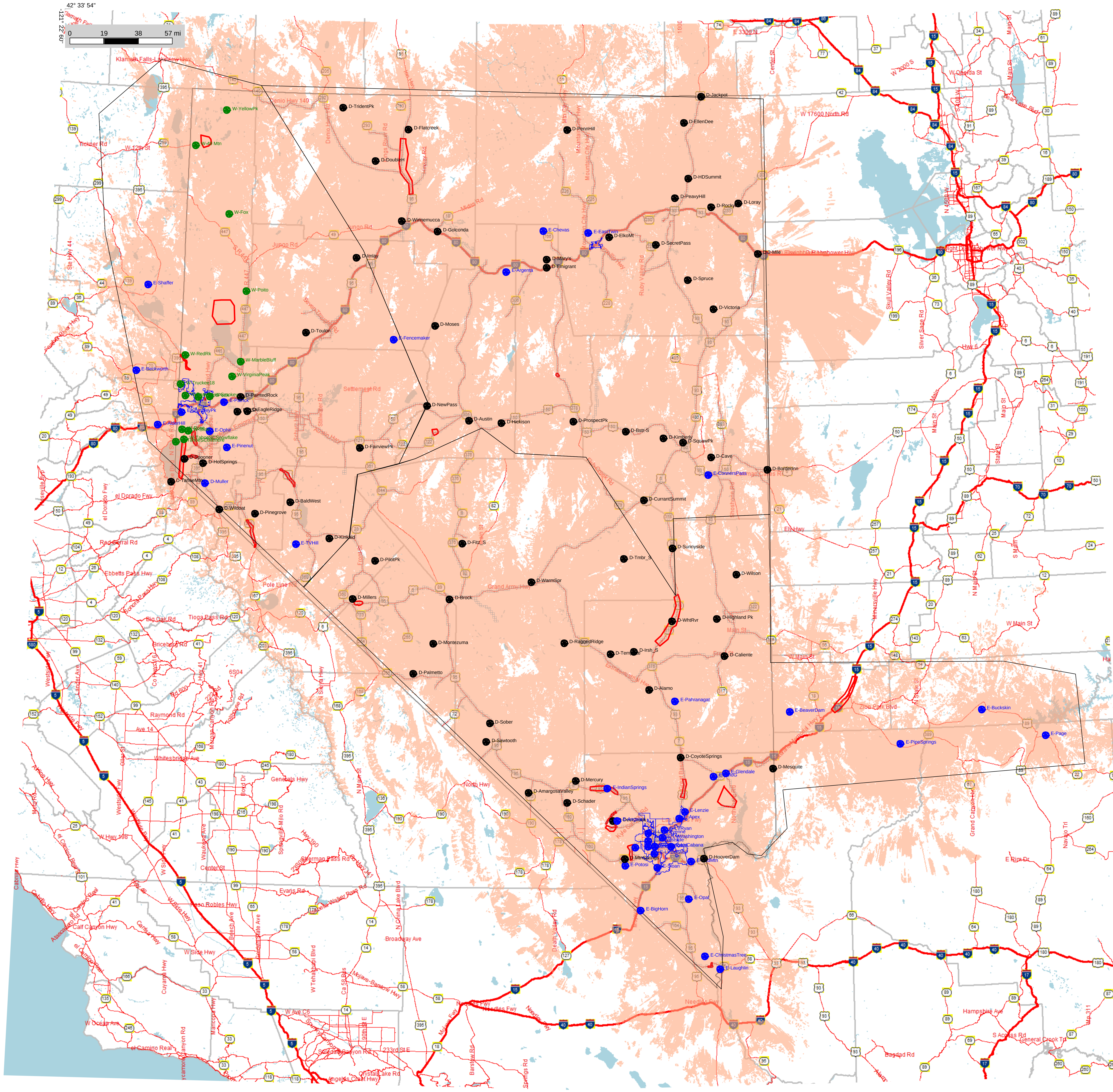
- NDOT Site
- NVE Site
- Washoe County Site



RF Integrity

RAPTR Version 29.2.440
Tuesday, August 07, 2018 17:07:44
Project: NSRS RAPTR_2016
MBP: 16024
Figure: Fig. 12 NSRS Composite 126 Sites Mobile Talk Out (Downlink) DAQ 3.4 FOR INFORMATION ONLY
Engineer:
Map type - 1:2,350,000
Note: Map depicts coverage across the defined service area. Statistical variability does not allow for guarantee of coverage in specific locations, but does represent graphically area % coverage.

- NDOT Site
- NVE Site
- Washoe County Site



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RAPTR Version 29.2.440
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Figure: Fig. 13 NSRS Composite 126 Sites Mobile Talk Back (Uplink) DAQ 3.4 FOR INFORMATION ONLY
Engineer:
Map type - 1:2,350,000
Note: Map depicts coverage across the defined service area. Statistical variability does not allow for guarantee of coverage in specific locations, but does represent graphically area % coverage.

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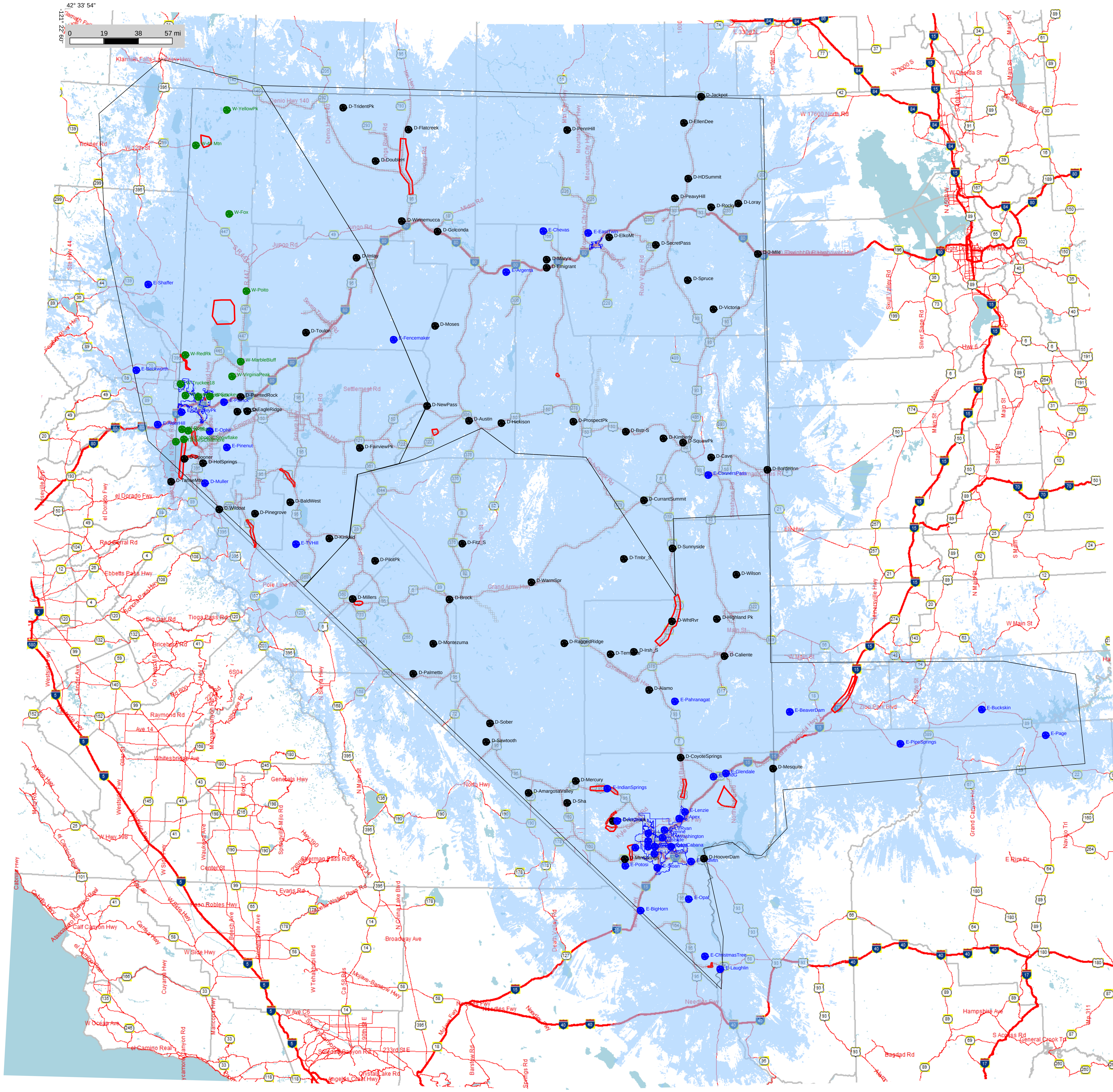
- NDOT Site
- NVE Site
- Washoe County Site



RF Integrity

RAPTR Version 29.2.440
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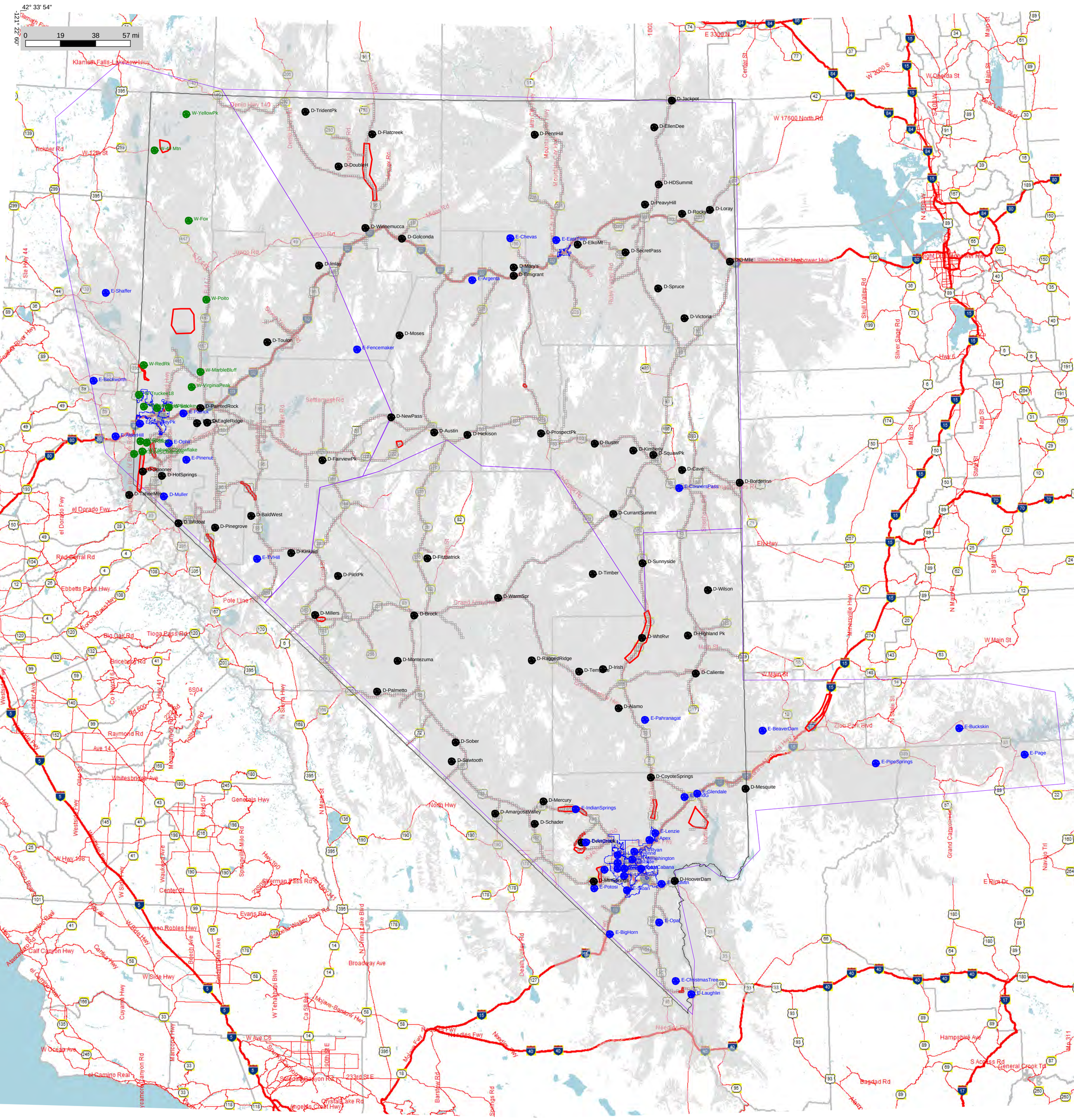
Figure: Fig. 14 NSRS Composite 127 Sites Portable Talk Out (Downlink) DAQ 3.0 FOR INFORMATION ONLY
Engineer:
Map type - 1:2,350,000
Note: Map depicts coverage across the defined service area. Statistical variability does not allow for guarantee of coverage in specific locations, but does represent graphically area % coverage.

- NDOT Site
- NVE Site
- Washoe County Site



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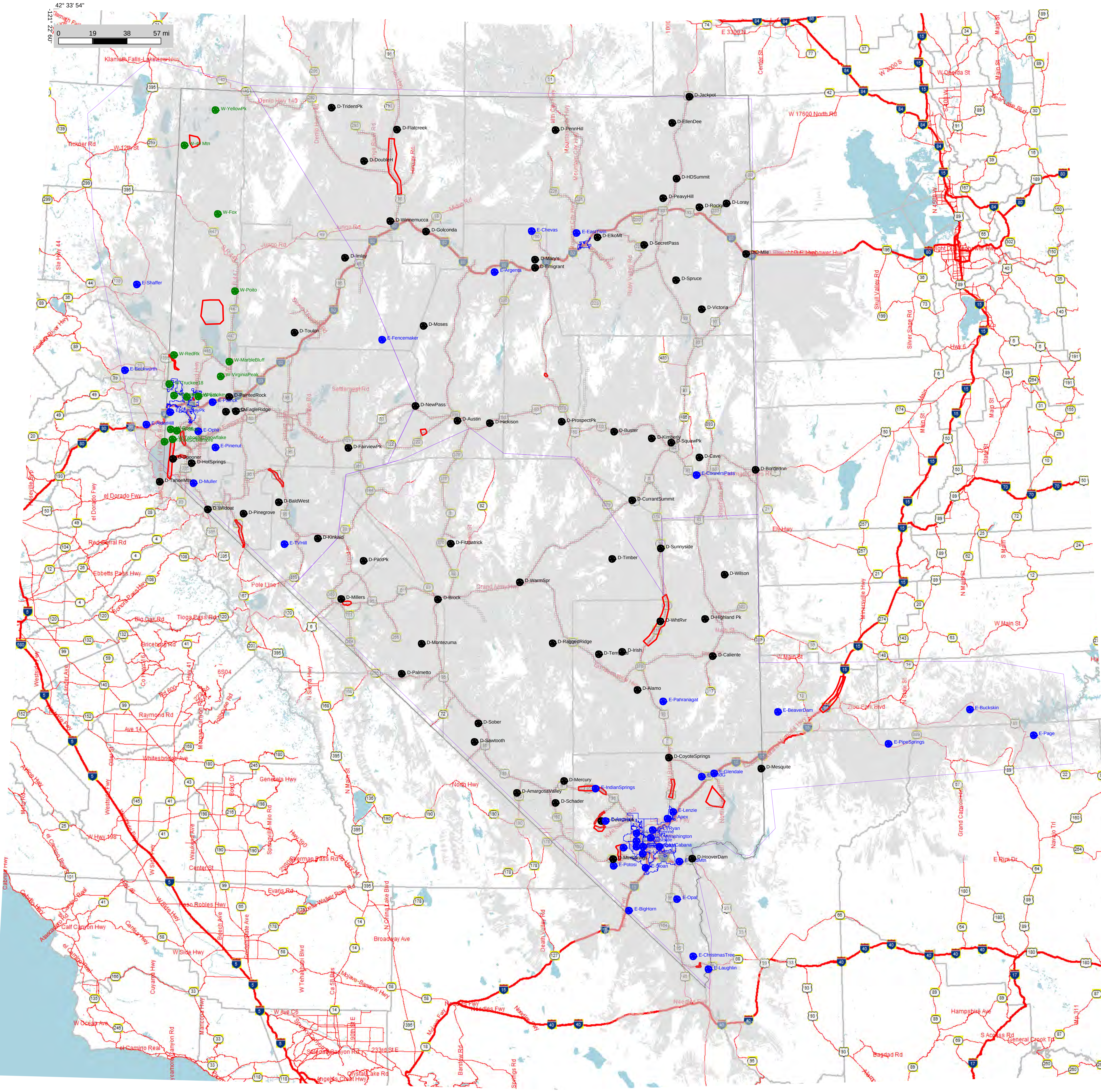
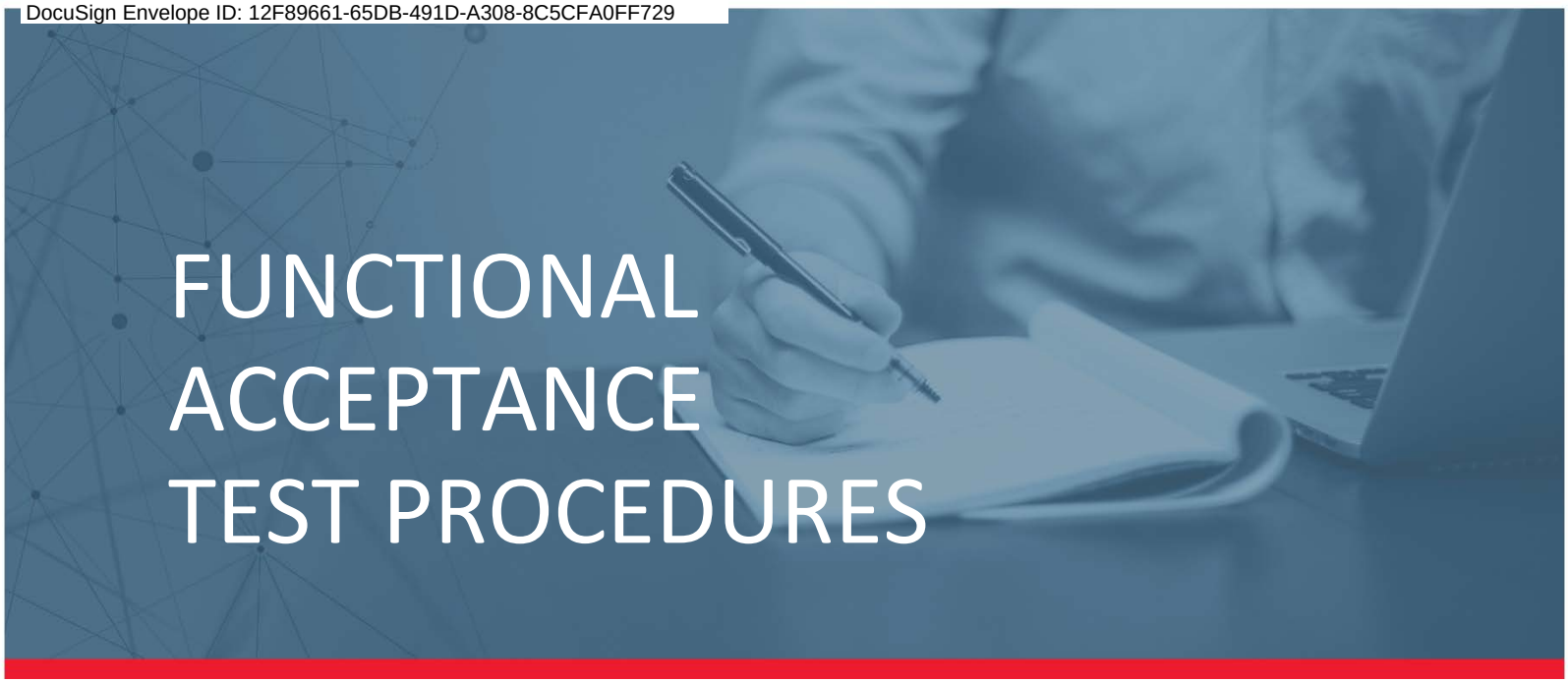
RF Integrity

RAPTR Version 29.2.440
Wednesday, August 08, 2018 17:10:44
Project: NSRS RAPTR_2016
MBP: 16024
Figure: Fig. 15 NSRS Composite 127 Sites Portable Talk Back (Uplink) DAQ 3.0 FOR INFORMATION ONLY
Engineer:
Map type - 1:2,350,000
Note: Map depicts coverage across the defined service area. Statistical variability does not allow for guarantee of coverage in specific locations, but does represent graphically area % coverage.

HARRIS®

- NDOT Site
- NVE Site
- Washoe County Site





FUNCTIONAL ACCEPTANCE TEST PROCEDURES

ABOUT THIS DOCUMENT

This document was specifically prepared for the customer shown below. Each section of this document is individually maintained in the Harris document control system.

Customer: Nevada Department of Transportation

Prepared By: Smitha Paramashivan

DOCUMENT USAGE

Many of the tests in this document will need to be run on multiple pieces of equipment. For tests that need to be run multiple times, log in the comment section of the result box the identifier of the equipment tested. Although specific tests are not included relating to electrical measurements or timing parameters of equipment, these tests and levels are conducted and recorded as part of Harris' standard production and/or installation practices. These parameters include but are not limited to:

- Transmit Frequency and Deviation
- Output and Reflected Power
- Receiver Sensitivity
- Receiver Multicoupler Gain (if applicable)
- Receiver Preamplifier Gain (if applicable)
- Combiner Loss (if applicable)
- Audio line out
- Audio line in

SUBSCRIBER UNIT USAGE

All tests for subscriber (terminal) units in this document will be performed with Harris subscriber units unless the test setup identifies another Vendor's subscriber unit to be used.

1. CUSTOMER APPROVAL

These Test Procedures have been read and approved for use as the Functional System Acceptance Test.

Customer Representative	**Harris Corporation Representative**
Signature and Date	Signature and Date
Printed name and title	Printed name and title

2. SYSTEM ACCEPTANCE

This Acceptance Test Procedure has been fully and successfully completed with all action items resolved.

Customer Representative	**Harris Corporation Representative**
Signature	Signature
Printed name and title	Printed name and title
Date	Date

FUNCTIONAL TESTING CLARIFICATION

Equipment inspection and testing in addition to staging acceptance testing is performed at the Harris staging facility. Staging tests as detailed in this matrix verify basic equipment functionality in addition to its functionality as part of an overall system. Equipment as received from Harris and third party manufacturing suppliers is supplied with manufacturer test results, as applicable. Test results documentation will be that from the staging functional acceptance tests. Equipment tests will be performed in the field after installation both as part of equipment commissioning and overall final functional acceptance testing. Test results documentation will be from the final functional acceptance tests.

3. Facility Test [Field Tests]

3.1 Visual Inspection [Field Tests]

Purpose: **Verify the system has been installed following Harris installation standards.**

Expected Results: **The installation should look clean and the documentation should reflect the installation.**

Setup:

None

Execution:

- ☐ Verify the area is clean and that all cabinets and racks are both clear of debris and clean.
- ☐ Verify all equipment racks are spaced per the drawings, secured and grounded.
- ☐ Verify all nameplates and labels are in place.
- ☐ Verify all protective foam, tape, and packing material has been removed.
- ☐ Verify all punchblocks are labeled.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

3.2 Power Backup / UPS Verification [Field Tests]

Purpose: **To verify that the site can run on the UPS without interruptions.**

Expected Results: **Radio communication should not be interrupted during the transition.**

Setup: **Prior to the execution of this test, ensure any computers or other devices with volatile memory are backed up or are on power circuits not affected by this test.**

Notes: **Harris will perform this test at all locations. Harris is not responsible for test failures due to inadequate backup power equipment that is under the NDOT's responsibility to provide. Any such failures of NDOT provided backup power equipment will not delay system acceptance. Record in the comments section the names of locations tested and who has provided the backup power equipment (Harris or NDOT).**

Execution:

1. From the facility circuit breaker panel, disconnect main power.
   - ☐ Verify communication is uninterrupted.
2. After predetermined extent of designed backup power, reapply power.
   - ☐ Verify communication is uninterrupted.

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

4. VIDA UNIVERSAL ADMINISTRATION SERVER (UAS)

4.1 Create an Agency Level Administrator Account in the UAS

Purpose: **Demonstrate the capability to create Agency Admin Accounts in the UAS.**

Expected Results: **This test will create a new Agency Level Administrator account.**

Setup: **Need system level access to an UAS or UAS Client. Predefined Agency and Region in the UAS.**

Execution:

1. Browse to the UAS at the address of 'https://s0u1uas.vida.local:8443/nas'
2. Log in with UAS administrator level account.
   - Verify that default accounts are created (see list below) and verify a default Agency administrative class, by selecting System/Administration/Admin User.
3. Select "Add" to display the Administration User Detail screen.
4. Enter a name (e.g., TestAgency), description, and password. Select save to download, and click 'OK'.
5. Log out of the default account.
6. Log in with the newTestAgencyAdmin. Verify access to account.
   - Verify access to account.
7. Log out of the Test AgencyAdmin.
8. Log in with the default account and delete the TestAgencyAdmin.

Admin User	Admin Class	Description
agency998	Agency998	Agency 998 Access
Vida	RSA	RSA
ProvTool	RSA	Provtool
vida2	RSA	vida2
Hp	RSA	Hao for Testing

Provtool2	RSA	Provtool
Provtool3	RSA	Provtool
Provtool4	RSA	Provtool
Kc	RSA	Kc

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

4.2 Provision Agency with Talk Groups and Subscriber Units in the UAS

Purpose: **Demonstrate the capability to add talk-groups and users to the Agency accounts in the UAS.**

Expected Results: **This test will show that a user can add a new talk group and users to the system.**

Setup: **System/Region/Agency level access to the UAS or a UAS client.**

Talk Groups				
Name	Description	SPNI	Property Id	Priority Id
64000ALL	TG64000 P25	Full Rate All Call	1	3
64100ALL	TG64100 P25	Full Rate All Call	1	3
64101TCL	TG64101 P25	Full Rate Conf Med Priority	1	4
64102TCM	TG64102 P25	Full Rate Conf Med Priority	1	4
64103TCM	TG64103 P25	Full Rate Conf Med Priority	1	4
64104TCM	TG64104 P25	Full Rate Conf Med Priority	1	4
64105TCM	TG64105 P25	Full Rate Conf Med Priority	1	4
64106TCH	TG64106 P25	P25 Full Rate Conf High Priority	1	4

Radios						
Description	RSI	Protocol Mask	Status	Sub Type	Assigned End User	Algorithm Support
Radio1	9980001	P25	Enabled Unit	Harris P5400	010:998:0001	AES
Radio2	9980002	P25	Enabled Unit	Harris P5400	010:998:0002	AES
Radio3	9980003	P25	Enabled Unit	Harris XG-75 Portable	010:998:0003	AES
Radio4	9980004	P25	Enabled Unit	Harris XG-75 Portable	010:998:0004	AES
Console9101	9989101	P25	Enabled Unit	Maestro Console	010:998:9101	AES

Radio5	9980005	P25	Enabled Unit	Harris XG-75 Portable	010:998:0005	AES
Radio6	9980006	P25	Enabled Unit	Harris XG-75 Portable	010:998:0006	AES
Radio7	9980007	P25	Enabled Unit	Harris XG-75 Portable	010:998:0007	AES
Radio8	9980008	P25	Enabled Unit	Harris XG-75 Portable	010:998:0008	AES
Radio9	9980009	P25	Enabled Unit	Harris XG-75 Portable	010:998:0009	AES
Radio10	9980010	P25	Enabled Unit	Harris XG-75 Portable	010:998:0010	AES

Execution:

1. Log into the UAS with one of the default accounts.

2. Under Agency 998, create a talk group by select ‘R/W Talk Group’ , select Agency/ “agency name”/ R/W Talk Group.

3. Click ‘Add’ and then on the Talkgroup Detail screen input the TG ID in the table below. All setting not listed use auto setting for setting not listed. Click OK and download.

   - Verify the talk group has been added to the list of Talkgroups

4. Using Putty on an SMT, log into a traffic controller at each control point for simulcast and each site for multisite and issue the command ‘show gdb’

   - Verify that group 64454 exits in the traffic controller user data base.

5. Once the group has been verified, delete it from the UAS.

TG Id	Name	Description	SPNI	Property Id
64454	64454ANA	Half Rate Low Priority	1	3

Priority Id	Coverage	Valid Coverage

5	P25Sites_PSAPs	P25Sites_PSAPs

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

4.3 Dynamic Regroup from the UAS

Purpose: **Demonstrate the ability to dynamically regroup Subscriber units from the UAS.**

Expected Results: **This test will combine selected talk groups into a single interop group.**

Setup: **Radios must have "Allow P25T Unsolicited Dynamic Regroup" checked in the radio personality under General Options.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	9980001	TG64051 P25	64001
Radio 2	9980002	TG64052 P25	64002
Radio 3	9980003	TG64053 P25	64003

Execution:

1. At the UAS, select 'Regroup' tab and 'Regroup Profile'.

2. Click 'Add' to add profile detail; name Group 'Regroup1', and Description 'Regroup1 Test'.
   - Define regroup profile; select Agency 998 and 'Talk Group 3'.
   - Select 'OK', and save changes to the UAS.

3. Click 'End User Group' and click 'Add'. Name Group 'Regroup1' and Description 'Regroup1 test'.
   - Select Agency 998 from 'Select a Scope' drop down box.
   - Add 'Radio 1' and 'Radio 2' to the 'Selected' windows.
   - Select 'OK' to close 'End User Group Detail'.
   - Click 'Save' button to Download the new regroup.

4. Click 'Define Regroup' and click 'Add' to name the Regroup 'Regroup1' and Description 'Regroup1 test'.
   - Change 'Profile Name' to 'Regroup1' and change 'End User Group Id' to 'Regroup1'.
   - Click 'OK' and save to click 'Save' the changes to the UAS.

5. Click 'Manage Regroup' check the box for 'Regroup1' and select the button for 'Regroup'.
   - Click 'Save' to start Regroup.
   - Verify that Radio 1 and Radio 2 are forced to 'Talk Group 3'.

6. At 'Radio 1' and 'Radio 2', attempt to change talk groups away from 'Talk Group 3'
   - Verify that both radios are forced to remain on 'Talk Group 3'.

7. PTT 'Radio 1' on 'Talk Group 3'.
   - Verify that 'Radio 3' hears audio on 'Talk Group 3' and can respond.

8. Clear the dynamic regroup from the UAS client.
   - ☐ Verify ‘Radio 1’ and ‘Radio 2’ are no longer forced to ‘Talk Group 3’ (i.e., they can select other predefined Talk-Groups).

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

4.4 Unit Deregistration

Purpose: **Demonstrate that radio will automatically deregister when the radio is turned off.**

Expected Results: **This test will show that radio that is off will not create traffic load demand.**

Setup: **Radio 1 is only radio on 'Talk Group A' for this test.**
All other radios should be on different talk groups.

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	9980001	TG64001 P25	64001
Console	9989101	TG64001 P25	64001

Execution:

1. On a client computer, open the windows internet explorer and browse to https://s0u1rnm.vida.local/nmc. Choose System Map and select 'Launch Application' button. Open Realtime tab and Click Mobiles.
   - ☐ Verify 'Radio 1' LID is shown registered on the site.

2. PTT 'Console' on TG 64001 and verify it communicates on the system to 'Radio 1'.
   - ☐ Return call from 'Radio 1' to 'Console' on TG 64001.

3. Turn off 'Radio 1' and wait for expiration of the radio timeout period.

4. Refresh RNM Mobiles screen periodically and verify Radio 1 deregistered after VNIC Remove Demand Timer has passed.

5. PTT 'Console' on TG 64001, after the expiration of the timeout.
   - ☐ Verify no channel is assigned to site, since no demand exists at the sites.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

4.5 UAS Site Adjacency Configuration

Purpose: **Demonstrate the capability to configure site adjacencies in the UAS.**

Expected Results: **Site adjacencies will be successfully configured and modified.**

Setup: **UAS installed and functioning on System network.**

Execution: Basic test is to follow the manual and SRN instructions to configure site adjacencies using the new graphical interface.

1. In the UAS go to System > System Properties > Site adjacency.
2. Select a site on the left side to configure for adjacency information.
3. Use the left hand side to add adjacencies for the site.
   - ☐ Confirm the adjacent sites are removed from the non-adjacent site list and display correctly on the right side.
4. Use the right hand side to remove a site adjacency.
   - ☐ Confirm the removed adjacency disappears on the right side and is displayed as a non-adjacent site on the left side.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

4.6 Unit Enable/Disable from the UAS

Purpose: **Demonstrate the ability to disable a lost/stolen radio from the UAS.**

Expected Results: **This test will disable & re-enable a designated radio.**

Setup: **Obtain 2 radios switched to the same group and note the IDs. Switch on the radios and ensure that they communicate. Verify all sites are connected to the NSC, and that all sites are online.**

[Note: If a radio is encrypted, Unit Disable will automatically delete the encryption key from the radio, as it is disabled. To restore unit functionality for an encrypted radio, the radio must have the encryption key re-installed**.]**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64001 P25	64001
Radio 4	998005	TG64001 P25	64001

Execution:

1. In the UAS Select TG 64001 on Radios 1, 2, and 4.
   - ☐ Verify that the radios can communicate.

2. From the UAS:
   - ☐ Click Radio 4 ENABLE/DISABLE.
   - ☐ Under the UNIT Enable/Disable tab, enter the ID of radio 4 to be modified.
   - ☐ Select the DISABLE button and check the status.
   - ☐ Attempt to PTT Radio 4 and verify that it will not communicate with the other encrypted radios
   - ☐ PTT Radio 1 and verify that Radio 4 cannot receive the call.

3. Enable the ID of Radio 4.
   - ☐ Verify that the Enable/Disable screen indicates that the Current State of the radio is Enabled.
   - ☐ Confirm that the radios can communicate in unencrypted mode.

4. Switch off Radio 4 and disable it from the Enable/Disable screen.
   - ☐ Switch on the radio and verify that, on logging into the site, it becomes disabled.
   - ☐ Verify that the State settings change to Disabled and that the radios cannot communicate.

5. Enable Radio 4.
   - ☐ Verify that radios can communicate in unencrypted mode.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

5. OVER THE AIR REKEYING (OTAR)

5.1 Generating a system UKEK

Purpose: **This test is setup to verify the KMFs ability to create a UKEK.**

Expected Results: **The KMF will create a UKEK.**

Setup: **This test requires a computer that is on the IP network and has 'Harris Key Manager' installed and running.**

1. Log into the KMF with the administrator level Active Directory Account
2. Open the 'Network KMF Management'
3. Select the UKEK tab
4. Change the 'Save As' text field to '\\fileshare\fileshare\kmf_files\ProvisionFile.ukek'
5. Generate the UKEK file by selecting the 'Export UKEK' button
6. Select the 'SLN Bindings' tab
7. Change the 'Save As' text field to '\\fileshare\fileshare\kmf_files\SlnBindingsReport/xml'
8. Generate the bindings by selecting 'Generate SLN Bindings Report'. This file will be used in a later test.

(Pass/Fail) _____	Tester: _____
Date: _____	Comments: _____
_____	_____
_____	_____
_____	

5.2 UKEK a Radio

Purpose: **This test is setup to verify the KMFs ability to load UKEKs into a radio.**

Expected Results: **The radio should accept the UKEK file developed by the KMF.**

Setup: **This test requires a computer that is on the IP network and has 'Harris Key Manager' installed and running. This test also requires three radios programmed with a talk group utilizing an AES encryption key. All radios should be feature encrypted and enabled for OTAR operation. Two radios should have keys and one radio should not have keys. In test "Unit Enable/Disable from the UAS" they keys were removed from radio 9980005.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64001 P25	64001
Radio 5	998005	TG64001 P25	64001

Execution:

1. On a computer with 'Harris Key Manager' installed, save the file at '\\fileshare\fileshare\kmf_files\ProvisionFile.ukek' to the local computer.
2. Start 'Harris Key Manager' and connect the radio to the local computer.
3. Select 'Tools' -> 'Key Load Wizard' to open key load wizard
4. Select 'Next' -> Load a UKEK file into one or more devices" and open the UKEK file in step 1 and select 'Next'
5. Once the UKEKs are loaded select 'Next'
6. Choose the com port
7. Power on the radio and put the radio into Key Load Mode
8. Select 'Load' to load UKEK into the radio

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

5.3 Warm starting a radio from the UAS Key Management Application

Purpose: **This will test the system's ability to push encryption keys to a radio and the radio to hear other radios on the encrypted talk group.**

Expected Results: **The radio will accept the keys from the system and be able to communicate with other encrypted radios on an encrypted talk group.**

Setup: **This test requires three radios programmed with a talkgroup utilizing an AES encryption key. The radios and talkgroup need to be in a test crypto net in the UAS Key Management Application. The radios should be both feature encrypted and enabled for OTAR operation. Two radios should have working encryption, and Radio 4 should have the ukek load but no keys.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64001 P25	64001
Radio 5	998005	TG64001 P25	64001

Execution

1. PTT all three radios
   - Radios 1 and 2 should communicate normally
   - Radio 1 and 2 should hear calls from radio 5 but radio 5 should not be able to hear calls from the encrypted radios
2. From the UAS, warm start radios 5.
   - The UAS will report "Warm Starting".
3. After the operation is complete, refresh the UAS screen.
   - Verify the UAS reports "Warm Started Success" for radios 5
4. Again PTT radio 1 on the encrypted talk group and talk.
   - Radio 1's transmit (TX) indicator should turn on and be amber.
   - Verify that radio 1 and 2 now decrypt the call's audio.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

5.4 Rekeying and Changing Over a Crypto Net from the UAS

Purpose: **This test will show that the system can change the encryption keys to a new set of keys.**

Expected Results: **After this test is complete the radio will be able to communicate with the new set of keys sent by the system**

Setup: **This test requires three radios programmed with a talk group utilizing an AES encryption key. The radios and talk group need to be in a test crypto net in the UAS Key Management Application. All radios should be feature encrypted and enabled for OTAR operation. The radios should have been warm started previously. If a console and/or GWB are present in the system, then these devices should be included in this test also. They need to be in the same test crypto net as the radios and be programmed with the test talk group. They should have been warm started previously.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64001 P25	64001
Radio 5	998005	TG64001 P25	64001

Execution:

1. Put radios 1, 2 and 5 on the encrypted talk group.
   - Verify that all 3 radios can transmit and receive on the encrypted talk group.
2. Leave radios 1 and 2 powered on and power off Radio 5.
3. From the UAS, rekey the crypto net. The UAS will report “Rekeying” for the crypto net.
4. Select the report icon for the crypto net.
   - Radios 1 and 2 should be shown as “Rekeyed.”
   - Any consoles and/or GWB’s should also be shown as “Rekeyed.”
   - Radio 5 should be shown as “Rekey Failed.”
5. From the UAS, change over the crypto net. It should report “Changing Over” for the crypto net.

6. After the operation is complete, refresh the UAS screen. It should report “Changing Over Complete” for the crypto net

7. Turn on Radio 3. PTT radio 1 on the encrypted talk group and talk. The transmit (TX) indicator should turn on and be amber at radio 1.

   - ☐ Verify that radio 2 but not 3 decrypt the call’s audio.
   - ☐ Verify that any consoles and/or GWB’s decrypt the call’s audio also.

8. PTT Radio 3 on the encrypted talk group and talk.

   - ☐ The transmit (TX) indicator should turn on and be amber at Radio 3.
   - ☐ Verify that radios 1 and 2 decrypt the call’s audio.
   - ☐ Verify that any consoles and/or GWB’s decrypt the call’s audio.

9. From the UAS, do an end user level rekey on Radio 3 for that crypto net.

   - ☐ The UAS will report “Rekeying” for Radio 3.

10. After the operation is complete, refresh the UAS screen. It should now show “Rekeyed” for Radio 3.

    - ☐ Select the report icon for the crypto net. Radios 1, 2, and 3 will be shown as “Rekeyed.”
    - ☐ From the UAS, do an end user change over on Radio 3 for the test crypto net. The UAS will report “Changing Over” for Radio 3.

11. Again PTT radio 1 on the encrypted talk group and talk.

    - ☐ Verify that Radio 1’s transmit (TX) indicator turns amber.
    - ☐ Verify that radio 2 and 3 decrypt the call’s audio.
    - ☐ Verify that any consoles and/or GWB’s decrypt the call’s audio also.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

5.5 Zeroizing a Radio from the UAS Key Management Application

Purpose: **This test will verify the system's ability to delete the keys out of a radio that was encrypted.**

Expected Results: **The test will take a radio that has keys and can communicate with other encrypted radios, and remove the keys so the radio cannot communicate with other encrypted radios.**

Setup: **This test requires three radios programmed with a talk group utilizing an AES encryption key. The radios and talk group need to be in a test crypto net in the UAS Key Management Application. All radios should be feature encrypted and enabled for OTAR operation. The radios should have been warm started previously.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64001 P25	64001
Radio 5	998005	TG64001 P25	64001

Execution:

1. Put radios 1, 2 and 3 on the encrypted talk group.

   - Verify that all 3 radios can transmit and receive on the encrypted talk group.

2. From the UAS, zeroize Radio 3.

   - The UAS will report "Zeroizing" for Radio 3 with the date and time updating to reflect the date and time the operation was initiated.

   - After the operation is complete, refresh the UAS screen. Verify the UAS reports "Zeroized" for Radio 3.

3. PTT radio 1 on the encrypted talk group and talk.

   - The transmit (TX) indicator should turn on and be amber at radio 1.

   - Verify that radio 2 decrypts the call's audio.

   - Radio 3 should hear garbled audio or muted audio.

   - Verify the receive indicator is amber on both radios and the ID of radio 1 should be seen at both radios 2 and 3.

- ☐ Verify Radio 3 shows “No Key 0” when it is PTT’ed on the encrypted talk group.

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

5.6 Rekey A Radio From the Radio

Purpose: **This test will test the system's ability to send keys to a radio when the radio requests the keys.**

Expected Results: **The test will take a radio that has keys and can't communicate with other encrypted radios, and add keys to the radio so it can communicate with the system.**

Setup: **This test requires three radios programmed with a talk group utilizing an AES encryption key. The radios and talk group need to be in a test crypto net in the UAS Key Management Application. All radios should be feature encrypted and enabled for OTAR operation. One of the radios should be the radio that was zeroized in the previous test.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64001 P25	64001
Radio 5	998005	TG64001 P25	64001

Execution:

1. Key Radio 1 on an encrypted talk group.

   - Radio 1 should display 'No key' Radio 2, and 3 should not hear the call.

2. From the menu on Radio 1 select 'Rekey' to request new key for Radio 1.

   - Once the radio receives the encryption keys, key Radio 1 and verify Radio 2, and 3 hear the call.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

5.7 UKEK and Symphony

Purpose: **This test is setup to test the KMFs ability to make UKEK files the Symphony can use.**

Expected Results: **The Symphony should accept the UKEK file developed by the KMF.**

Setup: **This test requires three radios programmed with a talk group utilizing an AES encryption key. All radios should be feature encrypted and enabled for OTAR operation.**

Execution:

1. Start the Symphony Application
2. With an encrypted radio make a call on an encrypted talkgroup,
   - the radio with encryption should play the call,
   - the console will not because it does not have keys.
3. Start the ‘Manual Key Loader’ application.
4. Select ‘Load UKEK’
5. Select the ‘Browse’ button
6. Browse to ‘//fileshare/fileshare/KMF_Files/ProvisionFile.ukek’
7. Select the ‘Load’ button
8. Close the application by hitting the ‘Done’ button.
9. Select ‘Maestro Conductor Application’ from the lower right hand side to the console desktop.
10. Select ‘Load Encryption’ this will bring up a window were the binding and UKEK can be loaded into the console
11. Select the button next to the ‘UKEK’ text field and select the UKEK saved in step 9.
12. Select the button next to the ‘binding’ text field and select the binding saved in step 9.
13. Close the ‘Load Encryption’ pop up.
14. With an encrypted radio make a call on an encrypted talkgroup
    - the radio with encryption should play the call,

- the console will now play the call.

15. Choose the talkgroup that the radios are on and select the ‘Private’ button, this will make the console switch the talkgroup to encrypted mode, the console will display ‘PVT’ on the talkgroup button.

16. PTT the console the call should be heard on the encrypted radios.

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

5.8 Warm Starting a Symphony from the UAS Key Management Application

Purpose: **This will test the system's ability to push encryption keys to a console.**

Expected Results: **The UAS will push keys to the console to allow for communicate on an encrypted talk group.**

Setup: **This test requires three radios programmed with a talkgroup utilizing an AES encryption key. The radios and talkgroup need to be in a test crypto net in the UAS Key Management Application. All radios should be feature encrypted and enabled for OTAR operation. The radios should have their UKEK's loaded but not have any traffic encryption keys. (Delete Keys if required)**

Execution:

1. Attempt to switch a talk group to encrypted mode by selecting the talk group and selecting the private button.

   - ☐ Verify that console will not allow you to encrypt the talkgroup because the console does not have the encryption keys.

2. From the UAS, warm start the console. After the operation is complete, refresh the UAS screen.

   - ☐ The UAS will report warm started success the console.

3. Attempt to switch a talk group to encrypted mode by selecting the talk group and selecting the private button.
   - ☐ The console will now allow you to encrypt the talkgroup because the console has the encryption keys.

4. PTT the console and the encrypted radios should hear the call.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

5.9 Single Site Group Test Call

Purpose: **The Group Test Call will show that the site will allow a radio to communicate using a group call**

Expected Results: **The test will demonstrate that all radios assigned to a common group will hear a call and all radios assigned to an uncommon group will not hear the call**

Setup: **Set Radios 1, 2, and 3 to (Group A) per test group structure. Make sure Scan is turned OFF. All radios should not be in encrypted mode but have encryption keys.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64001 P25	64001
Radio 3	998003	TG64001 P25	64001

Execution:

1. PTT Radio 1 and talk.
   - The transmit (TX) indicators should turn on at Radio 1.
   - Audio should be heard in Radios 2 and 3.
   - The ID of Radio 1 should be seen on Radios 2 and 3.
2. Set Radio 3 to (TG64002 P25). PTT on Radio 1 and talk.
3. The transmit (TX) indicators should turn on at Radio 1.
   - Audio should be heard in Radio 2 only.
   - The ID of Radio 1 should be seen at Radio 2 only.
4. Repeat sets 1-3 for encrypted mode

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

5.10 Single Site Individual (Private) Call

Purpose: **The Individual Call test will verify that the site will allow two radios to communicate on a private call**

Expected Results: **This test will demonstrate that two radios can communicate on an individual call and other radios will not hear the private conversation.**

Setup: **Set Radios 1, 2, and 3 to (TG64001) per test group structure. All radios should not be in encrypted mode but have encryption keys.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64001 P25	64001
Radio 3	998003	TG64001 P25	64001

Execution:

1. Using the Radio 1, select the pre-stored ID of Radio 2 or enter the Radio 2 ID directly from the keypad, and PTT Radio 1.

    - Verify that Radio 2 receives the call and displays the ID of Radio 1. Verify that Radio 3 remains idle.

2. Release the PTT on Radio 1 and immediately PTT on Radio 2.

    - Verify that Radio 1 receives the call and displays the ID of Radio 2.

    - Verify Radio 3 remains idle.

3. Using the Radio 1, select the pre-stored ID of Radio 3 or enter the Radio 3 ID directly from the keypad, and PTT Radio 1.

    - Verify that Radio 3 receives the call and displays the ID of Radio 1.

    - Verify that Radio 2 remains idle.

4. Release the PTT on Radio 1 but do not immediately PTT Radio 3.

    - Verify that Radio 3 gives a Call Back Alert (WHC-"Who Has Called") Indication.

5. Make a return call from Radio 3 back to Radio 1.

   - ☐ Verify that Radio 1 receives the call and displays the ID of Radio 3.
   - ☐ Verify Radio 2 remains idle.

6. Repeat steps 1-5 for encrypted mode.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

5.11 Multi-Site Encrypted Group Test Call

Purpose: **The Group Test Call will show that the site will allow a radio to communicate using a group call**

Expected Results: **The test will demonstrate that all radios assigned to a common group will hear a call and all radios assigned to an uncommon group will not hear the call**

Setup: **Set Radios 1, 2, and 3 to (Group A) per test group structure. Make sure Scan is turned OFF. All radios should not be in encrypted mode but have encryption keys.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64001 P25	64001
Radio 3	998003	TG64001 P25	64001

Execution:

1. PTT Radio 1 and talk.
   - The transmit (TX) indicators should turn on at Radio 1.
   - Audio should be heard in Radios 2 and 3.
   - The ID of Radio 1 should be seen on Radios 2 and 3.
2. Set Radio 3 to (TG64002 P25), PTT on Radio 1 and talk.
   - The transmit (TX) indicators should turn on at Radio 1.
   - Audio should be heard in Radio 2 only.
   - The ID of Radio 1 should be seen at Radio 2 only.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

5.12 Multi-site Encrypted Individual (Private) Call

Purpose: **The Individual Call test will verify that the site will allow two radios to communicate on a private call**

Expected Results: **This test will demonstrate that two radios can communicate on an individual call and other radios will not hear the private conversation.**

Setup: **Set Radios 1, 2, and 3 to (TG64001) per test group structure. All radios should not be in encrypted mode but have encryption keys.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64001 P25	64001
Radio 3	998003	TG64001 P25	64001

Execution:

1. Using the Radio 1, select the pre-stored ID of Radio 2 or enter the Radio 2 ID directly from the keypad, and PTT Radio 1.

   - ☐ Verify that Radio 2 receives the call and displays the ID of Radio 1.
   - ☐ Verify that Radio 3 remains idle.

2. Release the PTT on Radio 1 and immediately PTT on Radio 2.

   - ☐ Verify that Radio 1 receives the call and displays the ID of Radio 2.
   - ☐ Verify Radio 3 remains idle.

3. Using the Radio 1, select the pre-stored ID of Radio 3 or enter the Radio 3 ID directly from the keypad, and PTT Radio 1.

   - ☐ Verify that Radio 3 receives the call and displays the ID of Radio 1.
   - ☐ Verify that Radio 6 remains idle.

4. Release the PTT on Radio 1 but do not immediately PTT Radio 3.

- ☐ Verify that Radio 3 gives a Call Back Alert (WHC-"Who Has Called") Indication.
- ☐ Then make the return call from Radio 3 back to Radio 1.
- ☐ Verify that Radio 1 receives the call and displays the ID of Radio 3.
- ☐ Verify Radio 2 remains idle.

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

5.13 Encrypted Group Test

Purpose: **The Group Test Call will show that the site will allow a radio to communicate using a group call**

Expected Results: **The test will demonstrate that all radios assigned to a common group will hear a call and all radios assigned to an uncommon group will not hear the call**

Setup: **Set Radios 1, 2, and 3 to (Group A) per test group structure. Make sure Scan is turned OFF. All radios should not be in encrypted mode but have encryption keys.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64001 P25	64001
Radio 3	998003	TG64001 P25	64001

Execution:

1. PTT Radio 1 and talk.
   - The transmit (TX) indicators should turn on at Radio 1.
   - Audio should be heard in Radios 2 and 3.
   - The ID of Radio 1 should be seen on Radios 2 and 3.
2. Set Radio 3 to (TG64002 P25). PTT on Radio 1 and talk.
   - The transmit (TX) indicators should turn on at Radio 1.
   - Audio should be heard in Radio 2 only.
   - The ID of Radio 1 should be seen at Radio 2 only.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

5.14 Encrypted Individual (Private)

Purpose: **The Individual Call test will verify that the site will allow two radios to communicate on a private call**

Expected Results: **This test will demonstrate that two radios can communicate on an individual call and other radios will not hear the private conversation.**

Setup: **Set Radios 1, 2, and 3 to (TG64001) per test group structure. All radios should not be in encrypted mode but have encryption keys.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64001 P25	64001
Radio 3	998003	TG64001 P25	64001

Execution:

1. Using the Radio 1, select the pre-stored ID of Radio 2 or enter the Radio 2 ID directly from the keypad, and PTT Radio 1.
2. Verify that Radio 2 receives the call and displays the ID of Radio 1. Verify that Radio 3 remains idle.
3. Release the PTT on Radio 1 and immediately PTT on Radio 2.
4. Verify that Radio 1 receives the call and displays the ID of Radio 2. Verify Radio 3 remains idle.
5. Using the Radio 1, select the pre-stored ID of Radio 3 or enter the Radio 3 ID directly from the keypad, and PTT Radio 1.
6. Verify that Radio 3 receives the call and displays the ID of Radio 1. Verify that Radio 6 remains idle.
7. Release the PTT on Radio 1 but do not immediately PTT Radio 3. Verify that Radio 3 gives a Call Back Alert (WHC-“Who Has Called”) Indication. Then make the return call from Radio 3 back to Radio 1.
8. Verify that Radio 1 receives the call and displays the ID of Radio 3. Verify Radio 2 remains idle.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

5.15 Phase 2 DES

Purpose: **Confirms the operation of DES encryption for phase 2 voice calls.**

Expected Results: **The encrypted talk groups can communicate.**

Setup **Console 1 programmed with a DES encrypted phase 2 talk group and two radios programmed with the same DES Talk group and key, one radio with the group but no key and one radio with the DES group with a different key.**

Execution:

1. Place a call from one of the radios with the correct key on the DES group
   - ☐ Confirm that the call is heard on the other radio and the console
   - ☐ Confirm the call is not heard on the two radios that do not have the correct key.
2. Place a call on the DES group from the console
   - ☐ Confirm that the call is heard on the two radios with the correct key
   - ☐ Confirm the call is not heard on the two radios that do not have the correct key.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

6. ENCRYPTED DATA

6.1 Encrypted data on an unencrypted radio

Purpose: **Confirm that when the system is setup for encrypted data, the data communication leaves the system encrypted and cannot be read by a radio that does not have the encryption key.**

Expected Results: **The radio can't be pinged and the radio personality can't be read/programmed.**

Setup: **This test requires: section 'Unit Enable/Disable from the UAS' has been performed, radio 9880005 is enabled but not encrypted, needs to run from edata terminal, edata setup not set to best effort.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	9980001	TG64001 P25	64001
Radio 2	9980002	TG64001 P25	64001
Radio 5	9980005	TG64001 P25	64001

Execution:

1. From the edata terminal.
   - ☐ Verify that a host can't ping the radio.
   - ☐ Verify the radio personality can't be read.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

6.2 Unencrypted data With Encrypted Radio

Purpose: **Confirm when a radio does have the encryption key it can communicate with the Encrypted Data Terminal.**

Expected Results: **The radio can be pinged and the radio personality can be read/programmed.**

Setup: **This test requires: Radio 9880004 is enabled and encrypted, needs to run from edata terminal, edata setup not set to best effort.**

Radio 4 needs to be part of the "eData CryptoNet", and also have "keys" loaded.

Description	Radio LID	TG Description	TG ID
Radio 4	9980004	TG 64001 P25	64001

Execution:

1. From the edata terminal.
   - ☐ Verify that a host can ping the Radio 4.
   - ☐ Verify the radio personaility can be read.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

7. IN-CALL STATUS REPORTING

7.1 In-Call Location Reporting Radio

Purpose: **This test will demonstrate system ability to send location status from a radio.**

Expected Results: **The system will display the radio location, and the location will change when the radio moves.**

Setup: **The system needs to be setup using the 'In-Call Status Reporting Manual' and the CLTsim need to be set up using Appendix A. This test will not work unless the radio has GPS lock so this test may not work indoors.**

Execution:

1. Log into CLTsim and open two terminal windows
   a. In terminal windows 1 type './cltsim –ccltsim.cfg' do not close the window
   b. In terminal windows 2 type
   'cltcmd -1 10.128.1.209 –u 21225 –s –j ipv4.10.128.79.1@vida.local –n location –n userStatus

2. PTT radio 1 for at least 3 seconds

3. Terminal widow 1 will show the output of the GPS data.

   ☐ Check to make sure GPS data is displayed.

4. Move radio 1 about 50 feet and PTT again for 3 seconds

   ☐ Verify GPS Data changes.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

7.2 In-Call Status Reporting Radio

Purpose: **This test will demonstrate system ability to send status from a radio.**

Expected Results: **The system will display the status from a radio.**

Setup: **The system needs to be setup using the 'In-Call Status Reporting Manual' and the CLTsim need to be set up using Appendix A.**

Execution:

1. Use terminal windows from pervious test
   a. In terminal windows 2 type
      'cltcmd -1 10.128.1.209 –u 21225 –s –j vuid.99999.10.998.6401@harris.com –n groupAlert –n userStatus

2. PTT radio 1 for at least 3 seconds

3. Terminal widow 1 will show the status of radio 1.

   ☐ Check to make sure radio 1 status is 'Open'.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

7.3 In-Call Emergency Reporting Radio

Purpose: **This test will demonstrate system ability to send location status from a radio.**

Expected Results: **The system will display the radio emergency.**

Setup: **The system needs to be setup using the 'In-Call Status Reporting Manual' and the CLTsim need to be set up using Appendix A.**

Execution:

1. Use terminal windows from pervious test
   a. In terminal windows 2 type
      'cltcmd -1 10.128.1.209 –u 21225 –s –j vuid.99999.10.998.6401@harris.com –n groupAlert –n userStatus

2. Create emergency on Radio1.

   ☐ Check to make sure Emergency is displayed as '1'.

3. Clear emergency on Radio 1
   ☐ Check to make sure Emergency is changed to '0'

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

7.4 In-Call Location Reporting Be-On

Purpose: **This test will demonstrate system ability to send location status from a BeOn terminal.**

Expected Results: **The system will display the radio location, and the location will change when the radio moves.**

Setup: **The system needs to be setup using the 'In-Call Status Reporting Manual' and the CLTsim need to be set up using Appendix A. This test will not work unless the radio has GPS lock so this test may not work indoors.**

Execution:

1. Log into CLTsim and open two terminal windows
   a. In terminal windows 1 type './cltsim –ccltsim.cfg' do not close the window
   b. In terminal windows 2 type
   'cltcmd -1 10.128.1.209 –u 21225 –s –j ipv4.10.128.79.1@vida.local –n location –n userStatus

2. PTT radio 1 for at least 3 seconds

3. Terminal widow 1 will show the output of the GPS data.

   ☐ Check to make sure GPS data is displayed.

4. Move radio 1 about 50 feet and PTT again for 3 seconds

   ☐ Verify GPS Data changes.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

7.5 In-Call Status Reporting Be-On

Purpose: **This test will demonstrate system ability to send status from a radio.**

Expected Results: **The system will display the status from a radio.**

Setup: **The system needs to be setup using the 'In-Call Status Reporting Manual' and the CLTsim need to be set up using Appendix A.**

Execution:

1. Use terminal windows from pervious test
   a. In terminal windows 2 type
   'cltcmd -1 10.128.1.209 –u 21225 –s –j vuid.99999.10.998.6401@harris.com –n groupAlert –n userStatus

2. PTT radio 1 for at least 3 seconds

3. Terminal widow 1 will show the status of radio 1.

   ☐ Check to make sure radio 1 status is 'Open'.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

7.6 In-Call Emergency Reporting Be-On

Purpose: **This test will demonstrate system ability to send location status from a radio.**

Expected Results: **The system will display the radio emergency.**

Setup: **The system needs to be setup using the 'In-Call Status Reporting Manual' and the CLTsim need to be set up using Appendix A.**

Execution:

1. Use terminal windows from pervious test
   a. In terminal windows 2 type
   'cltcmd -1 10.128.1.209 –u 21225 –s –j vuid.99999.10.998.6401@harris.com –n groupAlert –n userStatus

2. Create emergency on Radio1.

   ☐ Check to make sure Emergency is displayed as '1'.

3. Clear emergency on Radio 1

   ☐ Check to make sure Emergency is changed to '0'

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

8. HIGH AVAIBILITY WIDE AREA ROUTER FAILURE

Purpose: **Demonstrate the capabilities of the system to work after a WAR failure**

Expected Results: **System components that are set-up with High Availability will continue to work after a WAR failure.**

Setup: **These tests are setup to be run twice, once on each router. So after completing step 4 restart the WAR router if not already running wait 20 minutes, and rerun the tests for the second router. These tests will simulate a WAR failure by disconnecting it from the Wide Area Network, so the WAR to WAN connection will need to be known.**

1. Use Radio 1 to initiate a call

   - Verify that the call is heard on the Radio 2. Keep the call active during fail-over.

2. Use Radio 3 to initiate a call

   - Verify that the call is heard on Radio 4. Keep the call active during fail-over.

3. Log in to s0u1nss and s0u2nss, and change your user to the root user by typing ‘su –‘ and entering the password.

4. Type ‘HArunning’ into both NSSs, one will report that it is the ‘Stand By’ and one will report that it is the ‘Primary’ log the information in the chart below.

	Name Of Primary NSS	Name of Primary WAR	Name of Primary RNM	Name of Primary RSM	Shutdown Time
Test 1					
Test 2					

5. Log into the ‘Primary’ WAR that is associated with the ‘Primary’ NSS. Shut off the connection to the WAN by performing a shut on the necessary ports.

   - The call from Radio 3 to Radio 4 will be dropped.

   - The call from radio 1 to 2 will continue and the console will lose connectivity to the VNIC.

- ☐ Verify that after a short delay, the Backup server NSS2 automatically takes over as the primary server.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

8.1 UAS Site Access Control for Invalid User ID

Purpose: **This test will demonstrate access control for Subscriber units with invalid radio IDs and High Availability of the RSM.**

Expected Results: **This test will deny a radio with an invalid Subscriber ID access to the system. Once the radio is added to the system the primary RSM will download it to the sites and allow the radio access. When the primary RSM is turned off and the radio is deleted from the UAS the secondary RSM will delete the radio from the system. Once the radio is deleted from the system the radio will again be denied access.**

Setup: **Use the table below to set up the new radio in the UAS**

Voice End User								
User Id	**Name**	**Description**	**Personality**	**User Privilege**	**Enable P25 AES OTAR**	**Manually-Keyed**	**P25 Voice Auth**	**Preferred Vocoder**
010:998:9150	Rad9150	Radio9150	Pers1	998_10_supervisor	FALSE	FALSE	FALSE	P25 Full Rate
OS Voice Auth	**Transc Allowed Flag**							
FALSE	TRUE							

Subscriber Unit							
Description	**RSI**	**Electronic Serial Number**	**Protocol Mask**	**Status**	**Sub Type**	**Assigned End User**	**Algorithm Support**
Radio9150	99899150	109989150	P25	Enabled Unit	Harris P5400	010:998:9105	AES

Execution:

1. Logging into a site traffic controller and type ‘show udb 109989150’
   - Verify the radio is not present in the traffic controller database
2. Program Radio 9801 with an ID 9989150.

3. Attempt to PTT Radio 9150.

   - ☐ Verify access to the site is denied and audio is not heard on Radio 2.
   - ☐ Verify the system is still functional by PTT Radio 2 and verify the audio is heard on Radio 3.

4. Use the supplied table to enter radio 109989150 in to the UAS database.
   a. Select Agency/"agency name"/Voice End User. Click Add Entry and then on the End User Detail screen input the User ID, password ("p25user"), Name, Description, etc. of the user. Click OK and download.

      - ☐ Verify the user ID has been added to the list of users\

   b. Select Agency/"agency name"/Subscriber Unit and enter the appropriate User ID, IP Address, and ESN for the user created in step 7. Click OK and download.

5. Loin into a site traffic controller issue a "show udb 109989150

   - ☐ Verify the radio is now present in the traffic controller database

6. Key radio 9150

   - ☐ Verify access to the site is permitted and audio is heard on radio.

7. Restart radio 9150 and PTT the radio

   - ☐ Verify access to the site is permitted and audio is heard on radio 9012.

8. Delete 10998999150 from the UAS database

9. Key radio 9150 from UAS

   - ☐ Verify access to the site is not permitted and audio is not heard.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

8.2 Site Activity using the Activity Warehouse

Purpose: **Demonstrate the capability to create various Agency level system usage reports.**

Expected Results: **This test will create an Agency level user reports.**

Setup: **Ensure radio traffic has occurred across the network recently. If necessary or desired, place some calls with a known radio ID on multisite talk groups prior to running the test for reference during the test.**

Execution:

1. Log into the SMT PC as a System level administrator.

2. Open Internet Explorer and browse to 'https://*s0u1pro.vida.local/*reports' and log in with active directory credentials.

3. Select Activity Reports → Call Activity
   a. enter the time period for the report (example: 2-hour window before this test).

4. Enter additional report information required.

5. Click on "View Report"
   - ☐ Check to make sure that there is call activity. These reports can be up to 2 hours behind.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

8.3 VIDA REGIONAL NETWORK MANAGER (RNM)

Purpose: **Demonstrate the capability to monitor real-time call activity from the RNM.**

Expected Results: **This test will show active call traffic on specific talk groups and SIDs.**

Setup: **Administrator access to the RNM.**

Execution:

1. On a client computer, open the windows Internet Explorer and browse to https://s0u1rnm.vida.local/nmc and log in with an Active Directory account.
2. Choose the system map and select the 'Launch Application' button.
3. Open the Realtime tab and Click Site Calls.
4. Select the site and expand.
5. Check the box next to the channels and select to add the channels to the target list. Select the 'ok' button to launch the application.
6. Place a group call from Radio 1 to Radio 2 on the site.
   - ☐ Verify that the event viewer displays the talkgroup ID and calling party ID.
   - ☐ Verify the state changes from Free to Talk.
   - ☐ Verify the TG Alias displays the Group Number.
7. Use Internet Explorer to browse to https://s0u2rnm.vida.local/nmc and repeat test steps 1-6 for the second RNM.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

8.4 Regional Network Manger Test

Purpose: **Demonstrate the capability to monitor system alerts from the RNM.**

Expected Results: **This test will show system level equipment icons.**

Setup: **Administrator access to the RNM.**

Execution:

1. On a client computer, open the windows Internet Explorer and browse to https://s0u1rnm.vida.local/nmc and log in with the active directory account.

2. Choose the system map and select the ‘Launch Application’ button. Select the ‘Network’ tab and expand the tree in the left hand panel until you can see a site in the right hand panel.

   - Verify the Infrastructure is presented.

   - Select an object and right click to select properties to view information related to the object.

3. Substitute https://s0u2rnm.vida.local/nmc and repeat test steps 1-3 for the second RNM.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

8.5 RF System Alarms Indications are reported to the RNM

Purpose: **Demonstrate the capability to monitor system faults & alarms at the RNM.**

Expected Results: **System level equipment will indicate faults & alarms at the RNM.**

Setup: **Access to the site under test and the regional RNM. The alarm will need to be generated by equipment being physically powered-down. Note the time of the alarm condition for later tests. Call up the RNM Domain screen and verify that all map icons are either green or blue. On the Fault Browser screen delete any prior alarms.**

Execution:

1. On a client computer, open the windows Internet Explorer and browse to https://s0u1rnm.vida.local/nmc and log in with an Active Directory account.

2. Choose the system map and select the 'Launch Application' button.

3. Select the 'Network' tab and expand the tree in the left hand panel until you can see a site in the right hand panel.

4. Generate an alarm on a device (see chart) by powering down or otherwise disabling the device.

   - ☐ Verify that the RNM indicates a site alarm for the affected device.

5. Turn the device back ON.

   - ☐ Verify that the device alarm clears and displays green.

6. Review alarm details by performing a Right Mouse Click on an Object. Select the desired menu option.

7. Repeat steps 1-4 for all equipment listed in the below chart.

8. Substitute https://s0u2rnm.vida.local/nmc and repeat test steps 1-5 for the second RNM.

Record the results below for each site. (Note: This form can be modified to reflect actual as-built alarms

Tester:		Results:	Date:	

Alarm #	Name	Pass/Fail	Remarks
1	Traffic Controller		
2	Router		
3	Switch		
4	Network Sentry		
5	MME		

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

8.6 Network Sentry Site Alarm Indications are reported to the RNM

Purpose: **Demonstrate the capability to monitor site faults & alarms at the RNM.**

Expected Results: **Site level equipment will indicate faults & alarms at the RNM.**

Setup: **This test verifies that the Site & Shelter Alarms are connected to the new system and alarm names are programmed to show the alarm types and locations. Site specific digital alarm inputs connected to the alarm management system (NetGuardian or Network Sentry) alarm unit.**

Execution:

1. On a client computer, open the windows Internet Explorer and browse to https://s0u1rnm.vida.local/nmc and log in with the Active Directory account.

2. Choose the system map and select the ‘Launch Application’ button.

3. Select the ‘Network’ tab and expand the tree in the left hand panel until you can see a site in the right hand panel.

4. Select a physical site to test alarm inputs.

5. Create a condition that will either simulate an alarm (jumper alarm contacts) or the actual event to trigger each alarm

   - Verify that the alarm is detected and displayed in the RNM Network Viewer and is listed in the Fault Browser

6. Clear the alarm condition

   - Observe that the alarm indication has cleared in both the Network Viewer and the Fault Browser

7. Repeat for each alarm and for each site in the system

8. Record the results below for each site. (Note; This form can be modified to reflect actual as-built alarms).

Site #:			Site Name	
Tester:		Results:	Date:	
Alarm #	Name	Pass/Fail	Remarks	
1	Door			
2	Smoke Detector			
3	Heat Detector			
4	Building Low Temp			
5	Building High Temp			
6	Main Power Fail			
7	ATS Normal			
8	ATS Emergency			
9	Generator Low Oil			
10	Generator Over Temp			
11	Generator Over Crank			
12	ACH1 L.O.			
13	ACH2 L.O.			
14	Surge Arrestor 1			
15	Surge Arrestor 2			
16	Multicoupler Top			
17	Multicoupler Bottom			

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

9. CONTROL POINT MOVEMENT

9.1 DCP Forced Control Point Movement

Purpose: **This test will demonstrate the DCP system can move the control point in response to user command.**

Expected Results: **This test will verify that the Control Point can be moved from the active site to an alternate Control Point Site. After the control point is switched to the alternate Control Point the system should operate normally.**

Setup: **The DCP system is operating with an active control point and at least two sites are enabled to be the control point.**

Execution:

1. Log into the RNM
2. In Network view identify the site which is the active control point.
3. Right click on the control point site icon and select ‘Change Control Point to Best Site Available” .
4. Verify system is still functioning (i.e. voice calls can be made – between radios and a radio and console and optionally data calls can be made (e.g. radios can be ‘pinged’) .
5. Verify that the RNM indicates a different site as control point and the previous control point is now a TX site. (note – a CP only site displays “zzzz” when it is not the active control point.)
6. On the RNM right click on the previous control point site and select “Change to be the Control Point”.
7. Verify system is still functioning (i.e. calls can be made – between radios and a radio and console and optionally data calls can be made (e.g. radios can be ‘pinged’). .
8. Verify that the RNM indicates the control point has moved to the site selected in step 6 and the previous control point is now a TX site. (note – a CP only site displays “zzzz” when it is not the active control point.)

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

9.2 DCPControl Point Movement in response to Faults at the Active Control Point

Purpose: **This test will demonstrate that the Control Point will move in response to failures at the active Control Point.**

Expected Results: **This test will verify that the DCP system will move the active Control Point to an alternate control point site when the active control point experiences failures. After the Control Point moves the old control point should drop into bypass and the rest of the system should operate normally as a Simulcast cluster.**

Setup: **The DCP system is operating with an active control point and is properly configured with at least two sites enabled to be the control point.**

Execution:

1. Verify system is functioning (i.e. calls can be made – between radios and a radio and console and optionally data calls can be made (e.g. radios can be 'pinged').

2. At the control point site disconnect the 1pps cable from GPS B.

3. Verify the system is still functioning (i.e. calls can be made – between radios and a radio and console and optionally data calls can be made (e.g. radios can be 'pinged') and control point has not moved. The traffic controllers at the control point display 'CC xx' and 'TC xx' when idle; at a satellite site the traffic controllers display "TR xx' where xx is the channel number.(>

4. At the control point site disconnect the 1pps cable from GPS A.

5. Verify that the control point moved to next ranked site and the old control point is now in bypass. The traffic controllers at the control point display 'CC xx' and 'TC xx' when idle: Any channels that are configured to be active at the old control point site when it is in bypass will have all their status LED red. In bypass all the traffic controllers display 'CC xx' and 'TC xx' when idle and the status LED will be red.

6. Verify the RNM indicates the new control point and shows the old control point site is now in bypass.

7. Verify the simulcast system is still functioning (i.e. calls can be made – between radios and a radio and console and optionally data calls can be made (e.g. radios can be 'pinged'). .

8. If the old control point has channels active in bypass verify radios switched to this bypass site acquire the control channel and can communicate. (note – this step could be skipped; the bypass tests in sections 20.x will do this) >

9. Restore the connections to the GPS receivers at the site in bypass (the old control point site).

10. Verify that the site exits bypass and joins the simulcast cluster.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

10. P25 TRUNKED CALLS AND SITE FEATURES

Purpose: **These tests will verify that the site can provide radio communications at the site level.**

Expected Results: **These tests will demonstrate that the site can provide communications for radios.**

Setup: **All tests in this section assume that the UAS setup matches the configuration in this test. All testing in this section is to be done with phase 1 radios.**

10.1 Transmit Grant Tone

Purpose: **Demonstrate the system channel grant tone is heard on the radio.**

Expected Results: **This test will show that the radio will play a grant tone when the radio is assigned a working channel.**

Setup: **One radio with valid ID and a valid group on selected system. Grant tone (Ready to Talk tone) enabled in radio personality as applicable for specific radio type being tested.**

Execution:

1. Press PTT button on radio with valid group selected.

2. Verify grant tone is heard at radio when working channel access is granted.

Note: If the call is queued, the grant tone will be delayed until the call is assigned a working channel.

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

10.2 Transmission Trunking

Purpose: **This test will demonstrate that the System is working as a Transmission Trunking system.**

Expected Results: **The tests verify that the Control Channel will assign a working channel to the radio and that the radio and site will work as a trunking set.**

Setup: **Radios 1, 2, and 3 should be the only radios on the system.**

Monitor System channel assignment in RSM Site Activity Real-Time Viewer.

All Radios are registered on Site 1.

Description	Radio LID	TG Description	TG ID
Radio 1	9980001	TG 64001 P25	64001
Radio 2	9980002	TG 64001 P25	64001
Radio 3	9980003	TG 64001 P25	64001

Execution:

1. Log into RNM and start RSM Site Activity application in the real time viewer. Observe all channels on Site 1.
2. PTT Radio 1 and talk.
   - The transmit (TX) indicators should turn on at Radio 1.
   - Verify the number of the channel assigned.
3. PTT Radio 2 and talk.
   - The transmit (TX) indicators should turn on at Radio 2.
   - Verify the next channel is assigned.
4. PTT Radio 3 and talk.
   - The transmit (TX) indicators should turn on at Radio 3.
   - Verify the next channel is assigned.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

10.3 Message Trunking on Phase 1

Purpose: **This test will demonstrate that the system, for FMDA Phase 1 group calls, operates as Enhanced Message Trunking for Group Calls.**

Expected Results: **Verify that the system will assign the same working channel to a Message Trunking call if the next call happens within the Message Trunking hang time. During the hang time, the transmitting radio will return to the Control Channel for Phase 1 Group Calls.**

Setup: **Radios 1, 2, and 3 should be the only radios on the system. Each call needs to happen within 3 seconds of each other for this test to work.**
TG 64301 is a FDMA (Phase 1) MT Group.

Monitor System channel assignment in RSM Site Activity Real-time viewer.

Description	Radio LID	TG Description	TG ID	Site
Radio 1	9980001	TG 64301 P25	64301	1
Radio 2	9980002	TG 64301 P25	64301	1
Radio 3	9980003	TG 64301 P25	64301	1

Execution:

1. Log into RNM and start RSM Site Activity application in the real time viewer. Observe all channels on Site 1 for each of the steps below.

2. PTT Radio 1 and talk.
   - ☐ The transmit (TX) indicators (red light) should turn on at Radio 1.
   - ☐ On the RNM, observe the number of the channel assigned.
   - ☐ Verify audio from Radio 1 is heard at Radio 2 and Radio 3.

3. Un-PTT Radio 1.
   - ☐ Verify Radio 1's LED light turns off, no color, to indicate Radio 1 is on the Control Channel (CC), during the Hang Time. (This is Enhanced Message Trunking for FDMA).

4. PTT Radio 2, within the 3 second hang time, and talk.
   - ☐ The transmit (TX) indicators (red light) should turn on at Radio 2.
   - ☐ Verify the same channel is assigned, as in step 2.
   - ☐ Verify audio from Radio 2 is heard at Radio 1 and Radio 3.

5. Un-PTT Radio 2.
   - ☐ Verify Radio 2's LED light turns off, no color, to indicate Radio 2 is on the Control Channel (CC), during the Hang Time.

6. PTT Radio 3, within the 3 second hang time, and talk.
   - ☐ The transmit (TX) indicators (red light) should turn on at Radio 3.
   - ☐ Verify the same channel is assigned as in steps 2, & 4.
   - ☐ Verify audio from Radio 3 is heard at Radio 1 and Radio 2.

7. Un-PTT Radio 3
   - ☐ Verify Radio 3's LED light turns off, no color, to indicate Radio 3 is on the Control Channel (CC), during the Hang Time.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

10.4 Message Trunking on Phase 2

Purpose: **Demonstrate the system, for TDMA Phase 2 group calls, operates as Standard Message Trunking for Group Calls.**

Expected Results: **System will assign the same working channel to a Message Trunked call, if the next call happens within the Message Trunked hang time. During the hang time, the transmitting radio will remain on the Traffic (Working) Channel for Phase 2 Group Calls.**

Setup: **TDMA Enabled Radios 1, 2, and 3 should be the only radios on the system. Each call needs to happen within 3 seconds of each other for this test to work. TG 64353 is a TDMA (Phase 2) MT Group**

Monitor System channel assignment in RSM Site Activity Real-time Viewer.

Description	Radio LID	TG Description	TG ID	Site
Radio 1	9980001	TG 64353 P25	64353	1
Radio 2	9980002	TG 64353 P25	64353	1
Radio 3	9980003	TG 64353 P25	64353	1

Execution:

1. Log into RNM and start RSM Site Activity application in the real time viewer. Observe all channels on Site 1 for each of the steps below.

2. PTT Radio 1 and talk.
   - ☐ The transmit (TX) indicators (red light) should turn on at Radio 1.
   - ☐ On the RNM, observe the number of the channel assigned and the channel slot assigned.
   - ☐ Verify audio from Radio 1 is heard at Radios 2 and 3.

3. Un-PTT Radio 1
   - ☐ Verify Radio 1's LED Receive (RX) indicator turns green, to indicate Radio 1 remains on the Traffic (Working) channel, during the Hang Time.

4. PTT Radio 2, within the 3 second hang time, and talk.
   - ☐ The transmit (TX) indicators (red light) should turn on at Radio 2.
   - ☐ Verify the same channel / slot is assigned, as in step 2.
   - ☐ Verify audio from Radio 2 is heard at Radios 1 and 3.

5. Un-PTT Radio 2
   - ☐ Verify Radio 2's LED light turns green, to indicate Receive (Rx). Indicates Radio 2 remains on the Traffic (Working) channel, during the Hang Time.

6. PTT Radio 3, within the 3 second hang time, and talk.
   - ☐ The transmit (TX) indicators (red light) should turn on at Radio 3.
   - ☐ Verify the same channel / slot is assigned in steps 2 & 4.
   - ☐ Verify audio from Radio 3 is heard at Radios 1 and 2.

7. Un-PTT Radio 3
   - ☐ Verify Radio 3's LED light turns green, to indicate Receive (Rx). Indicates Radio 3 remains on the Traffic (Working) channel, during the Hang Time.

- ☐ After the hang time expires, verify Radio 3's LED light turns off.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

10.5 Group Test Call

Purpose: **The Group Test Call will show that the site will allow a radio to communicate using a group call.**

Expected Results: **The test will demonstrate that all radios assigned to a common group will hear a call and all radios assigned to an uncommon group will not hear the call.**

Setup: **Set Radios 1, 2, and 3 to (Group A) per test group structure. Make sure Scan is turned OFF.**

Description	Radio LID	TG Description	TG ID
Radio 1	9980001	TG 64001 P25	64001
Radio 2	9980002	TG 64001 P25	64001
Radio 3	9980003	TG 64001 P25	64001

Execution:

1. PTT Radio 1 and talk.
   - ☐ The transmit (TX) indicators should turn on at Radio 1.
   - ☐ Audio should be heard in Radios 2 and 3.
   - ☐ The ID of Radio 1 should be seen on Radios 2 and 3.

2. Set Radio 3 to (TG64002 P25). PTT on Radio 1 and talk.
   - ☐ The transmit (TX) indicators should turn on at Radio 1.
   - ☐ Audio should be heard in Radio 2 only.
   - ☐ The ID of Radio 1 should be seen at Radio 2 only.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

10.6 Individual (Private) Call

Purpose: **The Individual Call test will verify that the site will allow two radios to communicate on a private call**

Expected Results: **This test will demonstrate that two radios can communicate on an individual call and other radios will not hear the private conversation.**

Setup: **Set Radios 1, 2, and 3 to (TG64001) per test group structure.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64001 P25	64001
Radio 3	998003	TG64001 P25	64001

Execution:

1. Using the Radio 1, select the pre-stored ID of Radio 2 or enter the Radio 2 ID directly from the keypad, and PTT Radio 1.

   - ☐ Verify that Radio 2 receives the call and displays the ID of Radio 1.
   - ☐ Verify that Radio 3 remains idle.

2. Release the PTT on Radio 1 and immediately PTT on Radio 2.

   - ☐ Verify that Radio 1 receives the call and displays the ID of Radio 2.
   - ☐ Verify Radio 3 remains idle.

3. Using the Radio 1, select the pre-stored ID of Radio 3 or enter the Radio 3 ID directly from the keypad, and PTT Radio 1.

   - ☐ Verify that Radio 3 receives the call and displays the ID of Radio 1.
   - ☐ Verify that Radio 2 remains idle.

4. Release the PTT on Radio 1 but do not immediately PTT Radio 3.

   - ☐ Verify that Radio 3 gives a Call Back Alert (WHC-"Who Has Called") Indication.

5. Make the return call from Radio 3 back to Radio 1.

   - ☐ Verify that Radio 1 receives the call and displays the ID of Radio 3.

- ☐ Verify Radio 2 remains idle.

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

10.7 Unit to Unit Call Alert Paging

Purpose: **To demonstrate that a radio can send a page to a different radio on the system.**

Expected Results: **This test will verify that radio 1 can send a page to radio 2**

Setup: **Radio 1 with Call Alert programmed into a button (“PAGE”) and Radio 2’s ID programmed into its Individual Call list. Radio 1 and Radio 2 on the same site.**

Execution:

1. Select the PAGE function from the MENU on Radio 1. Select Radio 2 from the preprogrammed list of radios and PTT Radio 1.

   - ☐ Verify Radio 1 displays “*TX PAGE” on the second line.
   - ☐ Verify Radio 2 displays the ID of Radio 1 on its first line and “*RX PAGE” on the second line.
   - ☐ Verify Radio 2 beeps multiple times to indicate a received page.
   - ☐ Verify Radio 1 beeps multiple times to indicate the page was successfully sent.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

10.8 Multi-site Announcement Group Call

Purpose: **This test will demonstrate that the system will allow a group call to function in a multi-site environment**

Expected Results: **The test will demonstrate that all radios assigned to a common group will hear a call, even though some of the radios are at distant sites and all radios assigned to an uncommon group will not hear the call**

Setup: **Groups 64101 and 64102 are in Announcement Group 64107 per test group structure. Ensure Scan is turned OFF.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64002 P25	64002
Radio 3	998002	TG64003 P25	64003

Execution:

1. PTT Radio 1 and talk.
2. The transmit (TX) indicators should turn on at Radio 1.
   - ☐ Audio should be heard on Radios 2 and 3.
   - ☐ ANNOUNCE should be displayed on Radios 2 and 3.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

10.9 Multisite Emergency Group Call

Purpose: **Demonstrate the capability of the system to process an emergency group call.**

Expected Results: **This test will verify that when a radio indicates an emergency group call. All other radios in the group indicate an emergency and the emergency can be cleared by an administrator radio.**

Setup: **Program 3 Radios with the same emergency home group. Set the supervisor (Radio 1) & Radio 2 to the home group. Set Radio 3 to a different group (not home group). A console will be used to clear the emergency.**

Description	Radio LID	TG Description	TG ID	Site
Radio 1	9980001	TG 64001 P25	64001	1
Radio 2	9980002	TG 64001 P25	64001	2
Radio 3	9980003	TG 64003 P25	64003	1

Execution:

1. Press the Emergency call button on Radio 1 and talk within the pre-defined Emergency Auto-key time, and/or PTT Radio 1 during or just after that time.

   - ☐ Verify that Radio 1 indicates the “TX EMER” declaration and that it reverts to the home group.
   - ☐ Verify that Radio 1 (on Site 1) and Radio 2 (on Site 2) indicate a “RX EMER” and hear audio on the emergency home group.
   - ☐ Verify Radio 3 does not display the emergency.

2. Clear the emergency with the Console.

   - ☐ Verify the emergency clears in the radios.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

10.10 System All Call

Purpose: **Demonstrate the capability of the system to route a call to all radios on the system.**

Expected Results: **This test will demonstrate the system's ability to route a single call to all available radios on the system.**

Setup: **Note: If want to create demand for a Full Rate All Call, then one radio must be on the Full Rate All Call.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	9980001	TG64000 P25	64000
Radio 2	9980002	TG64001 P25	64001
Radio 3	9980003	TG64002 P25	64002

Execution:

1. With Radio 1 place an Individual call to talk group 64000 (All Call Talk Group)

   - Audio should be heard at Radios 2 and 3.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

10.11 Transmit Denied (for Invalid radio ID)

Purpose: **This test is set up to demonstrate that a radio can be denied transmission on a site**

Expected Results: **This test will verify the systems ability to deny a radio to transmit on one site and allow the radio to work on a different site.**

Setup: **Program system so that radio ID is not valid on the site under test. Download database to site.**

Execution:

1. Program Radio 1 with an invalid ID
2. PTT Radio 1
   - Verify the radio is prohibited access to system.
3. Reprogram the radio to the original personality.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

10.12 Single Site Call Queue Declaration Alert

Purpose: **This test will demonstrate the system queuing.**

Expected Results: **This test will verify that the system will assign users in a queue when the system has no available channels and assign users a working channel when the system has an available channel.**

Setup: **This test requires four radios and two working channels. Disable channels (if necessary) until there are two working channels at the site. This test is to be run with no other users on the system.**

Description	Radio LID	TG Description	TG ID
Radio 1	9980001	TG 64001 P25	64001
Radio 2	9980002	TG 64002 P25	64002
Radio 3	9980003	TG 64003 P25	64003
Radio 4	9980004	TG 64003 P25	64003

Execution:

1. Busy up all talk paths on the system with radio 1, and 2 by pressing and holding the PTT button.
2. With all talk paths busied, momentarily press and release the PTT button on test Radio 3
   - Verify that a Call Queued tone is heard at the radio.
3. Unkey (release PTT button) radio 2.
   - Verify that Radio 3 is assigned to the free talk path.
4. The grant tone is heard at the radio, without having to rekey the radio (repressing the PTT button).
5. Press the PTT button on Radio 3 within the auto key time applicable to the radio type (approx. 2 seconds) to keep the assigned channel.
   - Verify that audio from Radio 3 is heard at Radio 4.
6. Unkey all radios.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

10.13 Recent User Priority

Purpose: **Demonstrate system's ability to prioritize recent users in queueing situations.**

Expected Results: **When radios of the same priority level enter the queue, one that has been recently active will exit the queue first.**

Setup: **This test requires four radios and two working channels.**

Disable channels (if necessary) until there are two working channels at the site. Set the radio according to the table below. This test is to be run with no other users on the system and at intervals as set in the Recent Caller Interval (a time of greater than 10 seconds is recommended for the test which is configurable in the Traffic Controller module). This will only work if preformed quickly.

Description	Radio LID	TG Description	TG ID
Radio 1	9980001	TG 64001 P25	64001
Radio 2	9980002	TG 64002 P25	64002
Radio 3	9980003	TG 64003 P25	64003
Radio 4	9980004	TG 64004 P25	64004

Execution:

1. PTT and release Radio 1 (establish a recent user entry).
2. PTT Radios 3 and 4 and hold on transmit to busy both working channels.
3. PTT and release Radio 2 (queue a call less recent than Radio 1).
4. PTT and release Radio 1 (queue the recent user).
5. Unkey Radio 4
   - Verify that Radio 1 un-queues and transmits.
6. Unkey all radios.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

10.14 Call Priority for Group IDs

Purpose: **This test is set up to demonstrate the system's ability to allow a user with a higher priority to get assigned a channel before a user with a lower priority despite who enter the queue first.**

Expected Results: **This test will verify that a user that has a higher priority will get assigned a channel before users with a lower priority regardless of who entered the queue first. In this test radio 4 should get the first available channel, because it has a higher priority, and radio 3 will get assigned a channel next because it has a lower priority.**

Setup: **This test requires two working channels on the site. Disable channels (if necessary) until there are two working channels on the site. Setup the radio according to the table below. This test is to be run with no other users on the system.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	9980001	TG64001 P25	64001
Radio 2	9980002	TG64002 P25	64002
Radio 3	9980003	TG64004 P25	64003
Radio 4	9980004	TG64003 P25	64004

Execution:

1. PTT Radios 2 and 4 and hold on transmit to busy both working channels.
2. PTT and release Radio 1 (medium priority entry into the queue).
3. PTT and release Radio 3 (high priority entry into the queue).
4. Un-key Radio 4
   - Verify that Radio 3 un-queues and keys.
5. Un-key Radio 2
   - Verify that Radio 1 un-queues and keys.
6. Un-key all radios.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

10.15 Emergency Call Priority for Group IDs In Phase 1

Purpose: **Demonstrate the system's ability to allow a user with a higher priority to get assigned a channel before a user with a lower priority, despite who enters the queue first.**

Expected Results: **This test will verify that a user who has a higher priority will get assigned a channel before users with a lower priority regardless of who entered the queue first. In this test radio 4 should get the first available channel, because it has a higher priority, and radio 3 will get assigned a channel next because it has a lower priority.**

Setup: **This test requires two working channels on the site. Disable channels (if necessary) until there are two working channels on the site. Setup the radio according to the table below. This test is to be run with no other users on the system.**

Description	Radio LID	TG Description	TG ID
Radio 1	9980001	TG 64001 P25	64001
Radio 2	9980002	TG 64002 P25	64002
Radio 3	9980003	TG 64003 P25	64003
Radio 4	9980004	TG 64004 P25	64004

Execution:

1. PTT Radios 4 and 3 and hold on transmit to busy both working channels.
2. PTT and release Radio 2 (high priority entry into the queue).
3. Declare an emergency on Radio 1 (medium priority entry into the queue but now at Emergency Priority).
4. Un-key Radio 4
   - Verify that Radio 1 un-queues and is assigned a channel without having to PTT. (Key the radio within the specified auto key time in order to keep the channel.)
5. Un-key all radios and clear the emergency with the Radio 1.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

10.16 Group Scan

Purpose: **Verify when scan is enabled, calls from groups in the radio's scan list are received.**

Expected Results: **In this test the radio will play calls from multiple talk groups while scan is enabled**

Setup: **All radios for this test need to have scan ability.**

Radio 1 set up with TG64001 P25 and TG64002 P25 in the scan list, TG64001 P25 selected, and Group scan initially disabled.

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64002 P25	64001

Execution:

1. Place a call from Radio 2 on talk TG64001 P25.
   - ☐ Verify the call is received and audio is heard on Radio 1.
2. Place a call from Radio 2 on talk TG64002 P25.
   - ☐ Verify the call is not received by Radio 1.
3. Enable group scan on Radio 1.
4. Place another call from Radio 2 on talk TG64002 P25.
   - ☐ Verify that the call is now received and audio is heard on Radio 1.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

10.17 Priority Scan

Purpose: **Demonstrate groups assigned a higher priority in the scan list override groups of a lower priority.**

Expected Results: **Radio will play calls with a higher level of priority.**

Setup: Set Radio 1 to priority scan TG64001 P25, and scan (at lower priority – 3 bars) TG64002 P25. Set Radio 1 to TG64003. Have scan enabled on Radio 1.

Description	Radio LID	TG Description	TG ID
Radio 1 (SCAN)	9980001	TG 64003 P25	64003
Radio 2	9980002	TG 64002 P25	64002
Radio 3	9980003	TG 64001 P25	64001

Execution:

1. Have Radio 1 selected to TG64003 P25. Place a call from Radio 2 on TG64002 P25.
   - ☐ Verify Radio 1 scans to TG64002 P25 and hears audio from Radio 2. Continue transmitting from Radio 2.

2. Place a call from Radio 3 on TG64001 P25. [Radio 2 is still transmitting on TG64002 P25.]
   - ☐ Verify Radio 1 priority scans to TG64001 P25 and hears audio from Radio 3.

3. Unkey all radios, and turn off scan.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

10.18 Transmit Busy Lockout

Purpose: **Demonstrate a radio cannot key on a group, on which a group call is already active.**

Expected Results: **A radio will not be allowed to transmit on a talk group while a different radio is transmitting on the same talk group.**

Setup: **Talk group used for test must be set up as Transmission Trunked. This feature does not apply to Message Trunked calls.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64001 P25	64001

.

Execution:

1. Place a call from Radio 1 on selected talk group by pressing and holding the PTT button.

   ☐ Verify the call is received and audio is heard on Radio 2.

2. While the call is in progress, press the PTT button on Radio 2.

   ☐ Verify that Radio 2 does not transmit over (step on) the call in progress. (A double bump busy sound will be heard).

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

10.19 Continuous Control Channel Update

Purpose: **This test will demonstrate that a radio will join a call that is already in progress**

Expected Results: **This test will verify that a radio will join a call that is already in progress.**

Setup:

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64001 P25	64001

Execution:

1. Set both radios to the test group.
2. Turn radio 2 OFF.
3. Key radio 1 and hold. Turn ON the radio 2 (and set it to the test group if necessary).
   - ☐ Verify that the second radio joins the call in progress and hears audio from the call in progress.
4. Unkey radio 1.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

10.20 Convert Too Callee

Purpose: **Demonstrate when radios are simultaneously keyed, only one radio is given talk privilege.**

Expected Results: **When two radios on the same talkgroup are keyed simultaneously, only one radio will receive access to the working channel. The other radio will play the audio from the first.**

Setup: **Test of single site simultaneous call arbitration.**
Radio 1 and Radio 2 are registered on the same site and TG.

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64001 P25	64001

Execution:

1. Set two radios to the same site and group.
2. Key both radios at the same time.
   - ☐ Verify that one radio ends up transmitting and the other ends up receiving.
   - ☐ Verify that the call audio is routed and received by one of the units even though the PTT is pressed.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

10.21 Multi-site Routing (for Multi-site Logout)

Purpose: **Demonstrate the system will not route a call to a site if all the radios logged into the site have moved to a different site.**

Expected Results: **When the radio moves away from a site, the system will not route calls to the site that it has roamed away from.**

Setup: **Site 1 and 2 should be selected such that Radio 2 can log into Site 1 and then Site 2. If coverage prevents this, then program a third radio with the ID of Radio 2. Use the third radio to key on Site 1 with the ID of Radio 2 whenever the test procedure calls for this. The primary objective of this test is to demonstrate that the system routes calls to Site 2 whenever a unit (i.e. radio 2) is logged onto Site 2 and does not route calls to Site 2 when no units are logged into Site 2. Radio 1 logged in to Site 1 and Radio 2 logged into Site 2.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG641001 P25	64001
Radio 2	998002	TG641001 P25	64001

Execution:

1. Key Radio 1 on Site 1.
   - ☐ Verify channel assignments occur on Site 2. Un-key radio.
2. Switch Radio 2 to site 1.
3. Key Radio 1 on site 1.
   - ☐ Verify no channel assignment on site 2

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

10.22 Site Trunking (Failsoft) Indication

Purpose: **Demonstrate that radio displays a Failsoft Icon, when the site is unable to communicate with the system/network.**

Expected Results: **This test will verify that the radio will display an 'F' when the site it is logged into is not connected to the system.**

Setup: **Radios must be programmed to display Failsoft.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID	Site #
Radio 1	998001	TG641001 P25	64001	1
Radio 2	998002	TG641001 P25	64001	1
Radio 3	998003	TG641001 P25	64001	2

Execution:

1. PTT Radio 1

   ☐ Verify that the Radio 1, Radio 2, and Radio 3 can communicate on the system.

2. Disconnect the network connection from the Network Switching Center to the Site Router, causing loss of communication from the site back to the Network Switching Center.

   ☐ Verify that Radio 1 and Radio 2 indicate a Failsoft alarm ("F") on their displays this may take several minutes.

3. PTT Radio 1 on Talkgroup A. Verify audio is heard at Radio 2. Verify audio is not heard on Radio 3.

4. Re-connect the network from the Network Switching Center to the Site Router.

   ☐ Verify the Failsoft alarm disappears on the radios and that communications with Radio 3 is reestablished.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

10.23 Unconfirmed Call (Multisite Late-Enter)

Purpose: **Verify a radio will late enter an ongoing group call made from another site.**

Expected Results: **A radio creates demand for talkgroups even when no channels are available at a site. Ongoing calls on a talkgroup will be joined as channel resources become available.**

Setup: **Site 1 should only have one working channel, disable all other working channels at site 1.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID	Site #
Radio 1	998001	TG64001 P25	64001	1
Radio 2	998002	TG64002 P25	64002	1
Radio 3	998003	TG64001 P25	64001	2
Radio 4	998004	TG64001 P25	64001	2

Execution:

1. Key up radio 2 on site 1, and hold the call up.

2. Key up Radio 3 on TG64001 on Site 2, and hold the call up.
   - ☐ Verify that Radio 3 should get the grant tone and the call should go through to Radio 4 on Site 2.
   - ☐ Since Site 1 has no channels available, the call should not go through to Radio 1 on Site 1.

3. While Radio 2 is still keyed up, free up a channel on Site 1 by unkeying radio 2.
   - ☐ Verify that the call gets routed to Site 1 and that Radio 1 late-enters into the call on that site.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

10.24 Confirmed Call [Non Single Cell Simulcast/Multisite Only]

Purpose: **This test will demonstrate that the system will allow confirmed calls.**

Expected Results: **When a radio attempts PTT it will get a wait tone until there are available channels at all site that have demand for the call, or the confirmed call timer expires.**

Setup: **Additional radios maybe required for this test, this test requires two more radios than the number of channels available at the site to be tested.**

Site 1 should only have one working channel, disable all other working channels at site 1.

Radio Description	Radio Lid	Talk Group Description	Talk Group ID	Site #
Radio 1	998001	TG64001 P25	64101	1
Radio 2	998002	TG64002 P25	64002	1
Radio 3	998003	TG64001 P25	64101	2
Radio 4	998004	TG64001 P25	64101	2

Execution:

1. Key up Radio 2 on site 1, and hold the call up.
2. Key up Radio 3 on TG64001 on Site 2, and hold the call up.
   - ☐ The call will not be granted because there are no available channels on site 1.
3. Hold the call up until the confirmed call timer expires.
   - ☐ Once the timer expires the call will go through but only to site 2 only
4. While Radio 2 is still keyed up, free up a channel on Site 1 by unkeying radio 2.
   - ☐ Verify that the call gets routed to Site 1 and that Radio 1 late-enters into the call.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

10.25 Roaming (ProRoam) [This needs work before Final] [Field Only Test] [Non Single Cell Simulcast/Multisite Only]

Purpose: **This test will demonstrate the system ability to direct the radios to adjacent sites Control Channels.**

Expected Results: **As the signal quality degrades the radio will scan the adjacent Control Channels and log on to adjacent available Control Channel.**

Setup: **The two radios used for this test must be capable (feature encrypted) and programmed for ProRoam. The radios must be valid on the two sites (Site 1 and Site 2) being used to conduct the tests. Site 1 and Site 2 should have overlapping coverage to verify Priority System Scan (if tested). Verify that the Tone Suppress Option is not selected in the personality so that an audible tone can be heard once the radios switch systems. Program both radios for Dynamic Scan mode. To test Priority System Scan (a.k.a., Preferred Site), ensure only Radio 1 has one of the sites (Site 1) used for the test as its Priority System. Have Radio 2's Priority System Scan site set to a site not near the sites used in this test (i.e., not Site 1 or Site 2). Note that the display and indications of each model of radio differ. This test describes the general procedure for ProRoam Roaming. Refer to the specific radio operator's manual or the ProRoam Release Notes for details. Log Radio 1 and Radio 2 onto the Site 1 used for this test. Ensure the radios are communicating on this system.**

Execution:

1. Start with both radios at site 1.
2. Begin traveling toward an area where the coverage from Site 2 is stronger than the coverage from Site 1.
3. As you travel away from site 1 and towards site 2, the signal quality will deteriorate. Once the signal level of Site 2 exceeds the programmed ProRoam parameters in the personality
   - Radio 1 and Radio 2 will switch to the Site 2.
   - The radios will generate audible tones and will visually indicate that they have switched to Site 2 Cell.
   - After the radios have both switched to the Site 2 Cell, verify communications continue.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

10.26 Priority System Scan (Preferred Site) [Field Only Test] [Non Single Cell Simulcast/Multisite Only]

Purpose: **This test will demonstrate the radios ability to prefer one site over another site.**

Expected Results: **As the signal degrades the radio will switch to the preferred site even though the signal strength of the preferred site is lower than the non-preferred site.**

Setup: **The two radios used for this test must be capable (feature encrypted) and programmed for ProRoam. The radios must be valid on the two sites (Site 1 and Site 2) being used to conduct the tests. Site 1 and Site 2 should have overlapping coverage to verify Priority System Scan (if tested). Verify that the Tone Suppress Option is not selected in the personality so that an audible tone can be heard once the radios switch systems. Program both radios for Dynamic Scan mode. Static works. To test Priority System Scan (a.k.a., Preferred Site), ensure only Radio 1 has one of the sites (Site 1) used for the test as its Priority System. Have Radio 2's Priority System Scan site set to a site not near the sites used in this test (i.e., not Site 1 or Site 2). Note that the display and indications of each model of radio differ. This test describes the general procedure for ProRoam Roaming. Refer to the specific radio operator's manual or the ProRoam Release Notes for details. Log Radio 1 and Radio 2 onto the Site 1 used for this test. Ensure the radios are communicating on this system.**

Execution:

1. Continued from Roaming test.
2. Begin slowly travelling from Site 2 back to the coverage of Site 1.
3. As you travel from Site 2 back to Site 1, Radio 1 will log back onto Site 1 (its Priority System) as soon as an acceptable signal is available, even if Site 2 has a stronger signal.
4. Radio 2 will roam onto Site 1 only when its signal is stronger than the signal of Site 2.
   - ☐ Verify that Radio 1 scans back to Site 1 sooner than does Radio 2.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

11. EMERGENCY IN 10A.2

11.1 Local Emergency Multisite on 10A.2 System FDMA [Non Single Cell Simulcast/Multisite Only]

Purpose: **This test is set up to demonstrate the multisite FDMA emergency.**

Expected Results: **This test will verify that the system will not drop a channel to assign a channel in an emergency in FMDA mode.**

Setup: **This test requires six radios and two working ~~working~~ talk paths on the site. Disable channels (if necessary) until there is only two working talk paths on the site.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID	Site #
Radio 1	9980001	TG64101 P25	64101	1
Radio 2	9980002	TG64102 P25	64102	1
Radio 3	9980003	TG64103 P25	64103	1
Radio 4	9980004	TG64101 P25	64101	2
Radio 5	9980005	TG64102 P25	64102	2
Radio 6	9980006	TG64103 P25	64103	2

Execution:

1. Disable channels at site 1 and 2 so that only the site only has two working FDMA talk paths.
2. PTT Radio 1 & 2 to busy up the sites.
3. Declare an emergency on Radio 3.
   - Radio 3 Should enter the Queue.
4. Un-key Radio 4
   - Verify Radio is assigned the call
5. Un-key all radios and clear the emergency with the Radio 1.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

11.2 Local Emergency Multisite on 10A.2 System TDMA

Purpose: **This test is set up to demonstrate the multisite TDMA local emergency.**

Expected Results: **This test will verify that the system will drop a local channel to assign a channel in an emergency in TDMA mode.**

Setup: **This test requires six radios and two working ~~working~~ talk paths on the site. Disable channels (if necessary) until there is only two working talk paths on the site.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID	Site #
Radio 1	9980001	TG64151 P25	64151	1
Radio 2	9980002	TG64152 P25	64152	1
Radio 3	9980003	TG64153 P25	64153	1
Radio 4	9980004	TG64151 P25	64151	2
Radio 5	9980005	TG64152 P25	64152	2
Radio 6	9980006	TG64153 P25	64153	2

Execution:

1. Disable channels at site 1 and 2 so that only the site only has two working TDMA talk paths.
2. PTT Radio 1 & 2 to busy up the sites.
3. Declare an emergency on Radio 3.
   - ☐ Verify call is dropped to Radio 1 and tone is heard
   - ☐ Verify Radio 3 is assigned a channel / one TDMA slot.
   - ☐ Verify a console hears calls from Radio 2 and 3
4. Un-key all radios and clear the emergency with the Radio 1.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

11.3 Remote Emergency Multisite on 10A.2 System TDMA

Purpose: **This test is set up to demonstrate the multisite TDMA local emergency.**

Expected Results: **This test will verify that the system will not drop a remote channel to assign a channel in an emergency in TDMA mode.**

Setup: **This test requires six radios and two working ~~working~~ talk paths on the site. Disable channels (if necessary) until there is only two working talk paths on the site.**

Description	Radio LID	TG Description	TG ID	Site
Radio 1	9980001	TG 64151 P25	64151	1
Radio 2	9980002	TG 64152 P25	64152	1
Radio 3	9980003	TG 64153 P25	64153	1
Radio 4	9980004	TG 64151 P25	64151	2
Radio 5	9980005	TG 64152 P25	64152	2
Radio 6	9980006	TG 64153 P25	64153	2

Execution:

1. Disable channels at site 1 and 2 so that only the site only has two working TDMA talk paths.
2. PTT Radio 4 & 5 to busy up the sites.
3. Declare an emergency on Radio 3.
   - ☐ Verify audio is dropped to Radio 1
   - ☐ Verify calls from radio 4 and 5 continue
   - ☐ Verify Radio 3 is assigned a channel
   - ☐ Verify a console hears calls from Radio 3, 4 and 5
4. Un-key all radios and clear the emergency with the Radio 1.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

12. TRANSCODER TEST

Purpose: **This test will demonstrate the transcoder ability to transcode calls made with different vocoders**

Expected Results: **This test will verify that the transcoder is needed to transcode a call, and each transcoder will transcode calls.**

Setup:

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	9980001	TG 64400OS	64400
Console 9110	9989110	TG 64400OS	64400

Execution:

1. Shutdown s0u1xcda.vida.local, s0u2xcda.vida.local and s0u1xcdb.vida.local.

Transcoder	State
s0u1xcda.vida.local	Off
s0u2xcda.vida.local	Off
s0u1xcdb.vida.local	Off

2. From the console place a call on talk group 64400OS
   - Verify that the call is not heard on a P25 radio on talk group 6400OS, this called failed because there is no working transcoder.

3. Restart s0u1xcda.vida.local.

Transcoder	State
s0u1xcda.vida.local	On
s0u2xcda.vida.local	Off
s0u1xcdb.vida.local	Off

4. From the console place a call on talk group 64400OS
   - Verify that the call is heard on a P25 radio

5. Restart s0u2xcda.vida.local wait for 15 minutes for services to start

6. Shutdown s0u1xcda.vida.local.

7. From the console place a call on talk group 64400OS
   - Verify that the call is heard on a P25 radio on talk group 6400OS this call is using s0u2xcda.vida.local.

Transcoder	State
s0u1xcda.vida.local	Off
s0u2xcda.vida.local	On
s0u1xcdb.vida.local	Off

8. Restart s0u1xcdb.vida.local

9. Shutdown s0u1xcda.vida.local

Transcoder	State
s0u1xcda.vida.local	Off
s0u2xcda.vida.local	Off
s0u1xcdb.vida.local	On

10. From the console place a call on talk group 64400OS
    - Verify that the call is heard on a P25 radio on talk group 6400OS this call is using s0u3xcda.vida.local.

11. Restart s0u2xcda.vida.local and s0u1xcda.vida.local

12. From the console place a call on talk group 64400OS verify that the call is heard on a P25 radio on talk group 6400OS

Transcoder	State
s0u1xcda.vida.local	On
s0u2xcda.vida.local	On
s0u1xcdb.vida.local	On

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

13. P25 PHASE 2 FUNCTIONALITY (Single Site/Simulcast Single Site)

Purpose: **The tests below verify that the P25 Phase 2 implementation provides the additional traffic channel capacity and features of P25 Phase 2 while allowing backwards compatibility with Phase 1 radios and talkgroups.**

Expected Results: **This will verify that a P25 Phase 1 call will work on a Phase 2 system**

Setup: **In the following tests, portables 1 and 2 will be set up as Phase 1 only. Portables 3 and 4 will be set up as Phase 2 and Phase 1 capable, depending upon talk-group. FDMA refers to Phase 1 and TDMA refers to Phase 2. Start a session on the RNM and setup to watch channel assignments using the real time viewer function.**

On a client computer, open the windows internet explorer and browse to https://s0u1rnm.vida.local/nmc and log in with an Active Directory account. Choose the system map and select the 'Launch Application' button. Open the Realtime tab and Click Site Calls. Select the site and expand. Check the box next to the channels and select the to add the channels to the target list. Select the 'ok' button to launch the application. Place a group call from Radio 1 to Radio 2 on the site, and verify that the event viewer displays the talkgroup ID and calling party ID. Verify the state changes from Free to Talk. Verify the TG Alias displays the Group #.

Radio Description	Radio Lid	Talk Group Description	Talk Group ID	System
Radio 1	998001	TG64051 P25	64051	MAC PH 1
Radio 2	998002	TG64051 P25	64051	MAC PH 1
Radio 3	998003	TG64051 P25	64051	MAC PH 2
Radio 4	998004	TG64051 P25	64051	MAC PH 2

13.1 Mixed Mode site to Mixed Mode site Call Phase 1- Phase 1

Purpose: **Demonstrates that a Phase 1 call will work on a Phase 2 system**

Expected Results: **This will verify that a P25 Phase 1 call will work on a Phase 2 system**

Setup: **Turn off radios 3 and 4.**

Execution:

1. PTT Radio 1 and talk. The transmit (TX) indicators should turn on at Radio 1

   - ☐ Verify that the call is assigned as an FDMA by viewing the Real Time Viewer Site Activity on the RNM.

   - ☐ Verify Radios 2 can hear Radio 1.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

13.2 Mixed Mode site to Mixed Mode site Call - Phase 1 and Phase 2

Purpose: **Demonstrates that a mixed mode call can function on a Phase 2 system**

Expected Results: **This test will verify that a Phase 2 radio will hear a call from a Phase 1 radio.**

Setup: **Turn on Radios 1, 2, 3, 4**

Execution:

1. PTT Radio 1 and talk. The transmit (TX) indicators should turn on at Radio 1

   - ☐ Verify that the call is assigned as an FDMA by viewing the Real Time Viewer Site Activity on the RNM.

   - ☐ Verify Radios 2, 3 and 4 can hear Radio 1.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

13.3 Mixed Mode site to Mixed Mode site Call - Phase 1

Purpose: **Demonstrates that a mixed mode call can function on a Phase 2 system**

Expected Results: **This test will verify that a Phase 1 radio will hear a call from a Phase 2 radio.**

Setup: **Turn on Radios 1, 2, 3, 4**

Execution:

1. PTT Radio 3 and talk. The transmit (TX) indicators should turn on at Radio 3

   - ☐ Verify that the call is assigned as an FDMA by viewing the Real Time Viewer Site Activity on the RNM.

   - ☐ Verify Radios 1, 2 and 4 can hear Radio 3.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

13.4 Phase 2 site Call

Purpose: **Demonstrates that a Phase 2 call work on a Phase 2 system**

Expected Results: **This will verify that a P25 Phase 2 call will work on a Phase 2 system**

Setup: **Turn off Radios 1, and 2**

Execution:

1. PTT Radio 3 and talk. The transmit (TX) indicators should turn on at Radio 3

   - ☐ Verify that the call is assigned as an TDMA by viewing the Real Time Viewer Site Activity on the RNM.

   - ☐ Verify Radios 4 can hear Radio 1.

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

14. P25 PHASE 2 FUNCTIONALITY [Non Single Cell Simulcast/Multisite Only]

Purpose: **The tests will show that the system will allow radios that are on different sites to communicate while the radios are on different phases on P25.**

Expected Results: **This test will verify that the system will allow Phase 1 and Phase 2 radio to inter communicate.**

Setup: **In the following tests, portables 1 and 2 will be set up as Phase 1 only. Portables 3 and 4 will be set up as Phase 2 and Phase 1 capable, depending upon talk-group. FDMA refers to Phase 1 and TDMA refers to Phase 2. Start a session on the RNM and setup to watch channel assignments using the real time viewer function.**

On a client computer, open the windows internet explorer and browse to https://s0u1rnm.vida.local/nmc and log in with an Active Directory account. Choose the system map and select the 'Launch Application' button. Open the Realtime tab and Click Site Calls. Select the site and expand. Check the box next to the channels and select the to add the channels to the target list. Select the 'ok' button to launch the application.

Place a group call from Radio 1 to Radio 2 on the site, and verify that the event viewer displays the talk-group ID and calling party ID. Verify the state changes from Free to Talk. Verify the TG Alias displays the Group #.

Radio Description	Radio Lid	Talk Group Description	Talk Group ID	System	Site	On/Off
Radio 1	998001	TG64051 P25	64051	MAC PH 1	1	On
Radio 2	998002	TG64051 P25	64051	MAC PH 1	1	On
Radio 3	998003	TG64051 P25	64051	MAC PH 2	2	On
Radio 4	998004	TG64051 P25	64051	MAC PH 2	2	On

14.1 Mixed Mode site to Mixed Mode site Call Phase 1- Phase 1 [Non Single Cell Simulcast/Multisite Only]

Purpose: **Demonstrates that a Phase 1 call work on a Phase 2 system**

Expected Results: **This will verify that a P25 Phase 1 call will work on a Phase 2 system**

Setup: **Turn off radios 2 and 4.**

Description	Radio LID	TG Description	TG ID	System	Site	On/Off
Radio 1	9980001	TG 64051 P25	64051	MAC PH 1	1	On
Radio 2	9980002	TG 64051 P25	64052	MAC PH 2	1	Off
Radio 3	9980003	TG 64051 P25	64051	MAC PH 1	2	On
Radio 4	9980004	TG 64051 P25	64052	MAC PH 2	2	Off

Execution:

1. PTT Radio 1 and talk.

   - ☐ The transmit (TX) indicators should turn on at Radio 1
   - ☐ Verify that the call is assigned as FDMA at Site 2 by viewing the Real Time Viewer Site Activity on the RNM.
   - ☐ Verify Radio 3 can hear Radio 1.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

14.2 Mixed Mode site to Mixed Mode site Call - Phase 1 and Phase 2 [Non Single Cell Simulcast/Multisite Only]

Purpose: **Demonstrates that a mixed mode call can function on a Phase 2 system**

Expected Results: **This test will verify that Phase 2 radios will hear a call from a Phase 1 radio.**

Setup: **Turn on Radios 1, 2, 3, 4**

Description	Radio LID	TG Description	TG ID	System	Site	On/Off
Radio 1	9980001	TG 64051 P25	64051	MAC PH 1	1	On
Radio 2	9980002	TG 64051 P25	64051	MAC PH 1	1	On
Radio 3	9980003	TG 64051 P25	64051	MAC PH 2	2	On
Radio 4	9980004	TG 64051 P25	64051	MAC PH 2	2	On

Execution:

1. PTT Radio 1 and talk.

   - ☐ The transmit (TX) indicators should turn on at Radio 1
   - ☐ Verify that the call is assigned as an FDMA at site 2 by viewing the Real Time Viewer Site Activity on the RNM.
   - ☐ Verify Radios 2, 3 and 4 can hear Radio 1.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

14.3 Mixed Mode site to Mixed Mode site Call - Phase 1 [Non Single Cell Simulcast/Multisite Only]

Purpose: **Demonstrates that a mixed mode call can function on a Phase 2 system.**

Expected Results: **This test will verify that a Phase 1 radio will hear a call from a Phase 2 radio.**

Setup: **Turn on Radios 1, 2, 3, 4**

Description	Radio LID	TG Description	TG ID	System	Site	On/Off
Radio 1	9980001	TG 64051 P25	64051	MAC PH 1	1	On
Radio 2	9980002	TG 64051 P25	64051	MAC PH 1	1	On
Radio 3	9980003	TG 64051 P25	64051	MAC PH 2	2	On
Radio 4	9980004	TG 64051 P25	64051	MAC PH 2	2	On

Execution:

1. PTT Radio 3 and talk.

   - ☐ The transmit (TX) indicators should turn on at Radio 3
   - ☐ Verify that the call is assigned as an FDMA at site 2 by viewing the Real Time Viewer Site Activity on the RNM.
   - ☐ Verify Radios 1, 2 and 4 can hear Radio 3.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

14.4 Phase 2 site Call [Non Single Cell Simulcast/Multisite Only]

Purpose: **Demonstrate that a Phase 2 call works on a Phase 2 system.**

Expected Results: **Verify that a P25 Phase 2 call will work on a Phase 2 system.**

Setup: **Turn off Radios 1 and 2**

Description	Radio LID	TG Description	TG ID	System	Site	On/Off
Radio 1	9980001	TG 64051 P25	64051	MAC PH 1	1	Off
Radio 2	9980002	TG 64051 P25	64051	MAC PH 1	1	Off
Radio 3	9980003	TG 64051 P25	64051	MAC PH 2	2	On
Radio 4	9980004	TG 64051 P25	64051	MAC PH 2	1	On

Execution:

1. PTT Radio 3 and talk.

   - ☐ The transmit (TX) indicators should turn on at Radio 3
   - ☐ Verify that the call is assigned as a TDMA at Site 1 by viewing the Real Time Viewer Site Activity on the RNM.
   - ☐ Verify Radios 1, 2, & 4 can hear Radio 3.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

15. SYMPHONY DISPATCH FEATURE SET

All Testing done in this section should be done with a user that is in the 'Console' User Group.

15.1 Transmitting With a Microphone (Group Calls, I Calls)

Purpose:	**Confirms the console operator can initiate communication with a terminal radio using the console select functions and foot pedal, for both Group and I Calls.**
Expected Results:	**Confirms communication with the terminal radio**
Setup:	**Radio set to TG64001 P25 and console programmed with talk groupTG64001 P25**

Execution:

1. Press the INSTANT TX function (for example right mouse button) on the module with the test group. Verify
   - ☐ that a channel access tone is heard, a
   - ☐ ripple effect on the 'TX' indicator is displayed
   - ☐ that the call is heard on the radio.
2. Release the Instant TX key
3. Right click on the gear symbol for TG64002 and select 'Select' to make TG64002 the selected talk group. Verify
   - ☐ that the module for TG64002 is highlighted indicating that it is the selected talk group
   - ☐ the module at the top center of the screen changes to 'TG64002'
4. Make call on 64002TG by:
   a. Press the PTT foot pedal.
      - ☐ verify that a channel access tone is heard,
      - ☐ the halo around the 'TX' indicator is displayed
      - ☐ that the call is heard on the radio
      - ☐ verify audio is head at a radio on talk group 64002TG

      i. Release the foot pedal to end the call

   b. Press the headset button.

- ☐ verify that a channel access tone is heard
- ☐ the halo around the 'TX' indicator is displayed
- ☐ that the call is heard on the radio
- ☐ verify audio is head at a radio on talk group 64002TG

i. Release the headset button to end the call.

c. Select the 64002TG button with the mouse.

- ☐ verify that a channel access tone is heard
- ☐ the halo around the 'TX' indicator is displayed
- ☐ that the call is heard on the radio
- ☐ verify audio is head at a radio on talk group 64002TG

i. Release the mouse button to end the call.

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

15.2 Receiving Calls (Unit ID Display, Talk group ID Display, Aliasing)

Purpose: **Confirm the console operator can receive communications from a terminal radio, using both talkgroup and individual calling.**

Expected Results: **Communications are initiated and received on the appropriate speaker (select or unselect) and the radio's ID is displayed.**

Setup: **Console should have talk groups 64001TU and 64002TU programmed with 64002TU selected and Radio set to TG64001 P25**

15.2.1 Talk Group Call

Execution:

1. Key the radio and verify
   - ☐ That the call is heard at the unselect speaker
   - ☐ That the calling radio ID is displayed on the module for TG64001
   - ☐ A green light is displayed indicating an incoming call on module TG64001
2. Switch the radios talk group to 64002TU and key the radio.
   - ☐ That the call is heard at the select speaker
   - ☐ That the calling radio ID is displayed on the module for TG64002
   - ☐ A green light is displayed indicating an incoming call on module TG64002

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	

15.2.2 Individual Call (Unit – Unit)

Execution:

1. Right click on the 'Harris' box on the top left hand side of the screen.
2. Select 'Open Directory' this will open a pop up window for the 'Directory'
3. Select the 'Users' tab
4. Select 'Radio 1' under the "ALIAS' column
5. Press the 'Radio 1' button the right side to the screen to place an individual call to radio 1.
   - ☐ Verify the ripple effect on the 'TX' indicator is displayed
   - ☐ Verify a ringing tone will be heard at the console and the radio
   - ☐ Verify radio displays 'INDV' and consoles 'ID"
6. Respond to the console by PTTing the radio
   - ☐ Verify that the call is heard on the console and that the calling radio's ID and the Call Indicator are displayed.

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

15.3 Emergency Call and Emergency Alarm

Purpose: **Confirms the console indicates an emergency declared by a terminal radio and can reset and clear the emergency.**

Expected Results: **The console indicates and can clear the emergency.**

Setup: **This test requires a test radio capable of generating and clearing an emergency (i.e. Supervisor Radio).**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001

Execution:

1. Select the 64002TG in the console. Using the test radio, declare an emergency on 64001TG.
   - ☐ Verify the module for '64001TG' turns red,
   - ☐ Verify the ID/Name of the test radio is displayed
   - ☐ Verify emergency alert tone is heard on the console.
2. Select the triangle with a '!' to access the emergency menu.
   - ☐ the acknowledge 'Ack' button is red
   - ☐ the check box is red
3. Using the radio, transmit on the talk group
   - ☐ Verify that the call is received by the console.
4. With the console, transmit on the group with the emergency.
   - ☐ Verify the test radio receives the call, and is still in emergency mode.
5. Acknowledge the emergency by selecting the 'Ack' button
   - ☐ Verify the button changes from 'Ack' to clear
   - ☐ verify the radio and the console are still in emergency mode
6. Clear the emergency by selecting the 'Clear X' button

- ☐ Verify the console clears the emergency
- ☐ Verify the radio clears the emergency

7. Transmit on the radio
8. Verify the emergency is cleared and normal group calls have resumed.
9. Select 64001TG group selected on the console, declare an emergency on the test group by pressing the ‘Emer Declare’.
   - ☐ Verify the console and radio have the same indications as steps 2 to 4.
10. Acknowledge by hitting ‘Ack’ in step 4
11. Clear the emergency with the console.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

15.4 System Wide Call (All Call & Announcements)

Purpose: **Confirm the console can initiate system wide calls.**

Expected Results: **The console can initiate both All Calls and Announcement Calls.**

Setup: **Program console modules with the 'TG64000 P25' talk group**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64051 P25	64051
Radio 2	998002	TG64052 P25	64052
Radio 3	998003	TG64001 P25	64001
Radio 4	998004	TG64001 P25	64002

Execution:

1. Press INSTANT TX on the module with 'TG64000 P25'.
   - Verify that a channel access tone is heard,
   - Verify the ripple effect on the 'TX' indicator is displayed
   - Verify that the call is heard at all radios
2. Release the Instant TX key.
3. Press INSTANT TX on the module with 'TG64051 P25'.
   - Verify that a channel access tone is heard,
   - Verify the ripple effect is displayed
   - Verify the call is heard at Radios 1. Verify Radios 2, 3
   - Verify radio 4 did not hear the audio.
4. Release the Instant TX key.
5. Press INSTANT TX on the module with 'TG64001 P25'.

- ☐ Verify that a channel access tone is heard,
- ☐ The ripple effect is displayed,
- ☐ The call is heard at Radios 3.
- ☐ Verify that Radios 1 2
- ☐ Radio 4 did not hear the audio.

6. Release the Instant TX key.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

15.5 Alert Tones

Purpose: **Confirm the console can initiate alert tones which can be heard at the terminal radio.**

Expected Results: **The tones can be initiated and heard.**

Setup: **Console 1 programmed with TG64002 and TG64001 selected.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64002 P25	64002

Execution:

1. Make TG64001 P25 the selected talk group.
2. Select the tones tab on the talk group module.
3. Select one of the three ALERT TONE keys by selecting the drop down list next to the orange button the console with a method other than the mouse.
4. Radio 1 will receive the call.
5. Test that all three alert tones can be heard on the radio.
   - ☐ Verify the ALERT TONE is received by Radio 1 and also heard on the console (to hear the tones on the console, press and hold the foot pedal and listen for the tone on the SELECT speaker).
6. When the ALERT TONE key is released
   - ☐ Verify the call on Radio 1 drops

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

15.6 Console Pre-Empt

Purpose: **Confirm the console can pre-empt an ongoing call between terminal radios.**

Expected Results: **The call started by the radio will be interrupted by the console.**

Setup: **Console 1 programmed with talk-group TG64001 P25**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	9981001	TG64001 P25	64001
Radio 2	9981002	TG64001 P25	64001

Execution:

1. Key Radio 1 on the TG64001 and hold the call up. Verify that audio is heard at Radio 2 and the console.

2. Key the console on TG64001and hold the while continuing to hold the call up on Radio 1

   - ☐ Verify the console pre-empts
   - ☐ Verify that the transmit indicator is displayed along with the pre-empted caller LID and CALL indicator
   - ☐ Verify that the second radio begins to hear the console audio and not the first radio call.
   - ☐ Verify that the pre-empted radio audio is still heard on the pre-empting console.

3. Un-key the first Radio.

   - ☐ Verify that the pre-empted caller LID and CALL indicators are removed and the pre-empted radio audio is no longer heard on the pre-empting console.

4. Un-key the console.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

15.7 Simulselect

Purpose: **Confirms operation of the console Simulselect feature, which allows multiple talk groups to be selected for communication simultaneously.**

Expected Results: **The console can select multiple talk groups and communication is allowed.**

Setup **Console 1 programmed with talk groups TG64051 P25, TG64052 P25, TG64053 P25, and TG64054 P25.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64051 P25	64051
Radio 2	998002	TG64052 P25	64052
Radio 3	998003	TG64001 P25	64001
Radio 4	998004	TG64001 P25	64002

Execution:

1. Create simulselect group on the 4 test group modules
2. Place a call from the console on the simulselect group
   - ☐ Verify that the call is heard all four radios
3. Place a call from each radio
   - ☐ Verify that only the console hears the calls
   - ☐ Verify only the radios on similar talk groups here the call
4. Deactivate the simulselect group.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

15.8 Patch

Purpose: **Confirms the console patch feature creates shared communication between multiple selected talk groups.**

Expected Results: **The patched talk groups can communicate.**

Setup **Console 1 programmed with talk groups TG64051 P25, TG64052 P25, TG64053 P25, and TG64054 P25.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64051 P25	64051
Radio 2	998002	TG64052 P25	64052
Radio 3	998003	TG64001 P25	64001
Radio 4	998004	TG64001 P25	64002

Execution:

1. Create patch on PATCH 1 with all four groups above.
2. Place a call from the newly created patch
   - ☐ Verify that the call is heard on all the radios
3. Place a call from each radio
   - ☐ Verify that the call is heard on the console and each radio.
4. Deactivate the patch.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

15.9 Console to Console Cross-mute

Purpose: **Confirm creation of a cross-mute of another console to quiet the muted consoles audio on the local console.**

Expected Results: **The cross-muted console's audio cannot be heard on the local console.**

Setup: **Establish two consoles (A and B) to test the Crossmute function. The Consoles must be on the same NSC. Program and select a test group on both consoles.**

Execution:

1. Place a call on console A on the test group.
   - ☐ Verify that console B can hear console A.
2. Open the Symphony Configuration Utility for console B in the 'General' section add the ID for console A to the 'Cross Mute' list.
3. Select 'Apply' to save the changes.
4. Place a call on console A on the test group
   - ☐ Verify the call can't be heard at console B.
5. Restore the desired cross mute setup.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

15.10 Call History

Purpose: **Confirms a history of calls processed at the console.**

Expected Results: **The history is accessible and valid.**

Setup: **This test compares programmed module call activity to the history scroll lists. Utility page, dispatch menu will be selected. Select either the "Select History" or "Unselect History".**

Execution:

1. Press the 'Scroll Up' and 'Scroll Down' buttons to scroll through the Unselect call history list.
   - Compare these calls with known activity.
2. Press the 'Scroll Up' and 'Scroll Down' buttons to scroll through the selected call history list.
   - Compare these calls with known activity.
3. Press the 'Esc' button to exit the history scroll mode.
4. To monitor call history on a single group use the 'module history' button on the 'module modify' menu.
5. Use the 'scroll up' and 'scroll down' buttons to scroll through the calls for the picked module.
   - Compare these calls with known activity.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

15.11 Group Call

Purpose: **Confirms the scan function which allows a smartphone to hear audio on selected talk-groups other than the current talk-group.**

Expected Results: **Selected talk-group call audio is heard.**

Setup: **Set smart-phones 1, 2, & 3 to (Group A) per test group structure. Make sure Scan is turned OFF.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
BeOn_202	998202	TG64151 P25	64151
BeOn_203	998203	TG64151 P25	64151
BeOn_204	998204	TG64151 P25	64151

Execution:

1. PTT on BeOn_202 and talk.
   - ☐ The transmit (TX) indicators should turn on at BeOn_202.
   - ☐ Audio should be heard in BeOn_203, and BeOn_204 .
   - ☐ The ID of BeOn_202 should be seen at BeOn_203, and BeOn_204.
2. Set BeOn_204 to TG64152 P25. PTT on BeOn_202 and talk.
   - ☐ The transmit (TX) indicators should turn on at BeOn_202.
   - ☐ Audio should be heard in BeOn_203 only.
   - ☐ The ID of BeOn_202 should be seen at BeOn_203 only.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

15.12 Individual (Private) Call

Purpose: **Confirms individual calls can be initiated using BeOn enabled smartphones.**

Expected Results: **Individual calls are confirmed.**

Setup:

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
BeOn_202	998202	TG64151 P25	64151
BeOn_203	998203	TG64151 P25	64151
BeOn_204	998204	TG64151 P25	64151

Execution:

1. Using the BeOn_202, select the pre-stored ID of BeOn_203 or enter the BeOn_203 ID directly from the keypad, and PTT smartphone 1.

   - ☐ Verify that BeOn_203 receives the call and displays the ID of smartphone 1.
   - ☐ Verify that BeOn_204 remains idle.

2. Release the PTT on BeOn_202 and immediately PTT on BeOn_203.

   - ☐ Verify that BeOn_202 receives the call and displays the ID of BeOn_203.
   - ☐ Verify BeOn_204 remains idle.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

15.13 Group Scan

Purpose: **Confirms the scan function which allows a smartphone to hear audio on selected talk-groups other than the current talk-group.**

Expected Results: **Selected talk-group call audio is heard.**

Setup: **BeOn_202 set up with TG64151 P25 and TG64152 P25 in the scan list, TG64151 P25 selected, and group scan initially disabled.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
BeOn_202	998202	TG64151 P25	64151
BeOn_203	998203	TG64151 P25	64151
BeOn_204	998204	TG64151 P25	64151

Execution:

1. Place a call from BeOn_203 on TG64151 P25.
   - ☐ Verify the call is received and audio is heard on BeOn_202.
2. Place a call from BeOn_203 on TG64152 P25.
   - ☐ Verify the call is not received by BeOn_202.
3. Enable group scan on BeOn_202.
4. Place another call from BeOn_203 on TG64152 P25.
   - ☐ Verify that the call is now received and audio is heard on BeOn_202.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	

15.14 Emergency Group Call

Purpose: **Confirms an emergency can be declared, recognized and cleared by a smartphone.**

Expected Results: **The emergency is declared, recognized and cleared.**

Setup:

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
BeOn_202	998202	TG64151 P25	64151
BeOn_203	998203	TG64152 P25	64152
BeOn_204	998204	TG64153 P25	64153

Execution:

1. Press the Emergency call button on BeOn_204 and then PTT BeOn_204.

   - ☐ Verify that BeOn_204 indicates the “TX EMER” declaration and that it reverts to the home group.

   - ☐ Verify that BeOn_202 and BeOn_203 indicate a “RX EMER” and hear audio on the emergency home group.

2. Clear the emergency with the Supervisor smartphone (BeOn_202).

   - ☐ Verify the emergency clears in the smartphones.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

16. BEON FEATURES

Purpose: **These will test the BeOn features.**

Expected Results: **This test will demonstrate that BeOn works as designed.**

Setup: **This test will show that the BeOn system allows a smartphone to communicate with the radio system.**

16.1 Transmit Grant Tone

Purpose: **This test will demonstrate the grant tone on BeOn.**

Expected Results: **When the smartphone PTTs on the BeOn app it will play a grant tone.**

Setup: **Grant tone (Ready to Talk tone) enabled in smartphone radio personality.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
BeOn_202	998202	TG64151 P25	64151
BeOn_203	998203	TG64151 P25	64151
BeOn_204	998204	TG64151 P25	64151

Execution:

1. Press PTT button on smartphone with valid group selected.

☐ Verify grant tone is heard at smartphone when working channel access is granted.

Note: If the call is queued, the grant tone will be delayed until the call is assigned a working channel.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

16.2 Group Call

Purpose: **Confirms the scan function which allows a smartphone to hear audio on selected talk-groups other than the current talk-group.**

Expected Results: **Selected talk-group call audio is heard.**

Setup: **Set smart-phones 1, 2, & 3 to (Group A) per test group structure. Make sure Scan is turned OFF.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
BeOn_202	998202	TG64151 P25	64151
BeOn_203	998203	TG64151 P25	64151
BeOn_204	998204	TG64151 P25	64151

Execution:

3. PTT on BeOn_202 and talk.
   - ☐ The transmit (TX) indicators should turn on at BeOn_202.
   - ☐ Audio should be heard in BeOn_203, and BeOn_204.
   - ☐ The ID of BeOn_202 should be seen at BeOn_203, and BeOn_204.
4. Set BeOn_204 to TG64152 P25. PTT on BeOn_202 and talk.
   - ☐ The transmit (TX) indicators should turn on at BeOn_202.
   - ☐ Audio should be heard in BeOn_203 only.
   - ☐ The ID of BeOn_202 should be seen at BeOn_203 only.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

16.3 Individual (Private) Call

Purpose: **Confirms individual calls can be initiated using BeOn enabled smartphones.**

Expected Results: **Individual calls are confirmed.**

Setup:

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
BeOn_202	998202	TG64151 P25	64151
BeOn_203	998203	TG64151 P25	64151
BeOn_204	998204	TG64151 P25	64151

Execution:

3. Using the BeOn_202, select the pre-stored ID of BeOn_203 or enter the BeOn_203 ID directly from the keypad, and PTT smartphone 1.

   - ☐ Verify that BeOn_203 receives the call and displays the ID of smartphone 1.
   - ☐ Verify that BeOn_204 remains idle.

4. Release the PTT on BeOn_202 and immediately PTT on BeOn_203.

   - ☐ Verify that BeOn_202 receives the call and displays the ID of BeOn_203.
   - ☐ Verify BeOn_204 remains idle.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

16.4 Group Scan

Purpose: **Confirms the scan function which allows a smartphone to hear audio on selected talk-groups other than the current talk-group.**

Expected Results: **Selected talk-group call audio is heard.**

Setup: **BeOn_202 set up with TG64151 P25 and TG64152 P25 in the scan list, TG64151 P25 selected, and group scan initially disabled.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
BeOn_202	998202	TG64151 P25	64151
BeOn_203	998203	TG64151 P25	64151
BeOn_204	998204	TG64151 P25	64151

Execution:

5. Place a call from BeOn_203 on TG64151 P25.

   - ☐ Verify the call is received and audio is heard on BeOn_202.

6. Place a call from BeOn_203 on TG64152 P25.

   - ☐ Verify the call is not received by BeOn_202.

7. Enable group scan on BeOn_202.

8. Place another call from BeOn_203 on TG64152 P25.

   - ☐ Verify that the call is now received and audio is heard on BeOn_202.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

16.5 Emergency Group Call

Purpose: **Confirms an emergency can be declared, recognized and cleared by a smartphone.**

Expected Results: **The emergency is declared, recognized and cleared.**

Setup:

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
BeOn_202	998202	TG64151 P25	64151
BeOn_203	998203	TG64152 P25	64152
BeOn_204	998204	TG64153 P25	64153

Execution:

3. Press the Emergency call button on BeOn_204 and then PTT BeOn_204.

   - ☐ Verify that BeOn_204 indicates the “TX EMER” declaration and that it reverts to the home group.

   - ☐ Verify that BeOn_202 and BeOn_203 indicate a “RX EMER” and hear audio on the emergency home group.

4. Clear the emergency with the Supervisor smartphone (BeOn_202).

   - ☐ Verify the emergency clears in the smartphones.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

17. TRUNKED LOGGING RECORDER

17.1 Group Call

Purpose: **Confirms group call audio is captured, recorded and accessible on the logging recorder**

Expected Results: **Calls are captured, recorded and accessible.**

Setup:

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64051 P25	64051
Radio 2	998002	TG64051 P25	64051
Radio 3	998003	TG64051 P25	64051

1. PTT radio 1 and talk.

   - ☐ Audio should be heard on radio 2. Note the Start time of the call and the approximate duration.

2. Retrieve the call from the Logging Recorder.

   - ☐ Verify the Caller, Callee, Start Time, and duration.
   - ☐ The Caller should be the LID for Radio 1 and the Callee should be the GID for 64051. Verification should include the LID/GID and its Alias as defined by the UAS.
   - ☐ Verify that the call is identified as a Group Call.

3. Playback the audio

   - ☐ Confirm that the playback audio is all recorded and intelligible.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

17.2 Emergency Group Call

Purpose: **Confirms emergency group call audio is captured, recorded and accessible on the logging recorder**

Expected Results: **Calls are captured, recorded and accessible.**

Setup:

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64051 P25	64051
Radio 2	998002	TG64051 P25	64051
Radio 3	998003	TG64051 P25	64051

Execution:

1. Press the Emergency call button on radio 2. Talk during the Hot Mic transmit time.
2. Clear the emergency with the radio 1.
3. Retrieve the call from the Logging Recorder.
   - Verify the Caller
   - Verify the Callee
   - Verify the start time
   - Verify the duration
   - The Caller should be the LID for Radio 2 and the Callee should be the GID for the Home Group.
   - Verification should include the LID/GID and its Alias as defined by the UAS.
   - Verify that the call is identified as an Emergency.
   - Playback the audio and confirm that it is all recorded and intelligible.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

18. P25 SIMULCAST BYPASS OPERATION

Program the MASTR V modules (both Control Points and Transmit Sites) to the Final Configuration. Refer to the installation manual for the guide to setting TX Traffic Controllers / CP Traffic Controllers personality parameters.

Verify the BYPASS plan has been reviewed and approved by customer representative. This procedure makes assumptions on bypass sites before implementation and test of the System. After WMS/Panther signal strength data collection, final decision will be made on the actual bypass “ON” and “OFF” sites.

Prepare a minimum of two terminal radios programmed to operate on the active BYPASS site and the main simulcast system.

18.1 Site OFF - Final Configuration

Purpose: **Confirm sites configured to be in the “OFF” condition during BYPASS are in the expected BYPASS mode.**

Expected Results: **The “OFF” site traffic controllers have no control channel.**

Setup: **Sites intended to be “OFF” in event of BYPASS must have all channels set to disabled (unchecked in Device Manager, TC personality).**

Execution:

1. At one of the sites designated as an “off” site, create a condition to force BYPASS by disconnecting the router to MPLS connection. All other sites will have the HPAs disabled locally.

   - ☐ Verify transmit site is in BYPASS mode.
   - ☐ The Traffic Controller module display indicates “TC” instead of “TR”. Note: TC= Working Traffic Channel, standalone mode, TR=Working Channel, simulcast mode, and Control Channel, simulcast mode is indicated by the transmit LED indicator.

2. Observe the repeater (station) Traffic Controller modules.

   - ☐ Verify there is no active control channel.
   - ☐ Verify no stations are keyed or producing RF power.

3. Restore the site to normal by returning the site to simulcast mode by reconnecting the router to MPLS connection.

- ☐ Verify transmit site is in normal simulcast mode. The Traffic Controller modules will indicate “TR(n)” , where n is the channel number.

4. Repeat steps 1-3 for the remaining “OFF” bypass sites in the simulcast system under test.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

18.2 Site ON (trunking) - Final Configuration

Purpose: **Confirm sites configured to be in the "ON" condition during BYPASS are in the expected BYPASS mode.**

Expected Results: **The "ON" site traffic controllers have a control channel and calls to terminal radios can be initiated.**

Setup:

Execution:

1. Create a condition to force BYPASS by disconnecting the router to MPLS connection.

   - ☐ Verify transmit site is in BYPASS mode. BYPS LED on Baseband module and the Traffic Controller module display indicates either "TC" or "CC" instead of "TR.
   - ☐ Observe the stations/repeater Traffic Controller modules. Verify there is an active control channel on one of the Traffic Controller modules. The remaining repeater/stations Traffic Controller modules will indicate "TC".
   - ☐ Verify the station appearing as control channel is keyed, producing RF power and modulated with control channel data.
   - ☐ Verify a terminal radio set to the system programmed for the site in BYPASS with the correct site ID recognizes the site's control channel data.

2. Key the terminal radio on a group call.

   - ☐ Verify a working channel assignment is made within the channel group allowed in the personality.
   - ☐ Verify the call is heard on a second terminal radio set to the active BYPASS system.

3. Restore the site to simulcast mode by reconnecting the router to MPLS connection.

   - ☐ Verify transmit site is in normal simulcast mode. Traffic Controller modules indicate "TR(n).

4. Repeat steps 1-3 for the remaining "ON" bypass sites in the simulcast system under test.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

18.3 Control Point Trunking Reset Control

Purpose: **A properly set up Simulcast BYPASS system will disable CP Traffic Controller modules associated with active channels at a TX site operating in BYPASS. This keeps the remaining sites operating in Simulcast mode from being assigned to channels expected to be active at the site in BYPASS. Sites programmed to be OFF in BYPASS will not require any Traffic Controller modules to be held OFF.**

Expected Results: **This test will verify that the Control Point Traffic Controller modules will be held OFF corresponding to the active channels at a site as a result of the TX site being in BYPASS.**

Setup:

Execution:

1. Force a TX site that will become active into BYPASS by disconnecting the router to MPLS connection.

   - ☐ Verify TX site is in BYPASS mode.
   - ☐ Verify transmit site is in BYPASS mode. Traffic Controller module display indicates either “TC” or “CC” instead of “TR”.
   - ☐ Verify the CP Traffic Controller modules on the channels intended to be OFF are held OFF.

2. Observe the RNM screen for the simulcast system.

   - ☐ Verify the channels intended to be OFF at the Control Point are reported as OFF (RED).

3. Restore the site to simulcast mode by reconnecting the router to MPLS connection.

   - ☐ Verify the TX site Traffic Controller modules revert to normal Simulcast.
   - ☐ Verify the CP Traffic Controller modules associated with the site in BYPASS are returned to normal.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

18.4 Bypass – Site Minimum Channels

Purpose:	**Confirm a site enters bypass when active channels fall below site minimum channels setting.**
Expected Results:	**The site enters bypass mode.**
Setup:	**Sites are configured with cluster minimum channels set to 6 and site minimum channels to 7.** **Bypass Plan: TR Site 1 Ch 3,4,5; TR Site 2 Ch 6,7,8; TR site 3 Ch 9,10,11 TR Sites 4 and 5 dark**
Note	**Settings and bypass plan can be customer final settings; execution will have to adjust to accommodate those settings.**

Execution:

1. At TR site 1 disable channels 8 - 11 using the TX disable switch on the PA (only channels 1-7 are still functioning).

   - Verify system and site still functioning in simulcast; the disabled channels 8-11 are in alarm state at the control point site.

   - At TR site 1 the Traffic Controller modules displays still indicates “TR” not “TC” or “CC”. Note: TC= Working Traffic Channel, standalone mode, TR=Working Channel, simulcast mode, and Control Channel, simulcast mode is indicated by the transmit LED indicator.

2. At the same site disable channel 7 using the TX disable switch on the PA.

   - Verify system is still functioning in simulcast. Control Point ch 3,4 and 5 in alarm state.

   - Verify TR site 1 is in bypass. The Traffic Controller module display indicates “TC” instead of “TR”. All channels status indicates alarm. Note: TC= Working Traffic Channel, standalone mode, TR=Working Channel, simulcast mode, and Control Channel, simulcast mode is indicated by the transmit LED indicator always on.

3. At the same site restore all channels back to service (enable the PA using the TX disable switch on the PA).

   - Verify transmit site 1 is in normal simulcast mode. The Traffic Controller modules will indicate “TR(n)” , where n is the channel number.

   - Verify all channels are in service at the control point.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

18.5 Bypass – Cluster Minimum Channels – TR site failures

Purpose: **Confirm all sites enter bypass when available channels fall below the cluster minimum channels setting. Depending upon the system size, bypass plan and which channels have been failed a subset of sites may subsequently come out of bypass and operate as a cluster before any channels are restored to service.**

Expected Results: All site in the system enter bypass mode.

Setup: **Sites are configured with cluster minimum channels set to 6 and site minimum channels set to 7 (these settings are normally lower; they are set high to simplify testing) .**

Execution:

1. At TR site 1 disable channels 9, 10 and 11 using the TX disable switch on the PA (8 channels are still functioning.

   - ☐ Verify system and site still functioning in simulcast.

   - ☐ The Traffic Controller module displays still indicates “TR” not “TC” or “CC”. Note: TC= Working Traffic Channel, standalone mode, TR=Working Channel, simulcast mode, and Control Channel, simulcast mode is indicated by the transmit LED indicator.

2. At TR site 3 disable channels 6, 7 and 8 using the TX disable switch on the PA (5 channels are still functioning).

   - ☐ Verify All sites have entered bypass (the TCs display “TC” and “CC”, not “TR” and every channel status indicates failed at every site.

3. Enable the PAs at the sites using the TX disable switches.

   - ☐ Verify the system recovers to simulcast mode with all transmit sites in normal simulcast mode. The Traffic Controller modules will indicate “TR(n)” , where n is the channel number.

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

18.6 Site ON (trunking) - Enhanced bypass Final Configuration

Purpose: **Confirm sites configured to be in the "ON" condition during BYPASS are in the expected BYPASS mode and can connect to VNIC.**

Expected Results: **The "ON" site traffic controllers have a control channel and calls between terminal radios and dispatch can be made.**

Setup:

Execution:

1. Create a condition to force BYPASS that does not disrupt network connectivity by logging into both GPS receivers and configuring their notifications to set the major alarm threshold to minimum satellites 12 and duration below threshold 5 seconds. This will cause the GPS receivers to set a major alarm after 5 seconds.

2. Configure Notifications from Spectracom GPS Receivers

Navigate to: **Management → Notifications**

2. In the **Events** window pane, click the **GPS** tab.
3. Set the Major Alarm Threshold as follows:
   a. Minimum Satellites: **12**
   b. Duration Below Threshold: **5**
4. Click: **[Submit]**

3. Verify transmit site is in BYPASS mode. The Traffic Controller module display indicates either “TC” or “CC” instead of “TR”.

☐ Observe the stations/repeater Traffic Controller modules. Verify there is an active control channel on one of the Traffic Controller modules. The remaining repeater/stations Traffic Controller modules will indicate “TC”.

☐ Verify the station appearing as control channel is keyed, producing RF power and modulated with control channel data.

☐ Verify a terminal radio set to the system programmed for the site in BYPASS with the correct site ID recognizes the site’s control channel data.

4. Key the terminal radio on a group call.

☐ Verify a working channel assignment is made within the channel group allowed in the personality.

5. Restore the site to simulcast mode by restoring the GPS major alarm notification threshold to minimum satellites = 1 and duration = 345600 for both GPS receivers.

- ☐ Verify transmit site is in normal simulcast mode. Traffic Controller modules indicate "TR(n).

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

19. VIDA INTER-OPERABILITY GATEWAY TEST

19.1 Local Interoperability

Purpose: **The purpose of this test is to verify correct functionality of the Interoperability Gateway.**

Expected Results: **Verify that the**

Setup: **The Interoperability Gateway connects via 4-wire audio connections in its Universal Access Cards(UAC) cards to interoperability radio units (mobile or desktop). The Gateway also connects to a router and the Network Switching Center (NSC) to provide call functionality across the network.**

Execution:

1. Select Inter-op group 1 on the radio.
2. Initiate a call from the radio to group 1
   - ☐ Verify that audio is heard on inter-op group 1 radio.
3. Initiate a call from the inter-op group 1 radio to group 1
   - ☐ Verify that audio is heard on the radio.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

20. INFORMATION ASSURANCE TESTING

20.1 Active Directory

Purpose: **The purpose of this test is to view the GPO structure on an Active Directory server.**

Expected Results: **The GPO structure is valid.**

Setup: **None**

Execution:

1. Log into an Active Directory Server.
2. Open AD Users/Groups
   - Validate that the computers have been added to AD.
3. Open Group Policies Management
   - Verify VIDA GPO Structure

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

20.2 Cisco Works

Purpose: **This test will test the Cisco Works.**

Expected Results: **This test will verify that the Cisco Works is communicating with the necessary devices.**

Setup: **The purpose of this test is to verify that Cisco Works is configured and is capable of accessing the Cisco devices on the network.**

Execution:

1. Use Internet Explorer on a client PC to browse to CiscoWorks
2. Select ‘RME’
3. Expand ‘Devices’
4. Select ‘Inventory’
5. Select ‘View Inventory Connection Status’
6. Select the number on Inventory Collected
7. Select a device
8. Expand ‘All Devices’
9. Select a device
10. Select ‘Cisco View’
11. Select a port
12. Select ‘Configure’
13. Click on a Device
    - View ‘Configuration’
14. Close windows and log out

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

20.3 ePolicy Orchestrator

Purpose: **The purpose of this test is to verify that ePolicy Orchestrator is communicating with its end devices and that it will report actions that have been taken by McAfee Antivirus on a remote computer.**

Expected Results: **ePolicy Orchestrator is accessible and displays valid reporting.**

Setup: **None**

Execution:

1. Use Internet Explorer on a client PC to navigate to the McAfee E-Policy Orchestrator server
2. Log in using proper credentials
3. Go to the Main Screen
   - ☐ Verify all servers have been added to policies.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

20.4 Backup

Purpose: **The purpose of this test is to verify that the Unitrends server has a schedule for performing backups of network computers and that it can display the backup status of those computers**

Expected Results: **The test will verify that the backup are configured.**

Setup: **None**

Execution:

1. Use Internet Explorer on a client PC to navigate to the Unitrends Backup UAC
2. Log in using proper log in credentials
3. Go to the Main Screen
   - Verify that devices are visible and backups are configured.

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

20.5 Intrusion Detection

Purpose: **The purpose of this test is to verify that the SouceFire Defense Center is communicating with its IDS sensors at remote sites across the network.**

Expected Results: **SouceFire Defense Center is communicating with its IDS sensors.**

Setup: **None**

Execution:

1. Use Internet Explorer on a client PC to navigate to the Sourcefire Defense Center
2. Log in using proper credentials
3. Go to Defense Center Dashboard
4. Click Operations. Go to Sensors
   - ☐ Verify that all Sensors are visible.

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

20.6 SysLog

Purpose: **The purpose of this test is to verify that network devices are sending SysLog messages to the LogLogic server.**

Expected Results: **This test will verify that the clients are reporting to the Log Logic.**

Setup: **None**

Execution:

1. Use Internet Explorer on a client PC to navigate to the LogLogic Syslog web page
2. Log in using proper log in credentials
3. Go to LogLogic System Status Dashboard
4. Click Log Source Status
   - ☐ Verify current devices are reporting.

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

20.7 SUMS

Purpose: **To demonstrate that the SUMS server is communicating with the remote client.**

Expected Results: **This test will verify that the SUMS server is communicating with the remote clients and that the remote clients are updated.**

Setup: **None**

Execution:

1. Log into the SUMS server and launch the ‘IBM Endpoint Manager Console’ and log into the console with the SUMS administers user.

2. Expand ‘Sites’ ‘Custom Sites’ ‘Vida’ and select ‘Subscribed Computers’

   - Verify that each Computer is listed, in the Subscribed Computers window
   - Check to make sure that each computer has reported to the SUMS server with in the last 30 minutes by checking the ‘Last Report Time’ column.
   - To check to make sure all the Subscriber Computers are update by selecting the ‘Baseline’ in the left hand window.
   - Make sure the ‘Baseline’ window is empty or all computer in the window are gray.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

21. ACTION ITEMS

Test #	Page #	Action/Issue
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
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_____	_____	_____

22. ACRONYMS AND DEFINITIONS

AD	Active Directory
AES	Advanced Encryption Standard
Confirmed Call	A confirmed call is a special type of call where the call is queued until all sites have resources available, or until the confirmed call timer expires (configurable, typically one or two seconds)
DM	Device Manager
DNS	Domain Name Server
FDMA	Frequency Division Multiple Access
FIPS 140-2	Federal Information Processing Standard, publication 140-2. The title is “Security Requirements for Cryptographic Modules”
FM	Frequency Modulation
HA	High Availability
IFW	Internet Firewall
Individual Call	An individual call is a private call between one user and another. It can be between two radios, or between one radio and a dispatch console
IP	Internet Protocol
IPS	Intrusion Prevention System
ISSI	Inter Sub System Interface. This is the interface between WACNs, in the Harris architecture an interface between a VNIC and a foreign P25 system
KEK	Key Encryption Key
KID	16 bit Encryption Key ID
KMF	Key Management Facility
LED	Light Emitting Diode
MASTR V	A Harris base station product

MDIS	Mobile Data Intermediate System, a Harris data switch used in Harris' OpenSky Architecture
MES	Mobile End System, a subscriber radio
MME	Miniature Mobility Exchange, which consists of Harris software running on a SitePro card at the base site. The MME runs the SNDCP layer of the data protocol and is the equivalent of the P25 RFG (RF Gateway)
NSC	Network Switching Center
NSS	Network Switching Server
NWS	Network Sentry
OTAP	Over The Air Programming
OTAR	Over The Air Rekeying
P25	Project 25, a suite of standards for digital radio communications, developed by the Association of Public Safety Communications Officials (APCO) under the TIA TR-8 engineering committee, and published as the TIA-102 set of documents
Priority Talkgroup	The priority talkgroup selected on the subscriber device. Usually this is the talkgroup that the radio will transmit on when the user presses PTT
ProFile	A Harris product used for configuring radios over the P25 radio channel
ProScan	A Harris software algorithm used for radio roaming
PSAP	Public Safety Access Point, usually an agency dispatch center
PSTN	Public Switched Telephone Network
PTT	Push To Talk
RAR	Regional Access Router
RF	Radio Frequency
RFW	Regional Firewall
RMS	Regional Management Server

RNM	Regional Network Manager
RS	Reed Solomon, a form of error detection and correction coding
RSM	Regional Site Manager, a server which runs the RSM, Activity Warehouse and Device Manager applications
SACCH	Slow Associated Control Channel (Phase 2)
SAN	Storage Area Network
Sourcefire DFC	Defense Center
SS	Status Symbol (a two bit field in the control channel, used for channel access control signaling)
SSL	Secure Socket Layers
SSH	Secure Shell is a program to log into another computer over a network, to execute commands in a remote machine, and to move files from one machine to another. It provides strong authentication and secure communications over insecure channels. It is a replacement for rlogin, rsh, rcp, and rdist.
SUMS	Security Update Management Service (a Harris product)
System ID	The System ID is a 12 bit field of the network address which identifies the VNIC
TAC	Technical Assistance Center, a Harris service
TACACS	Terminal Access Controller Access Control System
TDMA	Time Division Multiple Access
TDU	Terminator Data Unit, used to terminate a voice message
TEK	Traffic Encryption Key
Telnet	A terminal emulation program for TCP/IP networks such as the Internet. The Telnet program runs on your computer and connects your PC to a server on the network.
TGID	Talkgroup ID (16 bit, equivalent to GID). The P25 documents usually use GID but some of the older documents use TGID
Traffic Controller	Software entity which resides in a base station at the site and generates the P25 control channel

TRC	Tone Remote Control
TSBK	Trunking Signaling Block (a 196 bit field in the control channel)
Tx	Transmit
UAC	Unified Audio Card
UAS	Unified Administration Server
UID	Unified ID. This is a Harris specific acronym referring to an ID composed of the System ID and SID. The UID is a ten digit number in the form 604-415-4003, representing region, agency, and individual
Unitrends	Enterprise backup for VIDA networks
UPS	Uninterrupted Power Supply
VAS	VIDA Application Server
VCE	VIDA Console Exchange
VCH	Voice Channel (Phase 2)
VDOC	Voice and Data on Control (the control channel can assign itself as a traffic channel)
VIDA	Voice, Interoperability, Data, Access (a Harris system product)
VME	Versa Module Eurocard (IEEE 1014)
VNIC	Voice Network Interface Controller, the Harris voice switch
VTI	VIDA Telephone Interconnect
WACN	Wide Area Communication Network (20 bit network ID, part of SUID). This is a customer network which can include many VNICs
Zeroize	A P25 control channel command which causes the mobile radio to erase its encryption keys (but then requires manual loading to restore encryption keys)

23. UAS DATA BASE

23.1 Subscriber Units

Region Id	Agency Id	P25 IP Address	OpenSky IP Address	Description	Electronic Serial Number	Protocol Mask	Status	Sub Type	Assigned End User	Algorithm Support
10	998		10.128.111.19	OS_Radio_19	0	OpenSky	Enabled Unit			
10	998		10.128.111.20	OS_Radio_20	0	OpenSky	Enabled Unit			
10	998		10.128.111.2	OS_Radio_02	0	OpenSky	Enabled Unit			
10	998		10.128.111.3	OS_Radio_03	0	OpenSky	Enabled Unit			
10	998		10.128.111.4	OS_Radio_04	0	OpenSky	Enabled Unit			
10	998		10.128.111.5	OS_Radio_05	0	OpenSky	Enabled Unit			
10	998		10.128.111.6	OS_Radio_06	0	OpenSky	Enabled Unit			
10	998		10.128.111.7	OS_Radio_07	0	OpenSky	Enabled Unit			
10	998		10.128.111.8	OS_Radio_08	0	OpenSky	Enabled Unit			
10	998		10.128.111.9	OS_Radio_09	0	OpenSky	Enabled Unit			
10	998		10.128.111.10	OS_Radio_10	0	OpenSky	Enabled Unit			
10	998		10.128.111.11	OS_Radio_11	0	OpenSky	Enabled Unit			

10	998		10.128.111.12	OS_Radio_12	0	OpenSky	Enabled Unit			
10	998		10.128.111.13	OS_Radio_13	0	OpenSky	Enabled Unit			
10	998		10.128.111.14	OS_Radio_14	0	OpenSky	Enabled Unit			
10	998		10.128.111.15	OS_Radio_15	0	OpenSky	Enabled Unit			
10	998		10.128.111.16	OS_Radio_16	0	OpenSky	Enabled Unit			
10	998		10.128.111.1	OS_Radio_1	0	OpenSky	Enabled Unit			
10	998		10.128.111.17	OS_Radio_17	0	OpenSky	Enabled Unit			
10	998		10.128.111.18	OS_Radio_18	0	OpenSky	Enabled Unit			
10	998	10.128.79.9		Radio9	109980009	P25	Enabled Unit	Harris XG-75 Portable	010:998:0009	AES
10	998	10.128.79.10		Radio10	109980010	P25	Enabled Unit	Harris XG-75 Portable	010:998:0010	AES
10	998	10.128.79.8		Radio8	109980008	P25	Enabled Unit	Harris XG-75 Portable	010:998:0008	AES
10	998	10.128.53.1		Console9101	109989101	P25	Enabled Unit	Maestro Console	010:998:9101	AES
10	998	10.128.53.2		Console 9102	109989102	P25	Enabled Unit	Maestro Console	010:998:9102	Both
10	998	10.128.79.1		Radio1	109980001	P25	Enabled Unit	Harris P5400	010:998:0001	AES
10	998	10.128.79.2		Radio2	109980002	P25	Enabled Unit	Harris P5400	010:998:0002	AES
10	998	10.128.79.3		Radio3	109980003	P25	Enabled Unit	Harris XG-75 Portable	010:998:0003	AES
10	998	10.128.79.4		Radio4	109980004	P25	Enabled Unit	Harris XG-75 Portable	010:998:0004	AES

10	998	10.128.79.5	Radio5	109980005	P25	Enabled Unit	Harris XG-75 Portable	010:998:0005	AES
10	998	10.128.79.6	Radio6	109980006	P25	Enabled Unit	Harris XG-75 Portable	010:998:0006	AES
10	998	10.128.79.7	Radio7	109980007	P25	Enabled Unit	Harris XG-75 Portable	010:998:0007	AES
10	998	10.128.79.11	Radio11	109980011	P25	Enabled Unit	Harris UNITY XG-100P	010:998:0011	AES
10	998	10.128.79.12	Radio12	109980012	P25	Enabled Unit	Harris UNITY XG-100P	010:998:0012	AES
10	998	10.128.1.161	s0u1xcda	0	P25	Enabled Unit		010:998:9001	AES
10	998	10.128.1.162	s0u1xcdb	0	P25	Enabled Unit		010:998:9005	AES

23.2 Voice End Users

Region Id	Agency Id	User Id	Name	Description	Personality	User Privilege	Message Trunked ICall	Enable P25 AES OTAR	Manually-Keyed	Preferred Vocoder	Transcoding Allowed Flag
10	998	010:998:9921	VAQ-SS22	SiteSim VAQ User22	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0210	BeOn_210	BeOn_210	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9012	XCD_9012	XCD_9012	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9014	XCD_9014	XCD_9014	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:7005	VTI_7005	VTI_7005	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9909	VAQ-SS10	SiteSim VAQ User10	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9926	VAQ-SS27	SiteSim VAQ User27	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9905	VAQ-SS06	SiteSim VAQ User06	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0202	BeOn_202	BeOn_202	BeOn_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9925	VAQ-SS26	SiteSim VAQ User26	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0015	U9980015	U9980015	OS_Pers	998_10_default	TRUE	FALSE	FALSE	OpenSky 2400 AMBE+2	TRUE

10	998	010:998:00 16	U9980016	U9980016	OS_Pers	998_10_default	TRUE	FALSE	FALSE	OpenSky 2400 AMBE+2	TRUE
10	998	010:998:99 15	VAQ-SS16	SiteSim VAQ User16	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:99 03	VAQ-SS04	SiteSim VAQ User04	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:99 18	VAQ-SS19	SiteSim VAQ User19	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:99 04	VAQ-SS05	SiteSim VAQ User05	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:99 20	VAQ-SS21	SiteSim VAQ User21	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:99 07	VAQ-SS08	SiteSim VAQ User08	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:00 03	U9980003	U9980003	Pers1	998_10_default	TRUE	TRUE	FALSE	P25 Full Rate	TRUE
10	998	010:998:99 19	VAQ-SS20	SiteSim VAQ User20	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:99 11	VAQ-SS12	SiteSim VAQ User12	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:00 17	U9980017	U9980017	OS_Pers	998_10_default	TRUE	FALSE	FALSE	OpenSky 2400 AMBE+2	TRUE
10	998	010:998:00 08	U9980008	U9980008	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:99 01	VAQ-SS02	SiteSim VAQ User02	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE

10	998	010:998:0208	BeOn_208	BeOn_208	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9927	VAQ-SS28	SiteSim VAQ User28	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:7009	VTI_7009	VTI_7009	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9004	XCD_9004	XCD_9004	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9006	XCD_9006	XCD_9006	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9007	XCD_9007	XCD_9007	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0005	U9980005	U9980005	Pers1	998_10_default	TRUE	TRUE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9002	XCD_9002	XCD_9002	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:7002	VTI_7002	VTI_7002	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9906	VAQ-SS07	SiteSim VAQ User07	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9922	VAQ-SS23	SiteSim VAQ User23	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:7001	VTI_7001	VTI_7001	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0207	BeOn_207	BeOn_207	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE

10	998	010:998:9010	XCD_9010	XCD_9010	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9929	VAQ-SS30	SiteSim VAQ User30	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:7004	VTI_7004	VTI_7004	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9018	XCD_9018	XCD_9018	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0013	U9980013	U9980013	OS_Pers	998_10_default	TRUE	FALSE	FALSE	OpenSky 2400 AMBE+2	TRUE
10	998	010:998:7006	VTI_7006	VTI_7006	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9016	XCD_9016	XCD_9016	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9009	XCD_9009	XCD_9009	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:6005	Site5VirtualUser	Site5VirtualUser	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0006	U9980006	U9980006	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9011	XCD_9011	XCD_9011	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9013	XCD_9013	XCD_9013	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0007	U9980007	U9980007	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE

10	998	010:998:0206	BeOn_206	BeOn_206	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9019	XCD_9019	XCD_9019	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9917	VAQ-SS18	SiteSim VAQ User18	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9908	VAQ-SS09	SiteSim VAQ User09	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0004	U9980004	U9980004	Pers1	998_10_default	TRUE	TRUE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9005	XCD_9005	XCD_9005	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9900	VAQ-SS01	SiteSim VAQ User01	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9003	XCD_9003	XCD_9003	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9928	VAQ-SS29	SiteSim VAQ User29	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9923	VAQ-SS24	SiteSim VAQ User24	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0011	U9980011	U9980011	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0010	U9980010	U9980010	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9916	VAQ-SS17	SiteSim VAQ User17	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE

10	998	010:998:9008	XCD_9008	XCD_9008	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9017	XCD_9017	XCD_9017	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0205	BeOn_205	BeOn_205	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0201	BeOn_201	BeOn_201	BeOn_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9001	XCD_9001	XCD_9001	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0209	BeOn_209	BeOn_209	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0204	BeOn_204	BeOn_204	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9914	VAQ-SS15	SiteSim VAQ User15	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9103	U9980003	U9980003	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:7007	VTI_7007	VTI_7007	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:7010	VTI_7010	VTI_7010	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0009	U9980009	U9980009	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9924	VAQ-SS25	SiteSim VAQ User25	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE

10	998	010:998:7008	VTI_7008	VTI_7008	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0002	U9980002	U9980002	Pers1	998_10_default	TRUE	TRUE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0012	U9980012	U9980012	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0014	U9980014	U9980014	OS_Pers	998_10_default	TRUE	FALSE	FALSE	OpenSky 2400 AMBE+2	TRUE
10	998	010:998:9912	VAQ-SS13	SiteSim VAQ User13	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:6003	Site3VirtualUser	Site3VirtualUser	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9902	VAQ-SS03	SiteSim VAQ User03	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0203	BeOn_203	BeOn_203	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9015	XCD_9015	XCD_9015	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9913	VAQ-SS14	SiteSim VAQ User14	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:7003	VTI_7003	VTI_7003	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9910	VAQ-SS11	SiteSim VAQ User11	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:6004	Site4VirtualUser	Site4VirtualUser	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE

10	998	010:998:9101	Cons9101	Console 9101	Pers1	998_10_supervisor	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0001	U9980001	U9980001	Pers1	998_10_supervisor	TRUE	TRUE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9102	Cons9102	Console 9102	Pers1	998_10_supervisor	TRUE	FALSE	FALSE	P25 Full Rate	TRUE

23.3 Talk Groups

TG Id	Region Id	Agency Id	Name	Description	SPNI	Property Id	Priority Id	Coverage	Valid Coverage	Announcement Group	Test Partition Only	Type	Preferred Vocoder	ISSI Site	Transcoding Allowed
9900	10	998	PS-28-AN	VAQ SitSim01	1	3	3	AllRegs:AllSites:AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	Analog/ADPCM		TRUE
9901	10	998	Tone-25	VAQ SitSim02	1	3	3	AllRegs:AllSites:AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
9902	10	998	AmpFreq	VAQ SitSim03	1	3	3	AllRegs:AllSites:AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
9903	10	998	PseudSp	VAQ SitSim04	1	3	3	AllRegs:AllSites:AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
9904	10	998	Phrases	VAQ SitSim05	1	3	3	AllRegs:AllSites:AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
9905	10	998	SiteSm1	VAQ SitSim06	1	3	3	AllRegs:AllSites:AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
9906	10	998	SiteSm2	VAQ SitSim07	1	3	3	AllRegs:AllSites:AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
9907	10	998	SiteSm3	VAQ SitSim08	1	3	3	AllRegs:AllSites:AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE

9908	10	998	SiteSm 4	VAQ SitSim09	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:Al lSites:AllP SAPs	None	FALSE	Genera l	P25 Full Rate		TRUE
9909	10	998	SiteSm 5	VAQ SitSim10	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:Al lSites:AllP SAPs	None	FALSE	Genera l	P25 Full Rate		TRUE
9910	10	998	SiteSm 6	VAQ SitSim11	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:Al lSites:AllP SAPs	None	FALSE	Genera l	P25 Full Rate		TRUE
9911	10	998	T-25-HR	VAQ SitSim12	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:Al lSites:AllP SAPs	None	FALSE	Genera l	P25 Half Rate		TRUE
9912	10	998	AF-HR	VAQ SitSim13	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:Al lSites:AllP SAPs	None	FALSE	Genera l	P25 Half Rate		TRUE
9913	10	998	PSp-HR	VAQ SitSim14	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:Al lSites:AllP SAPs	None	FALSE	Genera l	P25 Half Rate		TRUE
9914	10	998	Phrs-HR	VAQ SitSim15	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:Al lSites:AllP SAPs	None	FALSE	Genera l	P25 Half Rate		TRUE
9915	10	998	T-25-AN	VAQ SitSim16	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:Al lSites:AllP SAPs	None	FALSE	Genera l	Analog/ADP CM		TRUE
9916	10	998	AF-AN	VAQ SitSim17	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:Al lSites:AllP SAPs	None	FALSE	Genera l	Analog/ADP CM		TRUE
9917	10	998	P-Sp-AN	VAQ SitSim18	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:Al lSites:AllP SAPs	None	FALSE	Genera l	Analog/ADP CM		TRUE

9918	10	998	Phrs-AN	VAQ SitSim19	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	Analog/ADPCM		TRUE
9919	10	998	VAQ20	VAQ SitSim20	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
9920	10	998	DVSITV	VAQ SitSim21	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Half Rate		TRUE
9921	10	998	T-25OS	VAQ SitSim22	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE		TRUE
9922	10	998	AF-OS	VAQ SitSim23	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE		TRUE
9923	10	998	P-SpOS	VAQ SitSim24	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE		TRUE
9924	10	998	PhrsOS	VAQ SitSim25	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE		TRUE
9925	10	998	T-25OS2	VAQ SitSim26	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE+2		TRUE
9926	10	998	AF-OS2	VAQ SitSim27	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE		TRUE
9927	10	998	P-SpOS2	VAQ SitSim28	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE+2		TRUE

9928	10	998	PhrsOS 2	VAQ SitSim29	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE+2		TRUE
9929	10	998	VAQ30	VAQ SitSim30	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
64000	10	998	64000 ALL	TG64000 P25 Full Rate All Call	1	3	7	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	All-Call	P25 Full Rate		FALSE
64001	10	998	64001 TUL	TG64001 P25 Full Rate TX Unconf Low Priority	1	3	3	P25Sites_PSAPs	P25Sites_PSAPs	64007:64007ANN	FALSE	General	P25 Full Rate	010:Region 10--111:ISSI_SITE	TRUE
64002	10	998	64002 TUM	TG64002 P25 Full Rate TX Unconf Med Priority	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	64007:64007ANN	FALSE	General	P25 Full Rate	010:Region 10--111:ISSI_SITE	TRUE
64003	10	998	64003 TUM	TG64003 P25 Full Rate TX Unconf Med Priority	1	5	5	P25Sites_PSAPs	P25Sites_PSAPs	64007:64007ANN	FALSE	General	P25 Full Rate	010:Region 10--111:ISSI_SITE	TRUE
64004	10	998	64004 TUM	TG64004 P25 Full Rate TX Unconf Med Priority	1	4	5	P25Sites_PSAPs	P25Sites_PSAPs	64007:64007ANN	FALSE	General	P25 Full Rate	010:Region 10--111:ISSI_SITE	TRUE

64005	10	998	64005 TUM	TG64005 P25 Full Rate Msg Unconf Med Priority	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	64007:64007ANN	FALSE	General	P25 Full Rate	010:Region 10--111:ISSI_SITE	TRUE
64006	10	998	64006 TUH	TG64006 P25 Full Rate Msg Unconf High Priority	1	3	6	P25Sites_PSAPs	P25Sites_PSAPs	64007:64007ANN	FALSE	General	P25 Full Rate		TRUE
64007	10	998	64007 ANN	TG64007 P25 Full Rate Announcement	1	3	6	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	Announcement	P25 Full Rate		TRUE
64051	10	998	64051 TUL	TG64051 P25 Half Rate Low Priority	1	3	3	P25Sites_PSAPs	P25Sites_PSAPs	64057:64057ANN	FALSE	General	P25 Half Rate		TRUE
64052	10	998	64052 TUM	TG64052 P25 Half Rate Med Priority	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	64057:64057ANN	FALSE	General	P25 Half Rate		TRUE
64053	10	998	64053 TUM	TG64053 P25 Half Rate Med Priority	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	64057:64057ANN	FALSE	General	P25 Half Rate		TRUE
64054	10	998	64054 TUM	TG64054 P25 Half Rate Med Priority	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	64057:64057ANN	FALSE	General	P25 Half Rate		TRUE

64055	10	998	64055 TUM	TG64055 P25 Half Rate Med Priority	1	3	5	P25Sites _PSAPs	P25Sites_ PSAPs	64057:64057ANN	FALSE	General	P25 Half Rate		TRUE
64056	10	998	64056 TUH	TG64056 P25 Half Rate High Priority	1	3	6	P25Sites _PSAPs	P25Sites_ PSAPs	64057:64057ANN	FALSE	General	P25 Half Rate		TRUE
64057	10	998	64057 ANN	TG64057 P25 Half Rate Announcement	1	3	6	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	Announcement	P25 Half Rate		FALSE
64100	10	998	64100 ALL	TG64100 P25 Full Rate All Call	1	3	7	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	All-Call	P25 Full Rate		FALSE
64101	10	998	64101 TCL	TG64101 P25 Full Rate Conf Low Priority	1	4	3	P25Sites _PSAPs	P25Sites_ PSAPs	64107:64107ANN	FALSE	General	P25 Full Rate		TRUE
64102	10	998	64102 TCM	TG64102 P25 Full Rate Conf Med Priority	1	4	5	P25Sites _PSAPs	P25Sites_ PSAPs	64107:64107ANN	FALSE	General	P25 Full Rate		TRUE
64103	10	998	64103 TCM	TG64103 P25 Full Rate Conf Med Priority	1	4	5	P25Sites _PSAPs	P25Sites_ PSAPs	64107:64107ANN	FALSE	General	P25 Full Rate		TRUE
64104	10	998	64104 TCM	TG64104 P25 Full Rate Conf Med Priority	1	4	5	P25Sites _PSAPs	P25Sites_ PSAPs	64107:64107ANN	FALSE	General	P25 Full Rate		TRUE

64105	10	998	64105 TCM	TG64105 P25 Full Rate Conf Med Priority	1	4	5	P25Sites _PSAPs	P25Sites_ PSAPs	64107:64107ANN	FALSE	General	P25 Full Rate		TRUE
64106	10	998	64106 TCH	TG64106 P25 Full Rate Conf High Priority	1	4	6	P25Sites _PSAPs	P25Sites_ PSAPs	64107:64107ANN	FALSE	General	P25 Full Rate		TRUE
64107	10	998	64107 ANN	TG64107 P25 Full Rate Announcement	1	4	6	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	Announcement	P25 Full Rate		TRUE
64151	10	998	64151 TCL	TG64151 P25 Half Rate Low Priority	1	4	3	P25Sites _PSAPs	P25Sites_ PSAPs	64157:64157ANN	FALSE	General	P25 Half Rate		TRUE
64152	10	998	64152 TCM	TG64152 P25 Half Rate Med Priority	1	4	5	P25Sites _PSAPs	P25Sites_ PSAPs	64157:64157ANN	FALSE	General	P25 Half Rate		TRUE
64153	10	998	64153 TCM	TG64153 P25 Half Rate Med Priority	1	4	5	P25Sites _PSAPs	P25Sites_ PSAPs	64157:64157ANN	FALSE	General	P25 Half Rate		TRUE
64154	10	998	64154 TCM	TG64154 P25 Half Rate Med Priority	1	4	5	P25Sites _PSAPs	P25Sites_ PSAPs	64157:64157ANN	FALSE	General	P25 Half Rate		TRUE
64155	10	998	64155 TCM	TG64155 P25 Half Rate Med Priority	1	4	5	P25Sites _PSAPs	P25Sites_ PSAPs	64157:64157ANN	FALSE	General	P25 Half Rate		TRUE

64156	10	998	64156 TCH	TG64156 P25 Half Rate High Priority	1	4	6	P25Sites _PSAPs	P25Sites_ PSAPs	64157:64157ANN	FALSE	General	P25 Half Rate		TRUE
64157	10	998	64157 ANN	TG64157 P25 Half Rate Announcement	1	4	6	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	Announcement	P25 Half Rate		FALSE
64201	10	998	64201 TUE	TG64201 P25 Full Rate Unconf Encrypted	1	3	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	P25 Full Rate		TRUE
64202	10	998	64202 TUE	TG64202 P25 Full Rate Unconf Encrypted	1	3	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	P25 Full Rate		TRUE
64203	10	998	64203 TCE	TG64203 P25 Full Rate Conf Encrypted	1	4	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	P25 Full Rate		TRUE
64204	10	998	64204 TCE	TG64204 P25 Full Rate Conf Encrypted	1	4	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	P25 Full Rate		TRUE
64251	10	998	64251 TUE	TG64251 P25 Half Rate Unconf Encrypted	1	3	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	P25 Half Rate		TRUE
64252	10	998	64252 TUE	TG64252 P25 Half Rate Unconf Encrypted	1	3	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	P25 Half Rate		TRUE

64253	10	998	64253 TCE	TG64253 P25 Half Rate Conf Encrypted	1	4	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	P25 Half Rate		TRUE
64254	10	998	64254 TCE	TG64254 P25 Half Rate Conf Encrypted	1	4	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	P25 Half Rate		TRUE
64301	10	998	64301 MUM	TG64301 P25 Full Rate MT Unconf Med Priority	1	5	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	P25 Full Rate		TRUE
64302	10	998	64302 MUM	TG64302 P25 Full Rate MT Unconf Med Priority	1	5	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	P25 Full Rate		TRUE
64303	10	998	64303 MUM	TG64303 P25 Full Rate MT Unconf Med Priority	1	5	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	P25 Full Rate		TRUE
64304	10	998	64304 MUM	TG64304 P25 Full Rate MT Unconf Med Priority	1	5	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	P25 Full Rate		TRUE
64305	10	998	64305 MCM	TG64305 P25 Full Rate MT Conf Med Priority	1	6	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	P25 Full Rate		TRUE

64306	10	998	64306 MCM	TG64306 P25 Full Rate MT Conf Med Priority	1	6	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	Genera l	P25 Full Rate		TRUE
64307	10	998	64307 MCM	TG64307 P25 Full Rate MT Conf Med Priority	1	6	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	Genera l	P25 Full Rate		TRUE
64308	10	998	64308 MCM	TG64308 P25 Full Rate MT Conf Med Priority	1	6	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	Genera l	P25 Full Rate		TRUE
64351	10	998	64351 MUM	TG64351 P25 Half Rate MT Unconf Med Priority	1	5	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	Genera l	P25 Half Rate		TRUE
64352	10	998	64352 MUM	TG64352 P25 Half Rate MT Unconf Med Priority	1	5	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	Genera l	P25 Half Rate		TRUE
64353	10	998	64353 MUM	TG64353 P25 Half Rate MT Unconf Med Priority	1	5	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	Genera l	P25 Half Rate		TRUE
64354	10	998	64354 MUM	TG64354 P25 Half Rate MT	1	5	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	Genera l	P25 Half Rate		TRUE

				Unconf Med Priority											
64355	10	998	64355 MCM	TG64355 P25 Half Rate MT Conf Med Priority	1	6	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	P25 Half Rate		TRUE
64356	10	998	64356 MCM	TG64356 P25 Half Rate MT Conf Med Priority	1	6	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	P25 Half Rate		TRUE
64357	10	998	64357 MCM	TG64357 P25 Half Rate MT Conf Med Priority	1	6	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	P25 Half Rate		TRUE
64358	10	998	64358 MCM	TG64358 P25 Half Rate MT Conf Med Priority	1	6	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	P25 Half Rate		TRUE
64400	10	998	64400 OSTUH	TG64400 OS AMBE TX Unconf High Priority	1	3	6	AllRegs:AllSites:AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE+2		TRUE
64401	10	998	64401 OSTUM	TG64401 OS AMBE TX Unconf Med Priority	1	3	5	AllRegs:AllSites:AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE+2		TRUE
64402	10	998	64402 OSTUM	TG64402 OS AMBE TX	1	3	5	AllRegs:AllSites:AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE+2		TRUE

				Unconf Med Priority											
64403	10	998	64403 OSTUM	TG64403 OS AMBE MT Unconf Med Priority	1	5	5	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE+2		TRUE
64404	10	998	64404 OSTUL	TG64404 OS AMBE TX Unconf Low Priority	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE+2		TRUE
64450	10	998	64450 ANA	TG64450 Analog ADPCM Med Priority	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	IP Console Intercom	Analog/ADPCM		TRUE
64451	10	998	64451 ANA	TG64451 Analog ADPCM Med Priority	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	Analog/ADPCM		TRUE
64452	10	998	64452 ANA	TG64452 Analog ADPCM Med Priority	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	Analog/ADPCM		TRUE
64453	10	998	64453 ANA	TG64453 Analog ADPCM Med Priority	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	Analog/ADPCM		TRUE
9900	10	998	PS-28-AN	VAQ SitSim01	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	Analog/ADPCM		TRUE

9901	10	998	Tone-25	VAQSitSim02	1	3	3	AllRegs:AllSites:AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
9902	10	998	AmpFreq	VAQSitSim03	1	3	3	AllRegs:AllSites:AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
9903	10	998	PseudSp	VAQSitSim04	1	3	3	AllRegs:AllSites:AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
9904	10	998	Phrases	VAQSitSim05	1	3	3	AllRegs:AllSites:AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
9905	10	998	SiteSm1	VAQSitSim06	1	3	3	AllRegs:AllSites:AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
9906	10	998	SiteSm2	VAQSitSim07	1	3	3	AllRegs:AllSites:AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
9907	10	998	SiteSm3	VAQSitSim08	1	3	3	AllRegs:AllSites:AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
9908	10	998	SiteSm4	VAQSitSim09	1	3	3	AllRegs:AllSites:AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
9909	10	998	SiteSm5	VAQSitSim10	1	3	3	AllRegs:AllSites:AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
9910	10	998	SiteSm6	VAQSitSim11	1	3	3	AllRegs:AllSites:AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE

9911	10	998	T-25-HR	VAQ SitSim12	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Half Rate		TRUE
9912	10	998	AF-HR	VAQ SitSim13	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Half Rate		TRUE
9913	10	998	PSp-HR	VAQ SitSim14	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Half Rate		TRUE
9914	10	998	Phrs-HR	VAQ SitSim15	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Half Rate		TRUE
9915	10	998	T-25-AN	VAQ SitSim16	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	Analog/ADPCM		TRUE
9916	10	998	AF-AN	VAQ SitSim17	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	Analog/ADPCM		TRUE
9917	10	998	P-Sp-AN	VAQ SitSim18	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	Analog/ADPCM		TRUE
9918	10	998	Phrs-AN	VAQ SitSim19	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	Analog/ADPCM		TRUE
9919	10	998	VAQ20	VAQ SitSim20	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
9920	10	998	DVSITV	VAQ SitSim21	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Half Rate		TRUE

9921	10	998	T-25OS	VAQ SitSim22	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE		TRUE
9922	10	998	AF-OS	VAQ SitSim23	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE		TRUE
9923	10	998	P-SpOS	VAQ SitSim24	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE		TRUE
9924	10	998	PhrsOS	VAQ SitSim25	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE		TRUE
9925	10	998	T-25OS2	VAQ SitSim26	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE+2		TRUE
9926	10	998	AF-OS2	VAQ SitSim27	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE		TRUE
9927	10	998	P-SpOS2	VAQ SitSim28	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE+2		TRUE
9928	10	998	PhrsOS 2	VAQ SitSim29	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE+2		TRUE
9929	10	998	VAQ30	VAQ SitSim30	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
64000	10	998	64000 ALL	TG64000 P25 Full Rate All Call	1	3	7	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	All-Call	P25 Full Rate		FALSE

64001	10	998	64001 TUL	TG64001 TG64001 P25 Full Rate TX Unconf Low Priority	1	3	3	P25Sites _PSAPs	P25Sites_ PSAPs	64007:64007ANN	FALSE	General	P25 Full Rate	010:Region 10--111:ISSI_SITE	TRUE
64002	10	998	64002 TUM	TG64002 P25 Full Rate TX Unconf Med Priority	1	3	5	P25Sites _PSAPs	P25Sites_ PSAPs	64007:64007ANN	FALSE	General	P25 Full Rate	010:Region 10--111:ISSI_SITE	TRUE
64003	10	998	64003 TUM	TG64003 P25 Full Rate TX Unconf Med Priority	1	5	5	P25Sites _PSAPs	P25Sites_ PSAPs	64007:64007ANN	FALSE	General	P25 Full Rate	010:Region 10--111:ISSI_SITE	TRUE
64004	10	998	64004 TUM	TG64004 P25 Full Rate TX Unconf Med Priority	1	4	5	P25Sites _PSAPs	P25Sites_ PSAPs	64007:64007ANN	FALSE	General	P25 Full Rate	010:Region 10--111:ISSI_SITE	TRUE
64005	10	998	64005 TUM	TG64005 P25 Full Rate Msg Unconf Med Priority	1	3	5	P25Sites _PSAPs	P25Sites_ PSAPs	64007:64007ANN	FALSE	General	P25 Full Rate	010:Region 10--111:ISSI_SITE	TRUE
64006	10	998	64006 TUH	TG64006 P25 Full Rate Msg Unconf High Priority	1	3	6	P25Sites _PSAPs	P25Sites_ PSAPs	64007:64007ANN	FALSE	General	P25 Full Rate		TRUE

64007	10	998	64007 ANN	TG64007 P25 Full Rate Announcement	1	3	6	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	Announcement	P25 Full Rate		TRUE
64051	10	998	64051 TUL	TG64051 P25 Half Rate Low Priority	1	3	3	P25Sites_PSAPs	P25Sites_PSAPs	64057:64057ANN	FALSE	General	P25 Half Rate		TRUE
64052	10	998	64052 TUM	TG64052 P25 Half Rate Med Priority	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	64057:64057ANN	FALSE	General	P25 Half Rate		TRUE
64053	10	998	64053 TUM	TG64053 P25 Half Rate Med Priority	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	64057:64057ANN	FALSE	General	P25 Half Rate		TRUE
64054	10	998	64054 TUM	TG64054 P25 Half Rate Med Priority	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	64057:64057ANN	FALSE	General	P25 Half Rate		TRUE
64055	10	998	64055 TUM	TG64055 P25 Half Rate Med Priority	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	64057:64057ANN	FALSE	General	P25 Half Rate		TRUE
64056	10	998	64056 TUH	TG64056 P25 Half Rate High Priority	1	3	6	P25Sites_PSAPs	P25Sites_PSAPs	64057:64057ANN	FALSE	General	P25 Half Rate		TRUE
64057	10	998	64057 ANN	TG64057 P25 Half Rate	1	3	6	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	Announcement	P25 Half Rate		FALSE

				Announcement											
64100	10	998	64100 ALL	TG64100 P25 Full Rate All Call	1	3	7	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	All-Call	P25 Full Rate		FALSE
64101	10	998	64101 TCL	TG64101 P25 Full Rate Conf Low Priority	1	4	3	P25Sites_PSAPs	P25Sites_PSAPs	64107:64107ANN	FALSE	General	P25 Full Rate		TRUE
64102	10	998	64102 TCM	TG64102 P25 Full Rate Conf Med Priority	1	4	5	P25Sites_PSAPs	P25Sites_PSAPs	64107:64107ANN	FALSE	General	P25 Full Rate		TRUE
64103	10	998	64103 TCM	TG64103 P25 Full Rate Conf Med Priority	1	4	5	P25Sites_PSAPs	P25Sites_PSAPs	64107:64107ANN	FALSE	General	P25 Full Rate		TRUE
64104	10	998	64104 TCM	TG64104 P25 Full Rate Conf Med Priority	1	4	5	P25Sites_PSAPs	P25Sites_PSAPs	64107:64107ANN	FALSE	General	P25 Full Rate		TRUE
64105	10	998	64105 TCM	TG64105 P25 Full Rate Conf Med Priority	1	4	5	P25Sites_PSAPs	P25Sites_PSAPs	64107:64107ANN	FALSE	General	P25 Full Rate		TRUE
64106	10	998	64106 TCH	TG64106 P25 Full Rate Conf High Priority	1	4	6	P25Sites_PSAPs	P25Sites_PSAPs	64107:64107ANN	FALSE	General	P25 Full Rate		TRUE
64107	10	998	64107 ANN	TG64107 P25 Full Rate	1	4	6	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	Announcement	P25 Full Rate		TRUE

				Announcement											
64151	10	998	64151 TCL	TG64151 P25 Half Rate Low Priority	1	4	3	P25Sites_PSAPs	P25Sites_PSAPs	64157:64157ANN	FALSE	General	P25 Half Rate		TRUE
64152	10	998	64152 TCM	TG64152 P25 Half Rate Med Priority	1	4	5	P25Sites_PSAPs	P25Sites_PSAPs	64157:64157ANN	FALSE	General	P25 Half Rate		TRUE
64153	10	998	64153 TCM	TG64153 P25 Half Rate Med Priority	1	4	5	P25Sites_PSAPs	P25Sites_PSAPs	64157:64157ANN	FALSE	General	P25 Half Rate		TRUE
64154	10	998	64154 TCM	TG64154 P25 Half Rate Med Priority	1	4	5	P25Sites_PSAPs	P25Sites_PSAPs	64157:64157ANN	FALSE	General	P25 Half Rate		TRUE
64155	10	998	64155 TCM	TG64155 P25 Half Rate Med Priority	1	4	5	P25Sites_PSAPs	P25Sites_PSAPs	64157:64157ANN	FALSE	General	P25 Half Rate		TRUE
64156	10	998	64156 TCH	TG64156 P25 Half Rate High Priority	1	4	6	P25Sites_PSAPs	P25Sites_PSAPs	64157:64157ANN	FALSE	General	P25 Half Rate		TRUE
64157	10	998	64157 ANN	TG64157 P25 Half Rate Announcement	1	4	6	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	Announcement	P25 Half Rate		FALSE

64201	10	998	64201 TUE	TG64201 P25 Full Rate Unconf Encrypted	1	3	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	P25 Full Rate		TRUE
64202	10	998	64202 TUE	TG64202 P25 Full Rate Unconf Encrypted	1	3	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	P25 Full Rate		TRUE
64203	10	998	64203 TCE	TG64203 P25 Full Rate Conf Encrypted	1	4	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	P25 Full Rate		TRUE
64204	10	998	64204 TCE	TG64204 P25 Full Rate Conf Encrypted	1	4	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	P25 Full Rate		TRUE
64251	10	998	64251 TUE	TG64251 P25 Half Rate Unconf Encrypted	1	3	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	P25 Half Rate		TRUE
64252	10	998	64252 TUE	TG64252 P25 Half Rate Unconf Encrypted	1	3	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	P25 Half Rate		TRUE
64253	10	998	64253 TCE	TG64253 P25 Half Rate Conf Encrypted	1	4	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	P25 Half Rate		TRUE
64254	10	998	64254 TCE	TG64254 P25 Half Rate Conf Encrypted	1	4	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	P25 Half Rate		TRUE

64301	10	998	64301 MUM	TG64301 P25 Full Rate MT Unconf Med Priority	1	5	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	Genera l	P25 Full Rate		TRUE
64302	10	998	64302 MUM	TG64302 P25 Full Rate MT Unconf Med Priority	1	5	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	Genera l	P25 Full Rate		TRUE
64303	10	998	64303 MUM	TG64303 P25 Full Rate MT Unconf Med Priority	1	5	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	Genera l	P25 Full Rate		TRUE
64304	10	998	64304 MUM	TG64304 P25 Full Rate MT Unconf Med Priority	1	5	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	Genera l	P25 Full Rate		TRUE
64305	10	998	64305 MCM	TG64305 P25 Full Rate MT Conf Med Priority	1	6	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	Genera l	P25 Full Rate		TRUE
64306	10	998	64306 MCM	TG64306 P25 Full Rate MT Conf Med Priority	1	6	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	Genera l	P25 Full Rate		TRUE
64307	10	998	64307 MCM	TG64307 P25 Full Rate MT	1	6	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	Genera l	P25 Full Rate		TRUE

				Conf Med Priority											
64308	10	998	64308 MCM	TG64308 P25 Full Rate MT Conf Med Priority	1	6	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	Genera l	P25 Full Rate		TRUE
64351	10	998	64351 MUM	TG64351 P25 Half Rate MT Unconf Med Priority	1	5	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	Genera l	P25 Half Rate		TRUE
64352	10	998	64352 MUM	TG64352 P25 Half Rate MT Unconf Med Priority	1	5	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	Genera l	P25 Half Rate		TRUE
64353	10	998	64353 MUM	TG64353 P25 Half Rate MT Unconf Med Priority	1	5	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	Genera l	P25 Half Rate		TRUE
64354	10	998	64354 MUM	TG64354 P25 Half Rate MT Unconf Med Priority	1	5	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	Genera l	P25 Half Rate		TRUE
64355	10	998	64355 MCM	TG64355 P25 Half Rate MT Conf Med Priority	1	6	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	Genera l	P25 Half Rate		TRUE

64356	10	998	64356 MCM	TG64356 P25 Half Rate MT Conf Med Priority	1	6	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	P25 Half Rate		TRUE
64357	10	998	64357 MCM	TG64357 P25 Half Rate MT Conf Med Priority	1	6	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	P25 Half Rate		TRUE
64358	10	998	64358 MCM	TG64358 P25 Half Rate MT Conf Med Priority	1	6	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	P25 Half Rate		TRUE
64400	10	998	64400 OSTUH	TG64400 OS AMBE TX Unconf High Priority	1	3	6	AllRegs:AllSites:AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE+2		TRUE
64401	10	998	64401 OSTUM	TG64401 OS AMBE TX Unconf Med Priority	1	3	5	AllRegs:AllSites:AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE+2		TRUE
64402	10	998	64402 OSTUM	TG64402 OS AMBE TX Unconf Med Priority	1	3	5	AllRegs:AllSites:AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE+2		TRUE
64403	10	998	64403 OSTUM	TG64403 OS AMBE MT Unconf Med Priority	1	5	5	AllRegs:AllSites:AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE+2		TRUE

64404	10	998	64404 OSTUL	TG64404 OS AMBE TX Unconf Low Priority	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE+2		TRUE
64450	10	998	64450 ANA	TG64450 Analog ADPCM Med Priority	1	3	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	IP Console Intercom	Analog/ADPCM		TRUE
64451	10	998	64451 ANA	TG64451 Analog ADPCM Med Priority	1	3	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	Analog/ADPCM		TRUE
64452	10	998	64452 ANA	TG64452 Analog ADPCM Med Priority	1	3	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	Analog/ADPCM		TRUE
64453	10	998	64453 ANA	TG64453 Analog ADPCM Med Priority	1	3	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	Analog/ADPCM		TRUE

23.4 PSAPs

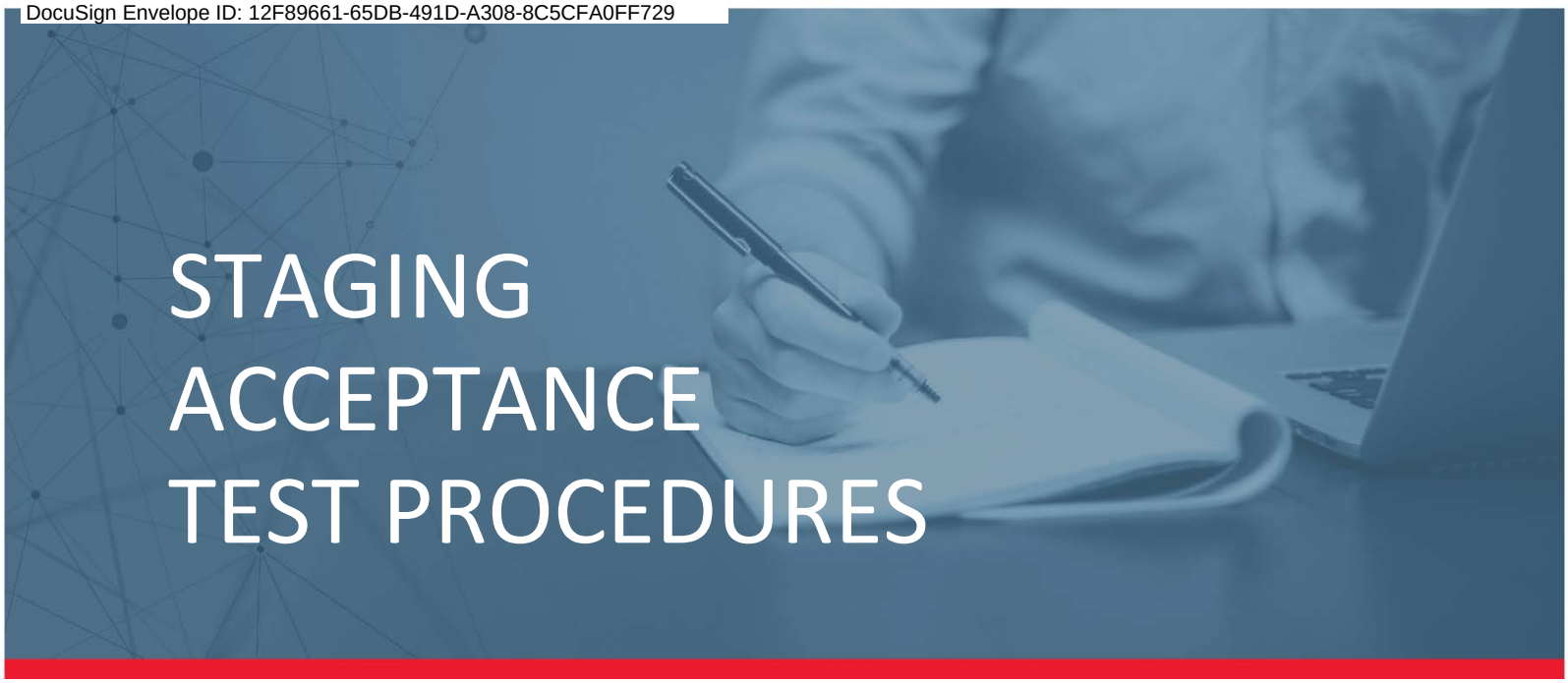
Region Id	Agency Id	PSAP Id	Device Id	Name	Description	Max Talk Paths	Service Type
10	998	9101	1	Console9101	Console9101	7	IP Console
10	998	9102	1	Console9102	Console9102	7	IP Console
10	998	7001	1	VTI7001	VTI7001	16	VTI
10	998	7002	1	VTI7002	VTI7002	16	VTI
10	998	9103	1	Console9103	Console9103	7	IP Console
10	998	9104	1	Console9104	Console9104	7	IP Console
10	998	9105	1	Console9105	Console9105	7	IP Console
10	998	9106	1	Console9106	Console9106	7	IP Console
10	998	9107	1	Console9107	Console9107	7	IP Console
10	998	9108	1	Console9108	Console9108	7	IP Console
10	998	9109	1	Console9109	Console9109	7	IP Console
10	998	9110	1	Console9110	Console9110	7	IP Console

Region Id	Agency Id	P25 IP Address	OpenSky IP Address	Description	Electronic Serial Number	Protocol Mask	Status	Sub Type	Assigned End User	Algorithm Support
10	998		10.128.111.19	OS_Radio_19	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.20	OS_Radio_20	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.2	OS_Radio_02	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.3	OS_Radio_03	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.4	OS_Radio_04	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.5	OS_Radio_05	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.6	OS_Radio_06	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.7	OS_Radio_07	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.8	OS_Radio_08	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.9	OS_Radio_09	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.10	OS_Radio_10	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.11	OS_Radio_11	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.12	OS_Radio_12	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.13	OS_Radio_13	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.14	OS_Radio_14	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.15	OS_Radio_15	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.16	OS_Radio_16	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.1	OS_Radio_1	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.17	OS_Radio_17	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.18	OS_Radio_18	0000000000000000	OpenSky	Enabled Unit			
10	998	10.128.79.9		Radio9	0000000109980009	P25	Enabled Unit	Harris XG-75 Portable	010:998:0009	AES
10	998	10.128.79.10		Radio10	0000000109980010	P25	Enabled Unit	Harris XG-75 Portable	010:998:0010	AES
10	998	10.128.79.8		Radio8	0000000109980008	P25	Enabled Unit	Harris XG-75 Portable	010:998:0008	AES
10	998	10.128.53.1		Console9101	0000000109989101	P25	Enabled Unit	Maestro Console	010:998:9101	AES
10	998	10.128.53.2		Console 9102	0000000109989102	P25	Enabled Unit	Maestro Console	010:998:9102	Both
10	998	10.128.79.1		Radio1	0000000109980001	P25	Enabled Unit	Harris P5400	010:998:0001	AES

10	998	10.128.79.2	Radio2	0000000109980002	P25	Enabled Unit	Harris P5400	010:998:0002	AES
10	998	10.128.79.3	Radio3	0000000109980003	P25	Enabled Unit	Harris XG-75 Portable	010:998:0003	AES
10	998	10.128.79.4	Radio4	0000000109980004	P25	Enabled Unit	Harris XG-75 Portable	010:998:0004	AES
10	998	10.128.79.5	Radio5	0000000109980005	P25	Enabled Unit	Harris XG-75 Portable	010:998:0005	AES
10	998	10.128.79.6	Radio6	0000000109980006	P25	Enabled Unit	Harris XG-75 Portable	010:998:0006	AES
10	998	10.128.79.7	Radio7	0000000109980007	P25	Enabled Unit	Harris XG-75 Portable	010:998:0007	AES
10	998	10.128.79.11	Radio11	0000000109980011	P25	Enabled Unit	Harris UNITY XG-100P	010:998:0011	AES
10	998	10.128.79.12	Radio12	0000000109980012	P25	Enabled Unit	Harris UNITY XG-100P	010:998:0012	AES
10	998	10.128.1.161	s0u1xcda	0000000000000000	P25	Enabled Unit		010:998:9001	AES
10	998	10.128.1.162	s0u1xcdb	0000000000000000	P25	Enabled Unit		010:998:9005	AES

24. Action Items

Test #	Page #	Action/Issue	Date Resolved	Resolution



STAGING ACCEPTANCE TEST PROCEDURES

ABOUT THIS DOCUMENT

This document was specifically prepared for the customer shown below. Each section of this document is individually maintained in the Harris document control system.

Customer: Nevada Department of Transportation

Prepared By: Smitha Paramashivan

DOCUMENT USAGE

Many of the tests in this document will need to be run on multiple pieces of equipment. For tests that need to be run multiple times, log in the comment section of the result box the identifier of the equipment tested. Although specific tests are not included relating to electrical measurements or timing parameters of equipment, these tests and levels are conducted and recorded as part of Harris' standard production and/or installation practices. These parameters include but are not limited to:

- Transmit Frequency and Deviation
- Output and Reflected Power
- Receiver Sensitivity
- Receiver Multicoupler Gain (if applicable)
- Receiver Preamplifier Gain (if applicable)
- Combiner Loss (if applicable)
- Audio line out
- Audio line in

SUBSCRIBER UNIT USAGE

All tests for subscriber (terminal) units in this document will be performed with Harris subscriber units unless the test setup identifies another Vendor's subscriber unit to be used.

1. CUSTOMER APPROVAL

These Test Procedures have been read and approved for use as the Staging Acceptance Test.

Customer Representative	Harris Corporation Representative
Signature and Date	Signature and Date
Printed name and title	Printed name and title

2. SYSTEM ACCEPTANCE

This Acceptance Test Procedure has been fully and successfully completed with all action items resolved.

Customer Representative	**Harris Corporation Representative**
Signature	Signature
Printed name and title	Printed name and title
Date	Date

FUNCTIONAL TESTING CLARIFICATION

Equipment inspection and testing in addition to staging acceptance testing is performed at the Harris staging facility. Staging tests as detailed in this matrix verify basic equipment functionality in addition to its functionality as part of an overall system. Equipment as received from Harris and third party manufacturing suppliers is supplied with manufacturer test results, as applicable. Test results documentation will be that from the staging acceptance tests. Equipment tests will be performed in the field after installation both as part of equipment commissioning and overall final functional acceptance testing. Test results documentation will be from the final functional acceptance tests.

3. VIDA UNIVERSAL ADMINISTRATION SERVER (UAS)

3.1 Create an Agency Level Administrator Account in the UAS

Purpose: **Demonstrate the capability to create Agency Admin Accounts in the UAS.**

Expected Results: **This test will create a new Agency Level Administrator account.**

Setup: **Need system level access to an UAS or UAS Client. Predefined Agency and Region in the UAS.**

Execution:

1. Browse to the UAS at the address of 'https://s0u1uas.vida.local:8443/nas'
2. Log in with UAS administrator level account.
   - Verify that default accounts are created (see list below) and verify a default Agency administrative class, by selecting System/Administration/Admin User.
3. Select "Add" to display the Administration User Detail screen.
4. Enter a name (e.g., TestAgency), description, and password. Select save to download, and click 'OK'.
5. Log out of the default account.
6. Log in with the newTestAgencyAdmin. Verify access to account.
   - Verify access to account.
7. Log out of the Test AgencyAdmin.
8. Log in with the default account and delete the TestAgencyAdmin.

Admin User	Admin Class	Description
agency998	Agency998	Agency 998 Access
Vida	RSA	RSA
ProvTool	RSA	Provtool
vida2	RSA	vida2
Hp	RSA	Hao for Testing
Provtool2	RSA	Provtool
Provtool3	RSA	Provtool
Provtool4	RSA	Provtool
Kc	RSA	Kc

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

3.2 Provision Agency with Talk Groups and Subscriber Units in the UAS

Purpose: **Demonstrate the capability to add talk-groups and users to the Agency accounts in the UAS.**

Expected Results: **This test will show that a user can add a new talk group and users to the system.**

Setup: **System/Region/Agency level access to the UAS or a UAS client.**

Talk Groups				
Name	Description	SPNI	Property Id	Priority Id
64000ALL	TG64000 P25	Full Rate All Call	1	3
64100ALL	TG64100 P25	Full Rate All Call	1	3
64101TCL	TG64101 P25	Full Rate Conf Med Priority	1	4
64102TCM	TG64102 P25	Full Rate Conf Med Priority	1	4
64103TCM	TG64103 P25	Full Rate Conf Med Priority	1	4
64104TCM	TG64104 P25	Full Rate Conf Med Priority	1	4
64105TCM	TG64105 P25	Full Rate Conf Med Priority	1	4
64106TCH	TG64106 P25	P25 Full Rate Conf High Priority	1	4

Radios						
Description	RSI	Protocol Mask	Status	Sub Type	Assigned End User	Algorithm Support
Radio1	9980001	P25	Enabled Unit	Harris P5400	010:998:0001	AES
Radio2	9980002	P25	Enabled Unit	Harris P5400	010:998:0002	AES
Radio3	9980003	P25	Enabled Unit	Harris XG-75 Portable	010:998:0003	AES
Radio4	9980004	P25	Enabled Unit	Harris XG-75 Portable	010:998:0004	AES
Console9101	9989101	P25	Enabled Unit	Maestro Console	010:998:9101	AES

Radio5	9980005	P25	Enabled Unit	Harris XG-75 Portable	010:998:0005	AES
Radio6	9980006	P25	Enabled Unit	Harris XG-75 Portable	010:998:0006	AES
Radio7	9980007	P25	Enabled Unit	Harris XG-75 Portable	010:998:0007	AES
Radio8	9980008	P25	Enabled Unit	Harris XG-75 Portable	010:998:0008	AES
Radio9	9980009	P25	Enabled Unit	Harris XG-75 Portable	010:998:0009	AES
Radio10	9980010	P25	Enabled Unit	Harris XG-75 Portable	010:998:0010	AES

Execution:

1. Log into the UAS with one of the default accounts.

2. Under Agency 998, create a talk group by select ‘R/W Talk Group’, select Agency/ “agency name”/ R/W Talk Group.

3. Click ‘Add’ and then on the Talkgroup Detail screen input the TG ID in the table below. All setting not listed use auto setting for setting not listed. Click OK and download.

   - Verify the talk group has been added to the list of Talkgroups

4. Using Putty on an SMT, log into a traffic controller at each control point for simulcast and each site for multisite and issue the command ‘show gdb’

   - Verify that group 64454 exits in the traffic controller user data base.

5. Once the group has been verified, delete it from the UAS.

TG Id	Name	Description	SPNI	Property Id
64454	64454ANA	Half Rate Low Priority	1	3

Priority Id	Coverage	Valid Coverage
5	P25Sites_PSAPs	P25Sites_PSAPs

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

3.3 Dynamic Regroup from the UAS

Purpose: **Demonstrate the ability to dynamically regroup Subscriber units from the UAS.**

Expected Results: **This test will combine selected talk groups into a single interop group.**

Setup: **Radios must have "Allow P25T Unsolicited Dynamic Regroup" checked in the radio personality under General Options.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	9980001	TG64051 P25	64001
Radio 2	9980002	TG64052 P25	64002
Radio 3	9980003	TG64053 P25	64003

Execution:

1. At the UAS, select 'Regroup' tab and 'Regroup Profile'.

2. Click 'Add' to add profile detail; name Group 'Regroup1', and Description 'Regroup1 Test'.
   - Define regroup profile; select Agency 998 and 'Talk Group 3'.
   - Select 'OK', and save changes to the UAS.

3. Click 'End User Group' and click 'Add'. Name Group 'Regroup1' and Description 'Regroup1 test'.
   - Select Agency 998 from 'Select a Scope' drop down box.
   - Add 'Radio 1' and 'Radio 2' to the 'Selected' windows.
   - Select 'OK' to close 'End User Group Detail'.
   - Click 'Save' button to Download the new regroup.

4. Click 'Define Regroup' and click 'Add' to name the Regroup 'Regroup1' and Description 'Regroup1 test'.
   - Change 'Profile Name' to 'Regroup1' and change 'End User Group Id' to 'Regroup1'.
   - Click 'OK' and save to click 'Save' the changes to the UAS.

5. Click 'Manage Regroup' check the box for 'Regroup1' and select the button for 'Regroup'.
   - Click 'Save' to start Regroup.
   - Verify that Radio 1 and Radio 2 are forced to 'Talk Group 3'.

6. At 'Radio 1' and 'Radio 2', attempt to change talk groups away from 'Talk Group 3'
   - Verify that both radios are forced to remain on 'Talk Group 3'.

7. PTT 'Radio 1' on 'Talk Group 3'.
   - Verify that 'Radio 3' hears audio on 'Talk Group 3' and can respond.

8. Clear the dynamic regroup from the UAS client.
   - ☐ Verify 'Radio 1' and 'Radio 2' are no longer forced to 'Talk Group 3' (i.e., they can select other predefined Talk-Groups).

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

3.4 Unit Deregistration

Purpose: **Demonstrate that radio will automatically deregister when the radio is turned off.**

Expected Results: **This test will show that radio that is off will not create traffic load demand.**

Setup: **Radio 1 is only radio on 'Talk Group A' for this test.**
All other radios should be on different talk groups.

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	9980001	TG64001 P25	64001
Console	9989101	TG64001 P25	64001

Execution:

1. On a client computer, open the windows internet explorer and browse to https://s0u1rnm.vida.local/nmc. Choose System Map and select 'Launch Application' button. Open Realtime tab and Click Mobiles.
   - ☐ Verify 'Radio 1' LID is shown registered on the site.

2. PTT 'Console' on TG 64001 and verify it communicates on the system to 'Radio 1'.
   - ☐ Return call from 'Radio 1' to 'Console' on TG 64001.

3. Turn off 'Radio 1' and wait for expiration of the radio timeout period.

4. Refresh RNM Mobiles screen periodically and verify Radio 1 deregistered after VNIC Remove Demand Timer has passed.

5. PTT 'Console' on TG 64001, after the expiration of the timeout.
   - ☐ Verify no channel is assigned to site, since no demand exists at the sites.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

3.5 UAS Site Adjacency Configuration

Purpose: **Demonstrate the capability to configure site adjacencies in the UAS.**

Expected Results: **Site adjacencies will be successfully configured and modified.**

Setup: **UAS installed and functioning on System network.**

Execution: Basic test is to follow the manual and SRN instructions to configure site adjacencies using the new graphical interface.

1. In the UAS go to System > System Properties > Site adjacency.
2. Select a site on the left side to configure for adjacency information.
3. Use the left hand side to add adjacencies for the site.
   - ☐ Confirm the adjacent sites are removed from the non-adjacent site list and display correctly on the right side.
4. Use the right hand side to remove a site adjacency.
   - ☐ Confirm the removed adjacency disappears on the right side and is displayed as a non-adjacent site on the left side.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

3.6 Unit Enable/Disable from the UAS

Purpose: **Demonstrate the ability to disable a lost/stolen radio from the UAS.**

Expected Results: **This test will disable & re-enable a designated radio.**

Setup: **Obtain 2 radios switched to the same group and note the IDs. Switch on the radios and ensure that they communicate. Verify all sites are connected to the NSC, and that all sites are online.**

[Note: If a radio is encrypted, Unit Disable will automatically delete the encryption key from the radio, as it is disabled. To restore unit functionality for an encrypted radio, the radio must have the encryption key re-installed**.]**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64001 P25	64001
Radio 4	998005	TG64001 P25	64001

Execution:

1. In the UAS Select TG 64001 on Radios 1, 2, and 4.
   - ☐ Verify that the radios can communicate.

2. From the UAS:
   - ☐ Click Radio 4 ENABLE/DISABLE.
   - ☐ Under the UNIT Enable/Disable tab, enter the ID of radio 4 to be modified.
   - ☐ Select the DISABLE button and check the status.
   - ☐ Attempt to PTT Radio 4 and verify that it will not communicate with the other encrypted radios
   - ☐ PTT Radio 1 and verify that Radio 4 cannot receive the call.

3. Enable the ID of Radio 4.
   - ☐ Verify that the Enable/Disable screen indicates that the Current State of the radio is Enabled.
   - ☐ Confirm that the radios can communicate in unencrypted mode.

4. Switch off Radio 4 and disable it from the Enable/Disable screen.
   - ☐ Switch on the radio and verify that, on logging into the site, it becomes disabled.
   - ☐ Verify that the State settings change to Disabled and that the radios cannot communicate.

5. Enable Radio 4.
   - ☐ Verify that radios can communicate in unencrypted mode.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

4. OVER THE AIR REKEYING (OTAR)

4.1 Generating a system UKEK

Purpose: **This test is setup to verify the KMFs ability to create a UKEK.**

Expected Results: **The KMF will create a UKEK.**

Setup: **This test requires a computer that is on the IP network and has 'Harris Key Manager' installed and running.**

1. Log into the KMF with the administrator level Active Directory Account
2. Open the 'Network KMF Management'
3. Select the UKEK tab
4. Change the 'Save As' text field to '\\fileshare\fileshare\kmf_files\ProvisionFile.ukek'
5. Generate the UKEK file by selecting the 'Export UKEK' button
6. Select the 'SLN Bindings' tab
7. Change the 'Save As' text field to '\\fileshare\fileshare\kmf_files\SlnBindingsReport/xml'
8. Generate the bindings by selecting 'Generate SLN Bindings Report'. This file will be used in a later test.

(Pass/Fail) _____	Tester: _____
Date: _____	Comments: _____
_____	_____
_____	_____
_____	

4.2 UKEK a Radio

Purpose: **This test is setup to verify the KMFs ability to load UKEKs into a radio.**

Expected Results: **The radio should accept the UKEK file developed by the KMF.**

Setup: **This test requires a computer that is on the IP network and has 'Harris Key Manager' installed and running. This test also requires three radios programmed with a talk group utilizing an AES encryption key. All radios should be feature encrypted and enabled for OTAR operation. Two radios should have keys and one radio should not have keys. In test "Unit Enable/Disable from the UAS" they keys were removed from radio 9980005.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64001 P25	64001
Radio 5	998005	TG64001 P25	64001

Execution:

1. On a computer with 'Harris Key Manager' installed, save the file at '\\fileshare\fileshare\kmf_files\ProvisionFile.ukek' to the local computer.
2. Start 'Harris Key Manager' and connect the radio to the local computer.
3. Select 'Tools' -> 'Key Load Wizard' to open key load wizard
4. Select 'Next' -> Load a UKEK file into one or more devices" and open the UKEK file in step 1 and select 'Next'
5. Once the UKEKs are loaded select 'Next'
6. Choose the com port
7. Power on the radio and put the radio into Key Load Mode
8. Select 'Load' to load UKEK into the radio

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

4.3 Warm starting a radio from the UAS Key Management Application

Purpose: **This will test the system's ability to push encryption keys to a radio and the radio to hear other radios on the encrypted talk group.**

Expected Results: **The radio will accept the keys from the system and be able to communicate with other encrypted radios on an encrypted talk group.**

Setup: **This test requires three radios programmed with a talkgroup utilizing an AES encryption key. The radios and talkgroup need to be in a test crypto net in the UAS Key Management Application. The radios should be both feature encrypted and enabled for OTAR operation. Two radios should have working encryption, and Radio 4 should have the ukek load but no keys.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64001 P25	64001
Radio 5	998005	TG64001 P25	64001

Execution

1. PTT all three radios
   - ☐ Radios 1 and 2 should communicate normally
   - ☐ Radio 1 and 2 should hear calls from radio 5 but radio 5 should not be able to hear calls from the encrypted radios
2. From the UAS, warm start radios 5.
   - ☐ The UAS will report "Warm Starting".
3. After the operation is complete, refresh the UAS screen.
   - ☐ Verify the UAS reports "Warm Started Success" for radios 5
4. Again PTT radio 1 on the encrypted talk group and talk.
   - ☐ Radio 1's transmit (TX) indicator should turn on and be amber.
   - ☐ Verify that radio 1 and 2 now decrypt the call's audio.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

4.4 Rekeying and Changing Over a Crypto Net from the UAS

Purpose: **This test will show that the system can change the encryption keys to a new set of keys.**

Expected Results: **After this test is complete the radio will be able to communicate with the new set of keys sent by the system**

Setup: **This test requires three radios programmed with a talk group utilizing an AES encryption key. The radios and talk group need to be in a test crypto net in the UAS Key Management Application. All radios should be feature encrypted and enabled for OTAR operation. The radios should have been warm started previously. If a console and/or GWB are present in the system, then these devices should be included in this test also. They need to be in the same test crypto net as the radios and be programmed with the test talk group. They should have been warm started previously.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64001 P25	64001
Radio 5	998005	TG64001 P25	64001

Execution:

1. Put radios 1, 2 and 5 on the encrypted talk group.
   - Verify that all 3 radios can transmit and receive on the encrypted talk group.
2. Leave radios 1 and 2 powered on and power off Radio 5.
3. From the UAS, rekey the crypto net. The UAS will report “Rekeying” for the crypto net.
4. Select the report icon for the crypto net.
   - Radios 1 and 2 should be shown as “Rekeyed.”
   - Any consoles and/or GWB’s should also be shown as “Rekeyed.”
   - Radio 5 should be shown as “Rekey Failed.”
5. From the UAS, change over the crypto net. It should report “Changing Over” for the crypto net.

6. After the operation is complete, refresh the UAS screen. It should report “Changing Over Complete” for the crypto net

7. Turn on Radio 3. PTT radio 1 on the encrypted talk group and talk. The transmit (TX) indicator should turn on and be amber at radio 1.

   - ☐ Verify that radio 2 but not 3 decrypt the call’s audio.
   - ☐ Verify that any consoles and/or GWB’s decrypt the call’s audio also.

8. PTT Radio 3 on the encrypted talk group and talk.

   - ☐ The transmit (TX) indicator should turn on and be amber at Radio 3.
   - ☐ Verify that radios 1 and 2 decrypt the call’s audio.
   - ☐ Verify that any consoles and/or GWB’s decrypt the call’s audio.

9. From the UAS, do an end user level rekey on Radio 3 for that crypto net.

   - ☐ The UAS will report “Rekeying” for Radio 3.

10. After the operation is complete, refresh the UAS screen. It should now show “Rekeyed” for Radio 3.

    - ☐ Select the report icon for the crypto net. Radios 1, 2, and 3 will be shown as “Rekeyed.”
    - ☐ From the UAS, do an end user change over on Radio 3 for the test crypto net. The UAS will report “Changing Over” for Radio 3.

11. Again PTT radio 1 on the encrypted talk group and talk.

    - ☐ Verify that Radio 1’s transmit (TX) indicator turns amber.
    - ☐ Verify that radio 2 and 3 decrypt the call’s audio.
    - ☐ Verify that any consoles and/or GWB’s decrypt the call’s audio also.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

4.5 Zeroizing a Radio from the UAS Key Management Application

Purpose: **This test will verify the system's ability to delete the keys out of a radio that was encrypted.**

Expected Results: **The test will take a radio that has keys and can communicate with other encrypted radios, and remove the keys so the radio cannot communicate with other encrypted radios.**

Setup: **This test requires three radios programmed with a talk group utilizing an AES encryption key. The radios and talk group need to be in a test crypto net in the UAS Key Management Application. All radios should be feature encrypted and enabled for OTAR operation. The radios should have been warm started previously.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64001 P25	64001
Radio 5	998005	TG64001 P25	64001

Execution:

1. Put radios 1, 2 and 3 on the encrypted talk group.

   - Verify that all 3 radios can transmit and receive on the encrypted talk group.

2. From the UAS, zeroize Radio 3.

   - The UAS will report "Zeroizing" for Radio 3 with the date and time updating to reflect the date and time the operation was initiated.

   - After the operation is complete, refresh the UAS screen. Verify the UAS reports "Zeroized" for Radio 3.

3. PTT radio 1 on the encrypted talk group and talk.

   - The transmit (TX) indicator should turn on and be amber at radio 1.

   - Verify that radio 2 decrypts the call's audio.

   - Radio 3 should hear garbled audio or muted audio.

   - Verify the receive indicator is amber on both radios and the ID of radio 1 should be seen at both radios 2 and 3.

- ☐ Verify Radio 3 shows “No Key 0” when it is PTT’ed on the encrypted talk group.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

4.6 Rekey A Radio from the Radio

Purpose: **This test will test the system's ability to send keys to a radio when the radio requests the keys.**

Expected Results: **The test will take a radio that has keys and can't communicate with other encrypted radios, and add keys to the radio so it can communicate with the system.**

Setup: **This test requires three radios programmed with a talk group utilizing an AES encryption key. The radios and talk group need to be in a test crypto net in the UAS Key Management Application. All radios should be feature encrypted and enabled for OTAR operation. One of the radios should be the radio that was zeroized in the previous test.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64001 P25	64001
Radio 5	998005	TG64001 P25	64001

Execution:

1. Key Radio 1 on an encrypted talk group.

   - Radio 1 should display 'No key' Radio 2, and 3 should not hear the call.

2. From the menu on Radio 1 select 'Rekey' to request new key for Radio 1.

   - Once the radio receives the encryption keys, key Radio 1 and verify Radio 2, and 3 hear the call.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

4.7 UKEK and Symphony

Purpose: **This test is setup to test the KMFs ability to make UKEK files the Symphony can use.**

Expected Results: **The Symphony should accept the UKEK file developed by the KMF.**

Setup: **This test requires three radios programmed with a talk group utilizing an AES encryption key. All radios should be feature encrypted and enabled for OTAR operation.**

Execution:

1. Start the Symphony Application
2. With an encrypted radio make a call on an encrypted talkgroup,
   - the radio with encryption should play the call,
   - the console will not because it does not have keys.
3. Start the ‘Manual Key Loader’ application.
4. Select ‘Load UKEK’
5. Select the ‘Browse’ button
6. Browse to ‘//fileshare/fileshare/KMF_Files/ProvisionFile.ukek’
7. Select the ‘Load’ button
8. Close the application by hitting the ‘Done’ button.
9. Select ‘Maestro Conductor Application’ from the lower right hand side to the console desktop.
10. Select ‘Load Encryption’ this will bring up a window were the binding and UKEK can be loaded into the console
11. Select the button next to the ‘UKEK’ text field and select the UKEK saved in step 9.
12. Select the button next to the ‘binding’ text field and select the binding saved in step 9.
13. Close the ‘Load Encryption’ pop up.

14. With an encrypted radio make a call on an encrypted talkgroup

    - ☐ the radio with encryption should play the call,
    - ☐ the console will now play the call.

15. Choose the talkgroup that the radios are on and select the ‘Private’ button, this will make the console switch the talkgroup to encrypted mode, the console will display ‘PVT’ on the talkgroup button.

16. PTT the console the call should be heard on the encrypted radios.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

4.8 Warm Starting a Symphony from the UAS Key Management Application

Purpose: **This will test the system's ability to push encryption keys to a console.**

Expected Results: **The UAS will push keys to the console to allow for communicate on an encrypted talk group.**

Setup: **This test requires three radios programmed with a talkgroup utilizing an AES encryption key. The radios and talkgroup need to be in a test crypto net in the UAS Key Management Application. All radios should be feature encrypted and enabled for OTAR operation. The radios should have their UKEK's loaded but not have any traffic encryption keys. (Delete Keys if required)**

Execution:

1. Attempt to switch a talk group to encrypted mode by selecting the talk group and selecting the private button.

   - ☐ Verify that console will not allow you to encrypt the talkgroup because the console does not have the encryption keys.

2. From the UAS, warm start the console. After the operation is complete, refresh the UAS screen.

   - ☐ The UAS will report warm started success the console.

3. Attempt to switch a talk group to encrypted mode by selecting the talk group and selecting the private button.
   - ☐ The console will now allow you to encrypt the talkgroup because the console has the encryption keys.

4. PTT the console and the encrypted radios should hear the call.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

5. ENCRYPTED VOICE

5.1 Single Site Encrypted Group Test Call

Purpose: **The Group Test Call will show that the site will allow a radio to communicate using a group call**

Expected Results: **The test will demonstrate that all radios assigned to a common group will hear a call and all radios assigned to an uncommon group will not hear the call**

Setup: **Set Radios 1, 2, and 3 to (Group A) per test group structure. Make sure Scan is turned OFF. All radios should not be in encrypted mode but have encryption keys.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64001 P25	64001
Radio 3	998003	TG64001 P25	64001

Execution:

1. PTT Radio 1 and talk.
   - The transmit (TX) indicators should turn on at Radio 1.
   - Audio should be heard in Radios 2 and 3.
   - The ID of Radio 1 should be seen on Radios 2 and 3.
2. Set Radio 3 to (TG64002 P25). PTT on Radio 1 and talk.
3. The transmit (TX) indicators should turn on at Radio 1.
   - Audio should be heard in Radio 2 only.
   - The ID of Radio 1 should be seen at Radio 2 only.
4. Repeat sets 1-3 for encrypted mode

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

5.2 Single Site Encrypted Individual (Private) Call

Purpose: **The Individual Call test will verify that the site will allow two radios to communicate on a private call**

Expected Results: **This test will demonstrate that two radios can communicate on an individual call and other radios will not hear the private conversation.**

Setup: **Set Radios 1, 2, and 3 to (TG64001) per test group structure. All radios should not be in encrypted mode but have encryption keys.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64001 P25	64001
Radio 3	998003	TG64001 P25	64001

Execution:

1. Using the Radio 1, select the pre-stored ID of Radio 2 or enter the Radio 2 ID directly from the keypad, and PTT Radio 1.
    - Verify that Radio 2 receives the call and displays the ID of Radio 1. Verify that Radio 3 remains idle.
2. Release the PTT on Radio 1 and immediately PTT on Radio 2.
    - Verify that Radio 1 receives the call and displays the ID of Radio 2.
    - Verify Radio 3 remains idle.
3. Using the Radio 1, select the pre-stored ID of Radio 3 or enter the Radio 3 ID directly from the keypad, and PTT Radio 1.
    - Verify that Radio 3 receives the call and displays the ID of Radio 1.
    - Verify that Radio 2 remains idle.
4. Release the PTT on Radio 1 but do not immediately PTT Radio 3.
    - Verify that Radio 3 gives a Call Back Alert (WHC- “Who Has Called”) Indication.

5. Make a return call from Radio 3 back to Radio 1.

   - ☐ Verify that Radio 1 receives the call and displays the ID of Radio 3.
   - ☐ Verify Radio 2 remains idle.

6. Repeat steps 1-5 for encrypted mode.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

5.3 Multi-Site Encrypted Group Test Call

Purpose: **The Group Test Call will show that the site will allow a radio to communicate using a group call**

Expected Results: **The test will demonstrate that all radios assigned to a common group will hear a call and all radios assigned to an uncommon group will not hear the call**

Setup: **Set Radios 1, 2, and 3 to (Group A) per test group structure. Make sure Scan is turned OFF. All radios should not be in encrypted mode but have encryption keys.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64001 P25	64001
Radio 3	998003	TG64001 P25	64001

Execution:

1. PTT Radio 1 and talk.
   - ☐ The transmit (TX) indicators should turn on at Radio 1.
   - ☐ Audio should be heard in Radios 2 and 3.
   - ☐ The ID of Radio 1 should be seen on Radios 2 and 3.
2. Set Radio 3 to (TG64002 P25), PTT on Radio 1 and talk.
   - ☐ The transmit (TX) indicators should turn on at Radio 1.
   - ☐ Audio should be heard in Radio 2 only.
   - ☐ The ID of Radio 1 should be seen at Radio 2 only.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

5.4 Multi-site Encrypted Individual (Private) Call

Purpose: **The Individual Call test will verify that the site will allow two radios to communicate on a private call**

Expected Results: **This test will demonstrate that two radios can communicate on an individual call and other radios will not hear the private conversation.**

Setup: **Set Radios 1, 2, and 3 to (TG64001) per test group structure. All radios should not be in encrypted mode but have encryption keys.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64001 P25	64001
Radio 3	998003	TG64001 P25	64001

Execution:

1. Using the Radio 1, select the pre-stored ID of Radio 2 or enter the Radio 2 ID directly from the keypad, and PTT Radio 1.
   - ☐ Verify that Radio 2 receives the call and displays the ID of Radio 1.
   - ☐ Verify that Radio 3 remains idle.
2. Release the PTT on Radio 1 and immediately PTT on Radio 2.
   - ☐ Verify that Radio 1 receives the call and displays the ID of Radio 2.
   - ☐ Verify Radio 3 remains idle.
3. Using the Radio 1, select the pre-stored ID of Radio 3 or enter the Radio 3 ID directly from the keypad, and PTT Radio 1.
   - ☐ Verify that Radio 3 receives the call and displays the ID of Radio 1.
   - ☐ Verify that Radio 6 remains idle.
4. Release the PTT on Radio 1 but do not immediately PTT Radio 3.

- ☐ Verify that Radio 3 gives a Call Back Alert (WHC- “Who Has Called”) Indication.
- ☐ Then make the return call from Radio 3 back to Radio 1.
- ☐ Verify that Radio 1 receives the call and displays the ID of Radio 3.
- ☐ Verify Radio 2 remains idle.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

5.5 Phase 2 AES

Purpose: **Confirms the operation of AES encryption for phase 2 voice calls.**

Expected Results: **The encrypted talk groups can communicate.**

Setup **Console 1 programmed with a AES encrypted phase 2 talk group and two radios programmed with the same AES Talk group and key, one radio with the group but no key and one radio with the AES group with a different key.**

Execution:

1. Place a call from one of the radios with the correct key on the AES group
   - ☐ Confirm that the call is heard on the other radio and the console
   - ☐ Confirm the call is not heard on the two radios that do not have the correct key.
2. Place a call on the AES group from the console
   - ☐ Confirm that the call is heard on the two radios with the correct key
   - ☐ Confirm the call is not heard on the two radios that do not have the correct key.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

6. DATA

6.1 P25 Over-the-Air Data Test

Purpose: **Confirm remote radio terminals can be accessed from a Profile Manager host over the VIDA network and personalities can be read/programmed using Over-the-Air-Programming (OTAP).**

Expected Results: **The radio can be pinged and radio personality can be read/programmed using the Profile Manager host.**

Setup: **Test requires a radio on the system and a host computer that is logged on to the system. Profile Manager and RPM2 are both installed and running on Host Computer.**

Execution:

1. Log the radio into the site to be tested.
   - ☐ Verify that a host can ping the radio.
2. Over the air, read the radio personality.
3. Change the name of one of the talk groups, and write the change to the radio.
   - ☐ Verify that the name of the talk group has changed on the radio.
4. Reprogram the radio with the initial personality.

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

7. ENCRYPTED DATA

7.1 Encrypted data on an unencrypted radio

Purpose: **Confirm that when the system is setup for encrypted data, the data communication leaves the system encrypted and cannot be read by a radio that does not have the encryption key.**

Expected Results: **The radio can't be pinged and the radio personality can't be read/programmed.**

Setup: **This test requires: section 'Unit Enable/Disable from the UAS' has been performed, radio 9880005 is enabled but not encrypted, needs to run from edata terminal, edata setup not set to best effort.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	9980001	TG64001 P25	64001
Radio 2	9980002	TG64001 P25	64001
Radio 5	9980005	TG64001 P25	64001

Execution:

1. From the edata terminal.
   - ☐ Verify that a host can't ping the radio.
   - ☐ Verify the radio personality can't be read.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

7.2 Unencrypted data With Encrypted Radio

Purpose: **Confirm when a radio does have the encryption key it can communicate with the Encrypted Data Terminal.**

Expected Results: **The radio can be pinged and the radio personality can be read/programmed.**

Setup: **This test requires: Radio 9880004 is enabled and encrypted, needs to run from edata terminal, edata setup not set to best effort.**

Radio 4 needs to be part of the "eData CryptoNet", and also have "keys" loaded.

Description	Radio LID	TG Description	TG ID
Radio 4	9980004	TG 64001 P25	64001

Execution:

1. From the edata terminal.
   - ☐ Verify that a host can ping the Radio 4.
   - ☐ Verify the radio personality can be read.

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

8. IN-CALL STATUS REPORTING

8.1 In-Call Location Reporting Radio

Purpose: **This test will demonstrate system ability to send location status from a radio.**

Expected Results: **The system will display the radio location, and the location will change when the radio moves.**

Setup: **The system needs to be setup using the 'In-Call Status Reporting Manual' and the CLTsim need to be set up using Appendix A. This test will not work unless the radio has GPS lock so this test may not work indoors.**

Execution:

1. Log into CLTsim and open two terminal windows
   a. In terminal windows 1 type './cltsim –ccltsim.cfg' do not close the window
   b. In terminal windows 2 type
   'cltcmd -1 10.128.1.209 –u 21225 –s –j ipv4.10.128.79.1@vida.local –n location –n userStatus

2. PTT radio 1 for at least 3 seconds

3. Terminal widow 1 will show the output of the GPS data.

   ☐ Check to make sure GPS data is displayed.

4. Move radio 1 about 50 feet and PTT again for 3 seconds

   ☐ Verify GPS Data changes.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

8.2 In-Call Status Reporting Radio

Purpose: **This test will demonstrate system ability to send status from a radio.**

Expected Results: **The system will display the status from a radio.**

Setup: **The system needs to be setup using the 'In-Call Status Reporting Manual' and the CLTsim need to be set up using Appendix A.**

Execution:

1. Use terminal windows from pervious test
   a. In terminal windows 2 type
      'cltcmd -1 10.128.1.209 –u 21225 –s –j vuid.99999.10.998.6401@harris.com –n groupAlert –n userStatus

2. PTT radio 1 for at least 3 seconds

3. Terminal widow 1 will show the status of radio 1.

   ☐ Check to make sure radio 1 status is 'Open'.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

8.3 In-Call Emergency Reporting Radio

Purpose: **This test will demonstrate system ability to send location status from a radio.**

Expected Results: **The system will display the radio emergencies.**

Setup: **The system needs to be setup using the 'In-Call Status Reporting Manual' and the CLTsim need to be set up using Appendix A.**

Execution:

1. Use terminal windows from pervious test
   a. In terminal windows 2 type
   'cltcmd -1 10.128.1.209 –u 21225 –s –j vuid.99999.10.998.6401@harris.com –n groupAlert –n userStatus

2. Create emergency on Radio1.

   - ☐ Check to make sure Emergency is displayed as '1'.

3. Clear emergency on Radio 1
   - ☐ Check to make sure Emergency is changed to '0'

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

8.4 In-Call Location Reporting Be-On

Purpose: **This test will demonstrate system ability to send location status from a BeOn terminal.**

Expected Results: **The system will display the radio location, and the location will change when the radio moves.**

Setup: **The system needs to be setup using the 'In-Call Status Reporting Manual' and the CLTsim need to be set up using Appendix A. This test will not work unless the radio has GPS lock so this test may not work indoors.**

Execution:

1. Log into CLTsim and open two terminal windows
   a. In terminal windows 1 type './cltsim –ccltsim.cfg' do not close the window
   b. In terminal windows 2 type
      'cltcmd -1 10.128.1.209 –u 21225 –s –j ipv4.10.128.79.1@vida.local –n location –n userStatus

2. PTT radio 1 for at least 3 seconds

3. Terminal widow 1 will show the output of the GPS data.

   ☐ Check to make sure GPS data is displayed.

4. Move radio 1 about 50 feet and PTT again for 3 seconds

   ☐ Verify GPS Data changes.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

8.5 In-Call Status Reporting Be-On

Purpose: **This test will demonstrate system ability to send status from a radio.**

Expected Results: **The system will display the status from a radio.**

Setup: **The system needs to be setup using the 'In-Call Status Reporting Manual' and the CLTsim need to be set up using Appendix A.**

Execution:

1. Use terminal windows from pervious test
   a. In terminal windows 2 type
      'cltcmd -1 10.128.1.209 –u 21225 –s –j vuid.99999.10.998.6401@harris.com –n groupAlert –n userStatus

2. PTT radio 1 for at least 3 seconds

3. Terminal widow 1 will show the status of radio 1.

   ☐ Check to make sure radio 1 status is 'Open'.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

8.6 In-Call Emergency Reporting Be-On

Purpose: **This test will demonstrate system ability to send location status from a radio.**

Expected Results: **The system will display the radio emergencies.**

Setup: **The system needs to be setup using the 'In-Call Status Reporting Manual' and the CLTsim need to be set up using Appendix A.**

Execution:

1. Use terminal windows from pervious test
   a. In terminal windows 2 type
   'cltcmd -1 10.128.1.209 –u 21225 –s –j vuid.99999.10.998.6401@harris.com –n groupAlert –n userStatus

2. Create emergency on Radio1.

   - ☐ Check to make sure Emergency is displayed as '1'.

3. Clear emergency on Radio 1

   - ☐ Check to make sure Emergency is changed to '0'

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

9. HIGH AVAIBILITY

9.1 Wide Area Router Failure

Purpose: **Demonstrate the capabilities of the system to work after a WAR failure**

Expected Results: **System components that are set-up with High Availability will continue to work after a WAR failure.**

Setup: **These tests are setup to be run twice, once on each router. So after completing step 4 restart the WAR router if not already running wait 20 minutes, and rerun the tests for the second router. These tests will simulate a WAR failure by disconnecting it from the Wide Area Network, so the WAR to WAN connection will need to be known.**

1. Use Radio 1 to initiate a call

   - Verify that the call is heard on the Radio 2. Keep the call active during fail-over.

2. Use Radio 3 to initiate a call

   - Verify that the call is heard on Radio 4. Keep the call active during fail-over.

3. Log in to s0u1nss and s0u2nss, and change your user to the root user by typing ‘su –‘ and entering the password.

4. Type ‘HArunning’ into both NSSs, one will report that it is the ‘Stand By’ and one will report that it is the ‘Primary’ log the information in the chart below.

	Name of Primary NSS	Name of Primary WAR	Name of Primary RNM	Name of Primary RSM	Shutdown Time
Test 1					
Test 2					

5. Log into the ‘Primary’ WAR that is associated with the ‘Primary’ NSS. Shut off the connection to the WAN by performing a shut on the necessary ports.

   - The call from Radio 3 to Radio 4 will be dropped.

- ☐ The call from radio 1 to 2 will continue and the console will lose connectivity to the VNIC.
- ☐ Verify that after a short delay, the Backup server NSS2 automatically takes over as the primary server.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

9.2 UAS Site Access Control for Invalid User ID

Purpose: **This test will demonstrate access control for Subscriber units with invalid radio IDs and High Availability of the RSM.**

Expected Results: **This test will deny a radio with an invalid Subscriber ID access to the system. Once the radio is added to the system the primary RSM will download it to the sites and allow the radio access. When the primary RSM is turned off and the radio is deleted from the UAS the secondary RSM will delete the radio from the system. Once the radio is deleted from the system the radio will again be denied access.**

Setup: **Use the table below to set up the new radio in the UAS**

Voice End User								
User Id	**Name**	**Description**	**Personality**	**User Privilege**	**Enable P25 AES OTAR**	**Manually-Keyed**	**P25 Voice Auth**	**Preferred Vocoder**
010:998:9150	Rad9150	Radio9150	Pers1	998_10_supervisor	FALSE	FALSE	FALSE	P25 Full Rate
OS Voice Auth	**Transc Allowed Flag**							
FALSE	TRUE							

Subscriber Unit							
Description	**RSI**	**Electronic Serial Number**	**Protocol Mask**	**Status**	**Sub Type**	**Assigned End User**	**Algorithm Support**
Radio9150	99899150	109989150	P25	Enabled Unit	Harris P5400	010:998:9105	AES

Execution:

1. Log into a site traffic controller and type ‘show udb 109989150’

   - Verify the radio is not present in the traffic controller database

2. Program Radio 9801 with an ID 9989150.

3. Attempt to PTT Radio 9150.

   - ☐ Verify access to the site is denied and audio is not heard on Radio 2.
   - ☐ Verify the system is still functional by PTT Radio 2 and verify the audio is heard on Radio 3.

4. Use the supplied table to enter radio 109989150 in to the UAS database.
   a. Select Agency/"agency name"/Voice End User. Click Add Entry and then on the End User Detail screen input the User ID, password ("p25user"), Name, Description, etc. of the user. Click OK and download.

      - ☐ Verify the user ID has been added to the list of users\

   b. Select Agency/"agency name"/Subscriber Unit and enter the appropriate User ID, IP Address, and ESN for the user created in step 7. Click OK and download.

5. Log into a site traffic controller issue a "show udb 109989150

   - ☐ Verify the radio is now present in the traffic controller database

6. Key radio 9150

   - ☐ Verify access to the site is permitted and audio is heard on radio.

7. Restart radio 9150 and PTT the radio

   - ☐ Verify access to the site is permitted and audio is heard on radio 9012.

8. Delete 10998999150 from the UAS database

9. Key radio 9150 from UAS

   - ☐ Verify access to the site is not permitted and audio is not heard.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

9.3 Site Activity using the Activity Warehouse

Purpose: **Demonstrate the capability to create various Agency level system usage reports.**

Expected Results: **This test will create an Agency level user reports.**

Setup: **Ensure radio traffic has occurred across the network recently. If necessary or desired, place some calls with a known radio ID on multisite talk groups prior to running the test for reference during the test.**

Execution:

1. Log into the SMT PC as a System level administrator.

2. Open Internet Explorer and browse to 'https://*s0u1pro.vida.local/*reports' and log in with active directory credentials.

3. Select Activity Reports → Call Activity
   a. enter the time period for the report (example: 2-hour window before this test).

4. Enter additional report information required.

5. Click on "View Report"
   - ☐ Check to make sure that there is call activity. These reports can be up to 2 hours behind.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

10. VIDA REGIONAL NETWORK MANAGER (RNM)

10.1 RNM Real Time Call Activity

Purpose: **Demonstrate the capability to monitor real-time call activity from the RNM.**

Expected Results: **This test will show active call traffic on specific talk groups and SIDs.**

Setup: **Administrator access to the RNM.**

Execution:

1. On a client computer, open the windows Internet Explorer and browse to https://s0u1rnm.vida.local/nmc and log in with an Active Directory account.
2. Choose the system map and select the ‘Launch Application’ button.
3. Open the Realtime tab and Click Site Calls.
4. Select the site and expand.
5. Check the box next to the channels and select to add the channels to the target list. Select the ‘ok’ button to launch the application.
6. Place a group call from Radio 1 to Radio 2 on the site.
   - ☐ Verify that the event viewer displays the talkgroup ID and calling party ID.
   - ☐ Verify the state changes from Free to Talk.
   - ☐ Verify the TG Alias displays the Group Number.
7. Use Internet Explorer to browse to https://s0u2rnm.vida.local/nmc and repeat test steps 1-6 for the second RNM.

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

10.2 Regional Network Manger Test

Purpose: **Demonstrate the capability to monitor system alerts from the RNM.**

Expected Results: **This test will show system level equipment icons.**

Setup: **Administrator access to the RNM.**

Execution:

1. On a client computer, open the windows Internet Explorer and browse to https://s0u1rnm.vida.local/nmc and log in with the active directory account.

2. Choose the system map and select the ‘Launch Application’ button. Select the ‘Network’ tab and expand the tree in the left hand panel until you can see a site in the right hand panel.

   - Verify the Infrastructure is presented.

   - Select an object and right click to select properties to view information related to the object.

3. Substitute https://s0u2rnm.vida.local/nmc and repeat test steps 1-3 for the second RNM.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

10.3 RF System Alarms Indications are reported to the RNM

Purpose: **Demonstrate the capability to monitor system faults & alarms at the RNM.**

Expected Results: **System level equipment will indicate faults & alarms at the RNM.**

Setup: **Access to the site under test and the regional RNM. The alarm will need to be generated by equipment being physically powered-down. Note the time of the alarm condition for later tests. Call up the RNM Domain screen and verify that all map icons are either green or blue. On the Fault Browser screen delete any prior alarms.**

Execution:

1. On a client computer, open the windows Internet Explorer and browse to https://s0u1rnm.vida.local/nmc and log in with an Active Directory account.

2. Choose the system map and select the ‘Launch Application’ button.

3. Select the ‘Network’ tab and expand the tree in the left hand panel until you can see a site in the right hand panel.

4. Generate an alarm on a device (see chart) by powering down or otherwise disabling the device.

   - ☐ Verify that the RNM indicates a site alarm for the affected device.

5. Turn the device back ON.

   - ☐ Verify that the device alarm clears and displays green.

6. Review alarm details by performing a Right Mouse Click on an Object. Select the desired menu option.

7. Repeat steps 1-4 for all equipment listed in the below chart.

8. Substitute https://s0u2rnm.vida.local/nmc and repeat test steps 1-5 for the second RNM.

Record the results below for each site. (Note: This form can be modified to reflect actual as-built alarms

Tester:		Results:	Date:	
Alarm #	Name	Pass/Fail	Remarks	
1	Traffic Controller			
2	Router			
3	Switch			
4	Network Sentry			
5	MME			

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

10.4 Network Sentry Site Alarm Indications are reported to the RNM

Purpose: **Demonstrate the capability to monitor site faults & alarms at the RNM.**

Expected Results: **Site level equipment will indicate faults & alarms at the RNM.**

Setup: **This test verifies that the Site & Shelter Alarms are connected to the new system and alarm names are programmed to show the alarm types and locations. Site specific digital alarm inputs connected to the alarm management system (NetGuardian or Network Sentry) alarm unit.**

Execution:

1. On a client computer, open the windows Internet Explorer and browse to https://s0u1rnm.vida.local/nmc and log in with the Active Directory account.

2. Choose the system map and select the 'Launch Application' button.

3. Select the 'Network' tab and expand the tree in the left hand panel until you can see a site in the right hand panel.

4. Select a physical site to test alarm inputs.

5. Create a condition that will either simulate an alarm (jumper alarm contacts) or the actual event to trigger each alarm

   - Verify that the alarm is detected and displayed in the RNM Network Viewer and is listed in the Fault Browser

6. Clear the alarm condition

   - Observe that the alarm indication has cleared in both the Network Viewer and the Fault Browser

7. Repeat for each alarm and for each site in the system

8. Record the results below for each site. (Note; This form can be modified to reflect actual as-built alarms).

Site #:			Site Name	
Tester:		Results:	Date:	
Alarm #	Name	Pass/Fail	Remarks	
1	Door			
2	Smoke Detector			
3	Heat Detector			
4	Building Low Temp			
5	Building High Temp			
6	Main Power Fail			
7	ATS Normal			
8	ATS Emergency			
9	Generator Low Oil			
10	Generator Over Temp			
11	Generator Over Crank			
12	ACH1 L.O.			
13	ACH2 L.O.			
14	Surge Arrestor 1			
15	Surge Arrestor 2			
16	Multicoupler Top			
17	Multicoupler Bottom			

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

11. SIMULCAST CONTROL POINT MOVEMENT

11.1 DCP Forced Control Point Movement

Purpose: **This test will demonstrate the DCP system can move the control point in response to user command.**

Expected Results: **This test will verify that the Control Point can be moved from the active site to an alternate Control Point Site. After the control point is switched to the alternate Control Point the system should operate normally.**

Setup: **The DCP system is operating with an active control point and at least two sites are enabled to be the control point.**

Execution:

1. Log into the RNM
2. In Network view identify the site which is the active control point.
3. Right click on the control point site icon and select ‘Change Control Point to Best Site Available”.
4. Verify system is still functioning (i.e. voice calls can be made – between radios and a radio and console and optionally data calls can be made (e.g. radios can be ‘pinged’).
5. Verify that the RNM indicates a different site as control point and the previous control point is now a TX site. (note – a CP only site displays “zzzz” when it is not the active control point.)
6. On the RNM right click on the previous control point site and select “Change to be Control Point”.
7. Verify system is still functioning (i.e. calls can be made – between radios and a radio and console and optionally data calls can be made (e.g. radios can be ‘pinged’).
8. Verify that the RNM indicates the control point has moved to the site selected in step 6 and the previous control point is now a TX site. (note – a CP only site displays “zzzz” when it is not the active control point.)

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

11.2 DCP Control Point Movement in response to Faults at the Active Control Point

Purpose: **This test will demonstrate that the Control Point will move in response to failures at the active Control Point.**

Expected Results: **This test will verify that the DCP system will move the active Control Point to an alternate control point site when the active control point experiences failures. After the Control Point moves the old control point should drop into bypass and the rest of the system should operate normally as a Simulcast cluster.**

Setup: **The DCP system is operating with an active control point and is properly configured with at least two sites enabled to be the control point.**

Execution:

1. Verify system is functioning (i.e. calls can be made – between radios and a radio and console and optionally data calls can be made (e.g. radios can be 'pinged').

2. At the control point site disconnect the 1pps cable from GPS B.

3. Verify the system is still functioning (i.e. calls can be made – between radios and a radio and console and optionally data calls can be made (e.g. radios can be 'pinged') and control point has not moved. The traffic controllers at the control point display 'CC xx' and 'TC xx' when idle; at a satellite site the traffic controllers display "TR xx' where xx is the channel number. (>

4. At the control point site disconnect the 1pps cable from GPS A.

5. Verify that the control point moved to next ranked site and the old control point is now in bypass. The traffic controllers at the control point display 'CC xx' and 'TC xx' when idle: Any channels that are configured to be active at the old control point site when it is in bypass will have all their status LED red. In bypass all the traffic controllers display 'CC xx' and 'TC xx' when idle and the status LED will be red.

6. Verify the RNM indicates the new control point and shows the old control point site is now in bypass.

7. Verify the simulcast system is still functioning (i.e. calls can be made – between radios and a radio and console and optionally data calls can be made (e.g. radios can be 'pinged').

8. If the old control point has channels active in bypass verify radios switched to this bypass site acquire the control channel and can communicate. (note – this step could be skipped; the bypass tests in sections 20.x will do this) >

9. Restore the connections to the GPS receivers at the site in bypass (the old control point site).

10. Verify that the site exits bypass and joins the simulcast cluster.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

12. P25 TRUNKED CALLS AND SITE FEATURES

Purpose: **These tests will verify that the site can provide radio communications at the site level.**

Expected Results: **These tests will demonstrate that the site can provide communications for radios.**

Setup: **All tests in this section assume that the UAS setup matches the configuration in this test. All testing in this section is to be done with phase 1 radios.**

12.1 Transmit Grant Tone

Purpose: **Demonstrate the system channel grant tone is heard on the radio.**

Expected Results: **This test will show that the radio will play a grant tone when the radio is assigned a working channel.**

Setup: **One radio with valid ID and a valid group on selected system. Grant tone (Ready to Talk tone) enabled in radio personality as applicable for specific radio type being tested.**

Execution:

1. Press PTT button on radio with valid group selected.
2. Verify grant tone is heard at radio when working channel access is granted.

Note: If the call is queued, the grant tone will be delayed until the call is assigned a working channel.

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

12.2 Group Test Call

Purpose: **The Group Test Call will show that the site will allow a radio to communicate using a group call.**

Expected Results: **The test will demonstrate that all radios assigned to a common group will hear a call and all radios assigned to an uncommon group will not hear the call.**

Setup: **Set Radios 1, 2, and 3 to (Group A) per test group structure. Make sure Scan is turned OFF.**

Description	Radio LID	TG Description	TG ID
Radio 1	9980001	TG 64001 P25	64001
Radio 2	9980002	TG 64001 P25	64001
Radio 3	9980003	TG 64001 P25	64001

Execution:

1. PTT Radio 1 and talk.
   - ☐ The transmit (TX) indicators should turn on at Radio 1.
   - ☐ Audio should be heard in Radios 2 and 3.
   - ☐ The ID of Radio 1 should be seen on Radios 2 and 3.

2. Set Radio 3 to (TG64002 P25). PTT on Radio 1 and talk.
   - ☐ The transmit (TX) indicators should turn on at Radio 1.
   - ☐ Audio should be heard in Radio 2 only.
   - ☐ The ID of Radio 1 should be seen at Radio 2 only.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

12.3 Individual (Private) Call

Purpose: **The Individual Call test will verify that the site will allow two radios to communicate on a private call**

Expected Results: **This test will demonstrate that two radios can communicate on an individual call and other radios will not hear the private conversation.**

Setup: **Set Radios 1, 2, and 3 to (TG64001) per test group structure.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64001 P25	64001
Radio 3	998003	TG64001 P25	64001

Execution:

1. Using the Radio 1, select the pre-stored ID of Radio 2 or enter the Radio 2 ID directly from the keypad, and PTT Radio 1.

   - Verify that Radio 2 receives the call and displays the ID of Radio 1.
   - Verify that Radio 3 remains idle.

2. Release the PTT on Radio 1 and immediately PTT on Radio 2.

   - Verify that Radio 1 receives the call and displays the ID of Radio 2.
   - Verify Radio 3 remains idle.

3. Using the Radio 1, select the pre-stored ID of Radio 3 or enter the Radio 3 ID directly from the keypad, and PTT Radio 1.

   - Verify that Radio 3 receives the call and displays the ID of Radio 1.
   - Verify that Radio 2 remains idle.

4. Release the PTT on Radio 1 but do not immediately PTT Radio 3.

   - Verify that Radio 3 gives a Call Back Alert (WHC- “Who Has Called”) Indication.

5. Make the return call from Radio 3 back to Radio 1.

   - ☐ Verify that Radio 1 receives the call and displays the ID of Radio 3.
   - ☐ Verify Radio 2 remains idle.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

12.4 Transmission Trunking

Purpose: **This test will demonstrate that the System is working as a Transmission Trunking system.**

Expected Results: **The tests verify that the Control Channel will assign a working channel to the radio and that the radio and site will work as a trunking set.**

Setup: **Radios 1, 2, and 3 should be the only radios on the system.**

Monitor System channel assignment in RSM Site Activity Real-Time Viewer.

All Radios are registered on Site 1.

Description	Radio LID	TG Description	TG ID
Radio 1	9980001	TG 64001 P25	64001
Radio 2	9980002	TG 64001 P25	64001
Radio 3	9980003	TG 64001 P25	64001

Execution:

1. Log into RNM and start RSM Site Activity application in the real time viewer. Observe all channels on Site 1.
2. PTT Radio 1 and talk.
   - The transmit (TX) indicators should turn on at Radio 1.
   - Verify the number of the channel assigned.
3. PTT Radio 2 and talk.
   - The transmit (TX) indicators should turn on at Radio 2.
   - Verify the next channel is assigned.
4. PTT Radio 3 and talk.
   - The transmit (TX) indicators should turn on at Radio 3.
   - Verify the next channel is assigned.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

12.5 Message Trunking on Phase 1

Purpose: **This test will demonstrate that the system, for FMDA Phase 1 group calls, operates as Enhanced Message Trunking for Group Calls.**

Expected Results: **Verify that the system will assign the same working channel to a Message Trunking call if the next call happens within the Message Trunking hang time. During the hang time, the transmitting radio will return to the Control Channel for Phase 1 Group Calls.**

Setup: **Radios 1, 2, and 3 should be the only radios on the system. Each call needs to happen within 3 seconds of each other for this test to work.**
TG 64301 is a FDMA (Phase 1) MT Group.

Monitor System channel assignment in RSM Site Activity Real-time viewer.

Description	Radio LID	TG Description	TG ID	Site
Radio 1	9980001	TG 64301 P25	64301	1
Radio 2	9980002	TG 64301 P25	64301	1
Radio 3	9980003	TG 64301 P25	64301	1

Execution:

1. Log into RNM and start RSM Site Activity application in the real time viewer. Observe all channels on Site 1 for each of the steps below.

2. PTT Radio 1 and talk.
   - ☐ The transmit (TX) indicators (red light) should turn on at Radio 1.
   - ☐ On the RNM, observe the number of the channel assigned.
   - ☐ Verify audio from Radio 1 is heard at Radio 2 and Radio 3.

3. Un-PTT Radio 1.
   - ☐ Verify Radio 1's LED light turns off, no color, to indicate Radio 1 is on the Control Channel (CC), during the Hang Time. (This is Enhanced Message Trunking for FDMA).

4. PTT Radio 2, within the 3 second hang time, and talk.
   - ☐ The transmit (TX) indicators (red light) should turn on at Radio 2.
   - ☐ Verify the same channel is assigned, as in step 2.
   - ☐ Verify audio from Radio 2 is heard at Radio 1 and Radio 3.

5. Un-PTT Radio 2.
   - ☐ Verify Radio 2's LED light turns off, no color, to indicate Radio 2 is on the Control Channel (CC), during the Hang Time.

6. PTT Radio 3, within the 3 second hang time, and talk.
   - ☐ The transmit (TX) indicators (red light) should turn on at Radio 3.
   - ☐ Verify the same channel is assigned as in steps 2, & 4.
   - ☐ Verify audio from Radio 3 is heard at Radio 1 and Radio 2.

7. Un-PTT Radio 3
   - ☐ Verify Radio 3's LED light turns off, no color, to indicate Radio 3 is on the Control Channel (CC), during the Hang Time.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

12.6 Message Trunking on Phase 2

Purpose: **Demonstrate the system, for TDMA Phase 2 group calls, operates as Standard Message Trunking for Group Calls.**

Expected Results: **System will assign the same working channel to a Message Trunked call, if the next call happens within the Message Trunked hang time. During the hang time, the transmitting radio will remain on the Traffic (Working) Channel for Phase 2 Group Calls.**

Setup: **TDMA Enabled Radios 1, 2, and 3 should be the only radios on the system. Each call needs to happen within 3 seconds of each other for this test to work. TG 64353 is a TDMA (Phase 2) MT Group**

Monitor System channel assignment in RSM Site Activity Real-time Viewer.

Description	Radio LID	TG Description	TG ID	Site
Radio 1	9980001	TG 64353 P25	64353	1
Radio 2	9980002	TG 64353 P25	64353	1
Radio 3	9980003	TG 64353 P25	64353	1

Execution:

1. Log into RNM and start RSM Site Activity application in the real time viewer. Observe all channels on Site 1 for each of the steps below.

2. PTT Radio 1 and talk.
   - ☐ The transmit (TX) indicators (red light) should turn on at Radio 1.
   - ☐ On the RNM, observe the number of the channel assigned and the channel slot assigned.
   - ☐ Verify audio from Radio 1 is heard at Radios 2 and 3.

3. Un-PTT Radio 1
   - ☐ Verify Radio 1's LED Receive (RX) indicator turns green, to indicate Radio 1 remains on the Traffic (Working) channel, during the Hang Time.

4. PTT Radio 2, within the 3 second hang time, and talk.
   - ☐ The transmit (TX) indicators (red light) should turn on at Radio 2.
   - ☐ Verify the same channel / slot is assigned, as in step 2.
   - ☐ Verify audio from Radio 2 is heard at Radios 1 and 3.

5. Un-PTT Radio 2
   - ☐ Verify Radio 2's LED light turns green, to indicate Receive (Rx). Indicates Radio 2 remains on the Traffic (Working) channel, during the Hang Time.

6. PTT Radio 3, within the 3 second hang time, and talk.
   - ☐ The transmit (TX) indicators (red light) should turn on at Radio 3.
   - ☐ Verify the same channel / slot is assigned in steps 2 & 4.
   - ☐ Verify audio from Radio 3 is heard at Radios 1 and 2.

7. Un-PTT Radio 3
   - ☐ Verify Radio 3's LED light turns green, to indicate Receive (Rx). Indicates Radio 3 remains on the Traffic (Working) channel, during the Hang Time.

- ☐ After the hang time expires, verify Radio 3's LED light turns off.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

12.7 Unit to Unit Call Alert Paging

Purpose: **To demonstrate that a radio can send a page to a different radio on the system.**

Expected Results: **This test will verify that radio 1 can send a page to radio 2**

Setup: **Radio 1 with Call Alert programmed into a button (“PAGE”) and Radio 2’s ID programmed into its Individual Call list. Radio 1 and Radio 2 on the same site.**

Execution:

1. Select the PAGE function from the MENU on Radio 1. Select Radio 2 from the preprogrammed list of radios and PTT Radio 1.

   - ☐ Verify Radio 1 displays “*TX PAGE” on the second line.
   - ☐ Verify Radio 2 displays the ID of Radio 1 on its first line and “*RX PAGE” on the second line.
   - ☐ Verify Radio 2 beeps multiple times to indicate a received page.
   - ☐ Verify Radio 1 beeps multiple times to indicate the page was successfully sent.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

12.8 Multi-site Announcement Group Call

Purpose: **This test will demonstrate that the system will allow a group call to function in a multi-site environment**

Expected Results: **The test will demonstrate that all radios assigned to a common group will hear a call, even though some of the radios are at distant sites and all radios assigned to an uncommon group will not hear the call**

Setup: **Groups 64101 and 64102 are in Announcement Group 64107 per test group structure. Ensure Scan is turned OFF.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64002 P25	64002
Radio 3	998002	TG64003 P25	64003

Execution:

1. PTT Radio 1 and talk.
2. The transmit (TX) indicators should turn on at Radio 1.
   - ☐ Audio should be heard on Radios 2 and 3.
   - ☐ ANNOUNCE should be displayed on Radios 2 and 3.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

12.9 Multisite Emergency Group Call

Purpose: **Demonstrate the capability of the system to process an emergency group call.**

Expected Results: **This test will verify that when a radio indicates an emergency group call. All other radios in the group indicate an emergency and the emergency can be cleared by an administrator radio.**

Setup: **Program 3 Radios with the same emergency home group. Set the supervisor (Radio 1) & Radio 2 to the home group. Set Radio 3 to a different group (not home group). A console will be used to clear the emergency.**

Description	Radio LID	TG Description	TG ID	Site
Radio 1	9980001	TG 64001 P25	64001	1
Radio 2	9980002	TG 64001 P25	64001	2
Radio 3	9980003	TG 64003 P25	64003	1

Execution:

1. Press the Emergency call button on Radio 1 and talk within the pre-defined Emergency Auto-key time, and/or PTT Radio 1 during or just after that time.

   - ☐ Verify that Radio 1 indicates the “TX EMER” declaration and that it reverts to the home group.
   - ☐ Verify that Radio 1 (on Site 1) and Radio 2 (on Site 2) indicate a “RX EMER” and hear audio on the emergency home group.
   - ☐ Verify Radio 3 does not display the emergency.

2. Clear the emergency with the Console.

   - ☐ Verify the emergency clears in the radios.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

12.10 System All Call

Purpose: **Demonstrate the capability of the system to route a call to all radios on the system.**

Expected Results: **This test will demonstrate the system's ability to route a single call to all available radios on the system.**

Setup: **Note: If want to create demand for a Full Rate All Call, then one radio must be on the Full Rate All Call.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	9980001	TG64000 P25	64000
Radio 2	9980002	TG64001 P25	64001
Radio 3	9980003	TG64002 P25	64002

Execution:

1. With Radio 1 place an Individual call to talk group 64000 (All Call Talk Group)

   - Audio should be heard at Radios 2 and 3.

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

12.11 Transmit Denied (for Invalid radio ID)

Purpose: **This test is set up to demonstrate that a radio can be denied transmission on a site**

Expected Results: **This test will verify the systems ability to deny a radio to transmit on one site and allow the radio to work on a different site.**

Setup: **Program system so that radio ID is not valid on the site under test. Download database to site.**

Execution:

1. Program Radio 1 with an invalid ID
2. PTT Radio 1
   - Verify the radio is prohibited access to system.
3. Reprogram the radio to the original personality.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

12.12 Single Site Call Queue Declaration Alert

Purpose: **This test will demonstrate the system queuing.**

Expected Results: **This test will verify that the system will assign users in a queue when the system has no available channels and assign users a working channel when the system has an available channel.**

Setup: **This test requires four radios and two working channels. Disable channels (if necessary) until there are two working channels at the site. This test is to be run with no other users on the system.**

Description	Radio LID	TG Description	TG ID
Radio 1	9980001	TG 64001 P25	64001
Radio 2	9980002	TG 64002 P25	64002
Radio 3	9980003	TG 64003 P25	64003
Radio 4	9980004	TG 64003 P25	64003

Execution:

1. Busy up all talk paths on the system with radio 1, and 2 by pressing and holding the PTT button.
2. With all talk paths busied, momentarily press and release the PTT button on test Radio 3
   - Verify that a Call Queued tone is heard at the radio.
3. Unkey (release PTT button) radio 2.
   - Verify that Radio 3 is assigned to the free talk path.
4. The grant tone is heard at the radio, without having to rekey the radio (repressing the PTT button).
5. Press the PTT button on Radio 3 within the auto key time applicable to the radio type (approx. 2 seconds) to keep the assigned channel.
   - Verify that audio from Radio 3 is heard at Radio 4.
6. Unkey all radios.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

12.13 Recent User Priority

Purpose: **Demonstrate system's ability to prioritize recent users in queueing situations.**

Expected Results: **When radios of the same priority level enter the queue, one that has been recently active will exit the queue first.**

Setup: **This test requires four radios and two working channels.**

Disable channels (if necessary) until there are two working channels at the site. Set the radio according to the table below. This test is to be run with no other users on the system and at intervals as set in the Recent Caller Interval (a time of greater than 10 seconds is recommended for the test which is configurable in the Traffic Controller module). This will only work if preformed quickly.

Description	Radio LID	TG Description	TG ID
Radio 1	9980001	TG 64001 P25	64001
Radio 2	9980002	TG 64002 P25	64002
Radio 3	9980003	TG 64003 P25	64003
Radio 4	9980004	TG 64004 P25	64004

Execution:

1. PTT and release Radio 1 (establish a recent user entry).
2. PTT Radios 3 and 4 and hold on transmit to busy both working channels.
3. PTT and release Radio 2 (queue a call less recent than Radio 1).
4. PTT and release Radio 1 (queue the recent user).
5. Unkey Radio 4
   - Verify that Radio 1 un-queues and transmits.
6. Unkey all radios.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

12.14 Call Priority for Group IDs

Purpose: **This test is set up to demonstrate the system's ability to allow a user with a higher priority to get assigned a channel before a user with a lower priority despite who enter the queue first.**

Expected Results: **This test will verify that a user that has a higher priority will get assigned a channel before users with a lower priority regardless of who entered the queue first. In this test radio 4 should get the first available channel, because it has a higher priority, and radio 3 will get assigned a channel next because it has a lower priority.**

Setup: **This test requires two working channels on the site. Disable channels (if necessary) until there are two working channels on the site. Setup the radio according to the table below. This test is to be run with no other users on the system.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	9980001	TG64001 P25	64001
Radio 2	9980002	TG64002 P25	64002
Radio 3	9980003	TG64004 P25	64003
Radio 4	9980004	TG64003 P25	64004

Execution:

1. PTT Radios 2 and 4 and hold on transmit to busy both working channels.
2. PTT and release Radio 1 (medium priority entry into the queue).
3. PTT and release Radio 3 (high priority entry into the queue).
4. Un-key Radio 4
   - Verify that Radio 3 un-queues and keys.
5. Un-key Radio 2
   - Verify that Radio 1 un-queues and keys.
6. Un-key all radios.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

12.15 Emergency Call Priority for Group IDs in Phase 1

Purpose: **Demonstrate the system's ability to allow a user with a higher priority to get assigned a channel before a user with a lower priority, despite who enters the queue first.**

Expected Results: **This test will verify that a user who has a higher priority will get assigned a channel before users with a lower priority regardless of who entered the queue first. In this test radio 4 should get the first available channel, because it has a higher priority, and radio 3 will get assigned a channel next because it has a lower priority.**

Setup: **This test requires two working channels on the site. Disable channels (if necessary) until there are two working channels on the site. Setup the radio according to the table below. This test is to be run with no other users on the system.**

Description	Radio LID	TG Description	TG ID
Radio 1	9980001	TG 64001 P25	64001
Radio 2	9980002	TG 64002 P25	64002
Radio 3	9980003	TG 64003 P25	64003
Radio 4	9980004	TG 64004 P25	64004

Execution:

1. PTT Radios 4 and 3 and hold on transmit to busy both working channels.
2. PTT and release Radio 2 (high priority entry into the queue).
3. Declare an emergency on Radio 1 (medium priority entry into the queue but now at Emergency Priority).
4. Un-key Radio 4
   - Verify that Radio 1 un-queues and is assigned a channel without having to PTT. (Key the radio within the specified auto key time in order to keep the channel.)
5. Un-key all radios and clear the emergency with the Radio 1.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

12.16 Group Scan

Purpose: **Verify when scan is enabled, calls from groups in the radio's scan list are received.**

Expected Results: **In this test the radio will play calls from multiple talk groups while scan is enabled**

Setup: **All radios for this test need to have scan ability.**

Radio 1 set up with TG64001 P25 and TG64002 P25 in the scan list, TG64001 P25 selected, and Group scan initially disabled.

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64002 P25	64001

Execution:

1. Place a call from Radio 2 on talk TG64001 P25.
   - ☐ Verify the call is received and audio is heard on Radio 1.
2. Place a call from Radio 2 on talk TG64002 P25.
   - ☐ Verify the call is not received by Radio 1.
3. Enable group scan on Radio 1.
4. Place another call from Radio 2 on talk TG64002 P25.
   - ☐ Verify that the call is now received and audio is heard on Radio 1.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

12.17 Priority Scan

Purpose: **Demonstrate groups assigned a higher priority in the scan list override groups of a lower priority.**

Expected Results: **Radio will play calls with a higher level of priority.**

Setup: Set Radio 1 to priority scan TG64001 P25, and scan (at lower priority – 3 bars) TG64002 P25. Set Radio 1 to TG64003. Have scan enabled on Radio 1.

Description	Radio LID	TG Description	TG ID
Radio 1 (SCAN)	9980001	TG 64003 P25	64003
Radio 2	9980002	TG 64002 P25	64002
Radio 3	9980003	TG 64001 P25	64001

Execution:

1. Have Radio 1 selected to TG64003 P25. Place a call from Radio 2 on TG64002 P25.
   - ☐ Verify Radio 1 scans to TG64002 P25 and hears audio from Radio 2. Continue transmitting from Radio 2.

2. Place a call from Radio 3 on TG64001 P25. [Radio 2 is still transmitting on TG64002 P25.]
   - ☐ Verify Radio 1 priority scans to TG64001 P25 and hears audio from Radio 3.

3. Unkey all radios, and turn off scan.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

12.18 Transmit Busy Lockout

Purpose: **Demonstrate a radio cannot key on a group, on which a group call is already active.**

Expected Results: **A radio will not be allowed to transmit on a talk group while a different radio is transmitting on the same talk group.**

Setup: **Talk group used for test must be set up as Transmission Trunked. This feature does not apply to Message Trunked calls.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64001 P25	64001

Execution:

1. Place a call from Radio 1 on selected talk group by pressing and holding the PTT button.

   ☐ Verify the call is received and audio is heard on Radio 2.

2. While the call is in progress, press the PTT button on Radio 2.

   ☐ Verify that Radio 2 does not transmit over (step on) the call in progress. (A double bump busy sound will be heard).

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

12.19 Continuous Control Channel Update

Purpose: **This test will demonstrate that a radio will join a call that is already in progress**

Expected Results: **This test will verify that a radio will join a call that is already in progress.**

Setup:

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64001 P25	64001

Execution:

1. Set both radios to the test group.
2. Turn radio 2 OFF.
3. Key radio 1 and hold. Turn ON the radio 2 (and set it to the test group if necessary).
   - ☐ Verify that the second radio joins the call in progress and hears audio from the call in progress.
4. Unkey radio 1.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

12.20 Convert to Callee

Purpose: **Demonstrate when radios are simultaneously keyed, only one radio is given talk privilege.**

Expected Results: **When two radios on the same talkgroup are keyed simultaneously, only one radio will receive access to the working channel. The other radio will play the audio from the first.**

Setup: **Test of single site simultaneous call arbitration.**
Radio 1 and Radio 2 are registered on the same site and TG.

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64001 P25	64001

Execution:

1. Set two radios to the same site and group.
2. Key both radios at the same time.
   - ☐ Verify that one radio ends up transmitting and the other ends up receiving.
   - ☐ Verify that the call audio is routed and received by one of the units even though the PTT is pressed.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

12.21 Multi-site Routing (for Multi-site Logout)

Purpose: **Demonstrate the system will not route a call to a site if all the radios logged into the site have moved to a different site.**

Expected Results: **When the radio moves away from a site, the system will not route calls to the site that it has roamed away from.**

Setup: **Site 1 and 2 should be selected such that Radio 2 can log into Site 1 and then Site 2. If coverage prevents this, then program a third radio with the ID of Radio 2. Use the third radio to key on Site 1 with the ID of Radio 2 whenever the test procedure calls for this. The primary objective of this test is to demonstrate that the system routes calls to Site 2 whenever a unit (i.e. radio 2) is logged onto Site 2 and does not route calls to Site 2 when no units are logged into Site 2. Radio 1 logged in to Site 1 and Radio 2 logged into Site 2.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG641001 P25	64001
Radio 2	998002	TG641001 P25	64001

Execution:

1. Key Radio 1 on Site 1.
   - ☐ Verify channel assignments occur on Site 2. Un-key radio.
2. Switch Radio 2 to site 1.
3. Key Radio 1 on site 1.
   - ☐ Verify no channel assignment on site 2

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

12.22 Site Trunking (Failsoft) Indication

Purpose: **Demonstrate that radio displays a Failsoft Icon, when the site is unable to communicate with the system/network.**

Expected Results: **This test will verify that the radio will display an 'F' when the site it is logged into is not connected to the system.**

Setup: **Radios must be programmed to display Failsoft.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID	Site #
Radio 1	998001	TG641001 P25	64001	1
Radio 2	998002	TG641001 P25	64001	1
Radio 3	998003	TG641001 P25	64001	2

Execution:

1. PTT Radio 1

   ☐ Verify that the Radio 1, Radio 2, and Radio 3 can communicate on the system.

2. Disconnect the network connection from the Network Switching Center to the Site Router, causing loss of communication from the site back to the Network Switching Center.

   ☐ Verify that Radio 1 and Radio 2 indicate a Failsoft alarm ("F") on their displays this may take several minutes.

3. PTT Radio 1 on Talkgroup A. Verify audio is heard at Radio 2. Verify audio is not heard on Radio 3.

4. Re-connect the network from the Network Switching Center to the Site Router.

   ☐ Verify the Failsoft alarm disappears on the radios and that communications with Radio 3 is reestablished.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

12.23 Unconfirmed Call (Multisite Late-Enter)

Purpose: **Verify a radio will late enter an ongoing group call made from another site.**

Expected Results: **A radio creates demand for talkgroups even when no channels are available at a site. Ongoing calls on a talkgroup will be joined as channel resources become available.**

Setup: **Site 1 should only have one working channel, disable all other working channels at site 1.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID	Site #
Radio 1	998001	TG64001 P25	64001	1
Radio 2	998002	TG64002 P25	64002	1
Radio 3	998003	TG64001 P25	64001	2
Radio 4	998004	TG64001 P25	64001	2

Execution:

1. Key up radio 2 on site 1, and hold the call up.

2. Key up Radio 3 on TG64001 on Site 2, and hold the call up.
   a. Verify that Radio 3 should get the grant tone and the call should go through to Radio 4 on Site 2.
   - Since Site 1 has no channels available, the call should not go through to Radio 1 on Site 1.

3. While Radio 2 is still keyed up, free up a channel on Site 1 by unkeying radio 2.
   - Verify that the call gets routed to Site 1 and that Radio 1 late-enters into the call on that site.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

12.24 Confirmed Call

Purpose: **This test will demonstrate that the system will allow confirmed calls.**

Expected Results: **When a radio attempts PTT it will get a wait tone until there are available channels at all site that have demand for the call, or the confirmed call timer expires.**

Setup: **Additional radios maybe required for this test, this test requires two more radios than the number of channels available at the site to be tested.**

Site 1 should only have one working channel, disable all other working channels at site 1.

Radio Description	Radio Lid	Talk Group Description	Talk Group ID	Site #
Radio 1	998001	TG64001 P25	64101	1
Radio 2	998002	TG64002 P25	64002	1
Radio 3	998003	TG64001 P25	64101	2
Radio 4	998004	TG64001 P25	64101	2

Execution:

1. Key up Radio 2 on site 1, and hold the call up.
2. Key up Radio 3 on TG64001 on Site 2, and hold the call up.
   - The call will not be granted because there are no available channels on site 1.
3. Hold the call up until the confirmed call timer expires.
   - Once the timer expires the call will go through but only to site 2 only
4. While Radio 2 is still keyed up, free up a channel on Site 1 by unkeying radio 2.
   - Verify that the call gets routed to Site 1 and that Radio 1 late-enters into the call.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

13. LOCAL EMERGENCY CHANNEL ASSIGNMENT

13.1 Local Emergency Multisite Phase 1 System (FDMA) [Non Single Cell Simulcast/Multisite Only]

Purpose: **This test is set up to demonstrate the multisite FDMA emergency channel assignment.**

Expected Results: **This test will verify that the system will not drop a channel to assign a channel an emergency in FDMA mode.**

Setup: **This test requires six radios and two working talk paths on the site. Disable channels (if necessary) until there is only two working talk paths on the site.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID	Site #
Radio 1	9980001	TG64101 P25	64101	1
Radio 2	9980002	TG64102 P25	64102	1
Radio 3	9980003	TG64103 P25	64103	1
Radio 4	9980004	TG64101 P25	64101	2
Radio 5	9980005	TG64102 P25	64102	2
Radio 6	9980006	TG64103 P25	64103	2

Execution:

1. Disable channels at site 1 and 2 so that only the site only has two working FDMA talk paths.
2. PTT Radio 1 & 2 to busy up the sites.
3. Declare an emergency on Radio 3.
   - Radio 3 Should enter the Queue.
4. Un-key Radio 4
   - Verify Radio is assigned the call
5. Un-key all radios and clear the emergency with the Radio 1.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

13.2 Local Emergency Multisite Phase 2 (TDMA)

Purpose: **This test is set up to demonstrate the multisite TDMA local emergency channel assignment.**

Expected Results: **This test will verify that the system will drop a local channel to assign a channel an emergency in TDMA mode.**

Setup: **This test requires six radios and two working talk paths on the site. Disable channels (if necessary) until there is only two working talk paths on the site.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID	Site #
Radio 1	9980001	TG64151 P25	64151	1
Radio 2	9980002	TG64152 P25	64152	1
Radio 3	9980003	TG64153 P25	64153	1
Radio 4	9980004	TG64151 P25	64151	2
Radio 5	9980005	TG64152 P25	64152	2
Radio 6	9980006	TG64153 P25	64153	2

Execution:

1. Disable channels at site 1 and 2 so that only the site only has two working TDMA talk paths.
2. PTT Radio 1 & 2 to busy up the sites.
3. Declare an emergency on Radio 3.
   - ☐ Verify call is dropped to Radio 1 and tone is heard
   - ☐ Verify Radio 3 is assigned a channel / one TDMA slot.
   - ☐ Verify a console hears calls from Radio 2 and 3
4. Un-key all radios and clear the emergency with the Radio 1.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

13.3 Remote Emergency Multisite System Phase 2 (TDMA)

Purpose: **This test is set up to demonstrate the multisite TDMA emergency channel assignment.**

Expected Results: **This test will verify that the system will not drop a remote channel to assign a channel an emergency in TDMA mode.**

Setup: **This test requires six radios and two working talk paths on the site. Disable channels (if necessary) until there is only two working talk paths on the site.**

Description	Radio LID	TG Description	TG ID	Site
Radio 1	9980001	TG 64151 P25	64151	1
Radio 2	9980002	TG 64152 P25	64152	1
Radio 3	9980003	TG 64153 P25	64153	1
Radio 4	9980004	TG 64151 P25	64151	2
Radio 5	9980005	TG 64152 P25	64152	2
Radio 6	9980006	TG 64153 P25	64153	2

Execution:

1. Disable channels at site 1 and 2 so that only the site only has two working TDMA talk paths.
2. PTT Radio 4 & 5 to busy up the sites.
3. Declare an emergency on Radio 3.
   - ☐ Verify audio is dropped to Radio 1
   - ☐ Verify calls from radio 4 and 5 continue
   - ☐ Verify Radio 3 is assigned a channel
   - ☐ Verify a console hears calls from Radio 3, 4 and 5
4. Un-key all radios and clear the emergency with the Radio 1.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

14. TRANSCODER TEST

Purpose: **This test will demonstrate the transcoder ability to transcode calls made with different vocoders**

Expected Results: **This test will verify that the transcoder is needed to transcode a call, and each transcoder will transcode calls.**

Setup:

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	9980001	TG 64400OS	64400
Console 9110	9989110	TG 64400OS	64400

Execution:

1. Shutdown s0u1xcda.vida.local, s0u2xcda.vida.local and s0u1xcdb.vida.local.

Transcoder	State
s0u1xcda.vida.local	Off
s0u2xcda.vida.local	Off
s0u1xcdb.vida.local	Off

2. From the console place a call on talk group 64400OS
   - Verify that the call is not heard on a P25 radio on talk group 6400OS, this called failed because there is no working transcoder.

3. Restart s0u1xcda.vida.local.

Transcoder	State
s0u1xcda.vida.local	On
s0u2xcda.vida.local	Off
s0u1xcdb.vida.local	Off

4. From the console place a call on talk group 64400OS
   - Verify that the call is heard on a P25 radio

5. Restart s0u2xcda.vida.local wait for 15 minutes for services to start

6. Shutdown s0u1xcda.vida.local.
7.

Transcoder	State
s0u1xcda.vida.local	Off
s0u2xcda.vida.local	On
s0u1xcdb.vida.local	Off

8. From the console place a call on talk group 64400OS
   - Verify that the call is heard on a P25 radio on talk group 6400OS this call is using s0u2xcda.vida.local.

9. Restart s0u1xcdb.vida.local

10. Shutdown s0u1xcda.vida.local

Transcoder	State
s0u1xcda.vida.local	Off
s0u2xcda.vida.local	Off
s0u1xcdb.vida.local	On

11. From the console place a call on talk group 64400OS
    - Verify that the call is heard on a P25 radio on talk group 6400OS this call is using s0u3xcda.vida.local.

12. Restart s0u2xcda.vida.local and s0u1xcda.vida.local

13. From the console place a call on talk group 64400OS verify that the call is heard on a P25 radio on talk group 6400OS

Transcoder	State
s0u1xcda.vida.local	On
s0u2xcda.vida.local	On
s0u1xcdb.vida.local	On

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

15. P25 PHASE 2 FUNCTIONALITY (Single Site/Simulcast Single Site)

Purpose: **The tests below verify that the P25 Phase 2 implementation provides the additional traffic channel capacity and features of P25 Phase 2 while allowing backwards compatibility with Phase 1 radios and talkgroups.**

Expected Results: **This will verify that a P25 Phase 1 call will work on a Phase 2 system**

Setup: **In the following tests, portables 1 and 2 will be set up as Phase 1 only. Portables 3 and 4 will be set up as Phase 2 and Phase 1 capable, depending upon talk-group. FDMA refers to Phase 1 and TDMA refers to Phase 2. Start a session on the RNM and setup to watch channel assignments using the real time viewer function.**

On a client computer, open the windows internet explorer and browse to https://s0u1rnm.vida.local/nmc and log in with an Active Directory account. Choose the system map and select the 'Launch Application' button. Open the Realtime tab and Click Site Calls. Select the site and expand. Check the box next to the channels and select the to add the channels to the target list. Select the 'ok' button to launch the application. Place a group call from Radio 1 to Radio 2 on the site, and verify that the event viewer displays the talkgroup ID and calling party ID. Verify the state changes from Free to Talk. Verify the TG Alias displays the Group #.

Radio Description	Radio Lid	Talk Group Description	Talk Group ID	System
Radio 1	998001	TG64051 P25	64051	MAC PH 1
Radio 2	998002	TG64051 P25	64051	MAC PH 1
Radio 3	998003	TG64051 P25	64051	MAC PH 2
Radio 4	998004	TG64051 P25	64051	MAC PH 2

15.1 Mixed Mode site to Mixed Mode site Call Phase 1- Phase 1

Purpose: **Demonstrates that a Phase 1 call will work on a Phase 2 system**

Expected Results: **This will verify that a P25 Phase 1 call will work on a Phase 2 system**

Setup: **Turn off radios 3 and 4.**

Execution:

1. PTT Radio 1 and talk. The transmit (TX) indicators should turn on at Radio 1

   - ☐ Verify that the call is assigned as an FDMA by viewing the Real Time Viewer Site Activity on the RNM.

   - ☐ Verify Radios 2 can hear Radio 1.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

15.2 Mixed Mode site to Mixed Mode site Call - Phase 1 and Phase 2

Purpose: **Demonstrates that a mixed mode call can function on a Phase 2 system**

Expected Results: **This test will verify that a Phase 2 radio will hear a call from a Phase 1 radio.**

Setup: **Turn on Radios 1, 2, 3, 4**

Execution:

1. PTT Radio 1 and talk. The transmit (TX) indicators should turn on at Radio 1

   - ☐ Verify that the call is assigned as an FDMA by viewing the Real Time Viewer Site Activity on the RNM.

   - ☐ Verify Radios 2, 3 and 4 can hear Radio 1.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

15.3 Mixed Mode site to Mixed Mode site Call - Phase 1

Purpose: **Demonstrates that a mixed mode call can function on a Phase 2 system**

Expected Results: **This test will verify that a Phase 1 radio will hear a call from a Phase 2 radio.**

Setup: **Turn on Radios 1, 2, 3, 4**

Execution:

1. PTT Radio 3 and talk. The transmit (TX) indicators should turn on at Radio 3

   - ☐ Verify that the call is assigned as an FDMA by viewing the Real Time Viewer Site Activity on the RNM.

   - ☐ Verify Radios 1, 2 and 4 can hear Radio 3.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

15.4 Phase 2 site Call

Purpose: **Demonstrates that a Phase 2 call work on a Phase 2 system**

Expected Results: **This will verify that a P25 Phase 2 call will work on a Phase 2 system**

Setup: **Turn off Radios 1, and 2**

Execution:

1. PTT Radio 3 and talk. The transmit (TX) indicators should turn on at Radio 3

   - ☐ Verify that the call is assigned as an TDMA by viewing the Real Time Viewer Site Activity on the RNM.

   - ☐ Verify Radios 4 can hear Radio 1.

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

16. P25 PHASE 2 FUNCTIONALITY

Purpose: **The tests will show that the system will allow radios that are on different sites to communicate while the radios are on different phases on P25.**

Expected Results: **This test will verify that the system will allow Phase 1 and Phase 2 radio to inter communicate.**

Setup: **In the following tests, portables 1 and 2 will be set up as Phase 1 only. Portables 3 and 4 will be set up as Phase 2 and Phase 1 capable, depending upon talk-group. FDMA refers to Phase 1 and TDMA refers to Phase 2. Start a session on the RNM and setup to watch channel assignments using the real time viewer function.**

On a client computer, open the windows internet explorer and browse to https://s0u1rnm.vida.local/nmc and log in with an Active Directory account. Choose the system map and select the 'Launch Application' button. Open the Realtime tab and Click Site Calls. Select the site and expand. Check the box next to the channels and select the to add the channels to the target list. Select the 'ok' button to launch the application.

Place a group call from Radio 1 to Radio 2 on the site, and verify that the event viewer displays the talk-group ID and calling party ID. Verify the state changes from Free to Talk. Verify the TG Alias displays the Group #.

Radio Description	Radio Lid	Talk Group Description	Talk Group ID	System	Site	On/Off
Radio 1	998001	TG64051 P25	64051	MAC PH 1	1	On
Radio 2	998002	TG64051 P25	64051	MAC PH 1	1	On
Radio 3	998003	TG64051 P25	64051	MAC PH 2	2	On
Radio 4	998004	TG64051 P25	64051	MAC PH 2	2	On

16.1 Mixed Mode site to Mixed Mode site Call Phase 1- Phase 1

Purpose: **Demonstrates that a Phase 1 call work on a Phase 2 system**

Expected Results: **This will verify that a P25 Phase 1 call will work on a Phase 2 system**

Setup: **Turn off radios 2 and 4.**

Description	Radio LID	TG Description	TG ID	System	Site	On/Off
Radio 1	9980001	TG 64051 P25	64051	MAC PH 1	1	On
Radio 2	9980002	TG 64051 P25	64052	MAC PH 2	1	Off
Radio 3	9980003	TG 64051 P25	64051	MAC PH 1	2	On
Radio 4	9980004	TG 64051 P25	64052	MAC PH 2	2	Off

Execution:

1. PTT Radio 1 and talk.

   - ☐ The transmit (TX) indicators should turn on at Radio 1
   - ☐ Verify that the call is assigned as FDMA at Site 2 by viewing the Real Time Viewer Site Activity on the RNM.
   - ☐ Verify Radio 3 can hear Radio 1.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

16.2 Mixed Mode site to Mixed Mode site Call - Phase 1 and Phase 2

Purpose: **Demonstrates that a mixed mode call can function on a Phase 2 system**

Expected Results: **This test will verify that Phase 2 radios will hear a call from a Phase 1 radio.**

Setup: **Turn on Radios 1, 2, 3, 4**

Description	Radio LID	TG Description	TG ID	System	Site	On/Off
Radio 1	9980001	TG 64051 P25	64051	MAC PH 1	1	On
Radio 2	9980002	TG 64051 P25	64051	MAC PH 1	1	On
Radio 3	9980003	TG 64051 P25	64051	MAC PH 2	2	On
Radio 4	9980004	TG 64051 P25	64051	MAC PH 2	2	On

Execution:

1. PTT Radio 1 and talk.

   - ☐ The transmit (TX) indicators should turn on at Radio 1
   - ☐ Verify that the call is assigned as an FDMA at site 2 by viewing the Real Time Viewer Site Activity on the RNM.
   - ☐ Verify Radios 2, 3 and 4 can hear Radio 1.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

16.3 Mixed Mode site to Mixed Mode site Call - Phase 1

Purpose: **Demonstrates that a mixed mode call can function on a Phase 2 system.**

Expected Results: **This test will verify that a Phase 1 radio will hear a call from a Phase 2 radio.**

Setup: **Turn on Radios 1, 2, 3, 4**

Description	Radio LID	TG Description	TG ID	System	Site	On/Off
Radio 1	9980001	TG 64051 P25	64051	MAC PH 1	1	On
Radio 2	9980002	TG 64051 P25	64051	MAC PH 1	1	On
Radio 3	9980003	TG 64051 P25	64051	MAC PH 2	2	On
Radio 4	9980004	TG 64051 P25	64051	MAC PH 2	2	On

Execution:

1. PTT Radio 3 and talk.

   - ☐ The transmit (TX) indicators should turn on at Radio 3
   - ☐ Verify that the call is assigned as an FDMA at site 2 by viewing the Real Time Viewer Site Activity on the RNM.
   - ☐ Verify Radios 1, 2 and 4 can hear Radio 3.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

16.4 Phase 2 site Call

Purpose: **Demonstrate that a Phase 2 call works on a Phase 2 system.**

Expected Results: **Verify that a P25 Phase 2 call will work on a Phase 2 system.**

Setup: **Turn off Radios 1 and 2**

Description	Radio LID	TG Description	TG ID	System	Site	On/Off
Radio 1	9980001	TG 64051 P25	64051	MAC PH 1	1	Off
Radio 2	9980002	TG 64051 P25	64051	MAC PH 1	1	Off
Radio 3	9980003	TG 64051 P25	64051	MAC PH 2	2	On
Radio 4	9980004	TG 64051 P25	64051	MAC PH 2	1	On

Execution:

1. PTT Radio 3 and talk.

   - ☐ The transmit (TX) indicators should turn on at Radio 3
   - ☐ Verify that the call is assigned as a TDMA at Site 1 by viewing the Real Time Viewer Site Activity on the RNM.
   - ☐ Verify Radios 1, 2, & 4 can hear Radio 3.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

17. SYMPHONY DISPATCH FEATURE SET

All Testing done in this section should be done with a user that is in the 'Console' User Group.

17.1 Transmitting With a Microphone (Group Calls, I Calls)

Purpose:	**Confirms the console operator can initiate communication with a terminal radio using the console select functions and foot pedal, for both Group and I Calls.**
Expected Results:	**Confirms communication with the terminal radio**
Setup:	**Radio set to TG64001 P25 and console programmed with talk groupTG64001 P25**

Execution:

1. Press the INSTANT TX function (for example right mouse button) on the module with the test group. Verify
   - ☐ that a channel access tone is heard, a
   - ☐ ripple effect on the 'TX' indicator is displayed
   - ☐ that the call is heard on the radio.
2. Release the Instant TX key
3. Right click on the gear symbol for TG64002 and select 'Select' to make TG64002 the selected talk group. Verify
   - ☐ that the module for TG64002 is highlighted indicating that it is the selected talk group
   - ☐ the module at the top center of the screen changes to 'TG64002'
4. Make call on 64002TG by:
   a. Press the PTT foot pedal.
      - ☐ verify that a channel access tone is heard,
      - ☐ the halo around the 'TX' indicator is displayed
      - ☐ that the call is heard on the radio
      - ☐ verify audio is head at a radio on talk group 64002TG

      i. Release the foot pedal to end the call

   b. Press the headset button.

- ☐ verify that a channel access tone is heard
- ☐ the halo around the 'TX' indicator is displayed
- ☐ that the call is heard on the radio
- ☐ verify audio is head at a radio on talk group 64002TG

i. Release the headset button to end the call.

c. Select the 64002TG button with the mouse.

- ☐ verify that a channel access tone is heard
- ☐ the halo around the 'TX' indicator is displayed
- ☐ that the call is heard on the radio
- ☐ verify audio is head at a radio on talk group 64002TG

i. Release the mouse button to end the call.

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

17.2 Receiving Calls (Unit ID Display, Talk group ID Display, Aliasing)

Purpose:	**Confirm the console operator can receive communications from a terminal radio, using both talkgroup and individual calling.**
Expected Results:	**Communications are initiated and received on the appropriate speaker (select or unselect) and the radio's ID is displayed.**
Setup:	**Console should have talk groups 64001TU and 64002TU programmed with 64002TU selected and Radio set to TG64001 P25**

17.2.1 Talk Group Call

Execution:

1. Key the radio and verify
   - ☐ That the call is heard at the unselect speaker
   - ☐ That the calling radio ID is displayed on the module for TG64001
   - ☐ A green light id displayed indicating an incoming call on module TG64001
2. Switch the radios talk group to 64002TU and key the radio.
   - ☐ That the call is heard at the select speaker
   - ☐ That the calling radio ID is displayed on the module for TG64002
   - ☐ A green light id displayed indicating an incoming call on module TG64002

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

17.2.2 Individual Call (Unit – Unit)

Execution:

1. Right click on the 'Harris' box on the top left hand side of the screen.
2. Select 'Open Directory' this will open a pop up window for the 'Directory'
3. Select the 'Users' tab
4. Select 'Radio 1' under the "ALIAS' column
5. Press the 'Radio 1' button the right side to the screen to place an individual call to radio 1.
   - ☐ Verify the ripple effect on the 'TX' indicator is displayed
   - ☐ Verify a ringing tone will be heard at the console and the radio
   - ☐ Verify radio displays 'INDV' and consoles 'ID"
6. Respond to the console by PTTing the radio
   - ☐ Verify that the call is heard on the console and that the calling radio's ID and the Call Indicator are displayed.

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

17.3 Emergency Call and Emergency Alarm

Purpose: **Confirms the console indicates an emergency declared by a terminal radio and can reset and clear the emergency.**

Expected Results: **The console indicates and can clear the emergency.**

Setup: **This test requires a test radio capable of generating and clearing an emergency (i.e. Supervisor Radio).**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001

Execution:

1. Select the 64002TG in the console. Using the test radio, declare an emergency on 64001TG.
   - ☐ Verify the module for ‘64001TG’ turns red,
   - ☐ Verify the ID/Name of the test radio is displayed
   - ☐ Verify emergency alert tone is heard on the console.
2. Select the triangle with a ‘!’ to access the emergency menu.
   - ☐ the acknowledge ‘Ack’ button is red
   - ☐ the check box is red
3. Using the radio, transmit on the talk group
   - ☐ Verify that the call is received by the console.
4. With the console, transmit on the group with the emergency.
   - ☐ Verify the test radio receives the call, and is still in emergency mode.
5. Acknowledge the emergency by selecting the ‘Ack’ button
   - ☐ Verify the button changes from ‘Ack’ to clear
   - ☐ verify the radio and the console are still in emergency mode
6. Clear the emergency by selecting the ‘Clear X’ button

- ☐ Verify the console clears the emergency
- ☐ Verify the radio clears the emergency

7. Transmit on the radio
8. Verify the emergency is cleared and normal group calls have resumed.
9. Select 64001TG group selected on the console, declare an emergency on the test group by pressing the 'Emer Declare'.
   - ☐ Verify the console and radio have the same indications as steps 2 to 4.
10. Acknowledge by hitting 'Ack' in step 4
11. Clear the emergency with the console.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

17.4 System Wide Call (All Call & Announcements)

Purpose: **Confirm the console can initiate system wide calls.**

Expected Results: **The console can initiate both All Calls and Announcement Calls.**

Setup: **Program console modules with the 'TG64000 P25' talk group**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64051 P25	64051
Radio 2	998002	TG64052 P25	64052
Radio 3	998003	TG64001 P25	64001
Radio 4	998004	TG64001 P25	64002

Execution:

1. Press INSTANT TX on the module with 'TG64000 P25'.
   - ☐ Verify that a channel access tone is heard,
   - ☐ Verify the ripple effect on the 'TX' indicator is displayed
   - ☐ Verify that the call is heard at all radios
2. Release the Instant TX key.
3. Press INSTANT TX on the module with 'TG64051 P25'.
   - ☐ Verify that a channel access tone is heard,
   - ☐ Verify the ripple effect is displayed
   - ☐ Verify the call is heard at Radios 1.
   - ☐ Verify radios 2, 3 and 4 did not hear the audio.
4. Release the Instant TX key.
5. Press INSTANT TX on the module with 'TG64001 P25'.
   - ☐ Verify that a channel access tone is heard,

- ☐ The ripple effect is displayed,
- ☐ The call is heard at Radios 3.
- ☐ Verify that Radios 1, 2 and 4 did not hear the audio.

6. Release the Instant TX key.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

17.5 Alert Tones

Purpose: **Confirm the console can initiate alert tones which can be heard at the terminal radio.**

Expected Results: **The tones can be initiated and heard.**

Setup: **Console 1 programmed with TG64002 and TG64001 selected.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64002 P25	64002

Execution:

1. Make TG64001 P25 the selected talk group.
2. Select the tones tab on the talk group module.
3. Select one of the three ALERT TONE keys by selecting the drop down list next to the orange button the console with a method other than the mouse.
4. Radio 1 will receive the call.
5. Test that all three alert tones can be heard on the radio.
   - ☐ Verify the ALERT TONE is received by Radio 1 and also heard on the console (to hear the tones on the console, press and hold the foot pedal and listen for the tone on the SELECT speaker).
6. When the ALERT TONE key is released
   - ☐ Verify the call on Radio 1 drops

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

17.6 Console Pre-Empt

Purpose: **Confirm the console can pre-empt an ongoing call between terminal radios.**

Expected Results: **The call started by the radio will be interrupted by the console.**

Setup: **Console 1 programmed with talk-group TG64001 P25**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	9981001	TG64001 P25	64001
Radio 2	9981002	TG64001 P25	64001

Execution:

1. Key Radio 1 on the TG64001 and hold the call up. Verify that audio is heard at Radio 2 and the console.

2. Key the console on TG64001and hold the while continuing to hold the call up on Radio 1

   - ☐ Verify the console pre-empts
   - ☐ Verify that the transmit indicator is displayed along with the pre-empted caller LID and CALL indicator
   - ☐ Verify that the second radio begins to hear the console audio and not the first radio call.
   - ☐ Verify that the pre-empted radio audio is still heard on the pre-empting console.

3. Un-key the first Radio.

   - ☐ Verify that the pre-empted caller LID and CALL indicators are removed and the pre-empted radio audio is no longer heard on the pre-empting console.

4. Un-key the console.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

17.7 Simulselect

Purpose: **Confirms operation of the console Simulselect feature, which allows multiple talk groups to be selected for communication simultaneously.**

Expected Results: **The console can select multiple talk groups and communication is allowed.**

Setup **Console 1 programmed with talk groups TG64051 P25, TG64052 P25, TG64053 P25, and TG64054 P25.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64051 P25	64051
Radio 2	998002	TG64052 P25	64052
Radio 3	998003	TG64001 P25	64001
Radio 4	998004	TG64001 P25	64002

Execution:

1. Create simulselect group on the 4 test group modules
2. Place a call from the console on the simulselect group
   - ☐ Verify that the call is heard all four radios
3. Place a call from each radio
   - ☐ Verify that only the console hears the calls
   - ☐ Verify only the radios on similar talk groups here the call
4. Deactivate the simulselect group.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

17.8 Patch

Purpose: **Confirms the console patch feature creates shared communication between multiple selected talk groups.**

Expected Results: **The patched talk groups can communicate.**

Setup **Console 1 programmed with talk groups TG64051 P25, TG64052 P25, TG64053 P25, and TG64054 P25.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64051 P25	64051
Radio 2	998002	TG64052 P25	64052
Radio 3	998003	TG64001 P25	64001
Radio 4	998004	TG64001 P25	64002

Execution:

1. Create patch on PATCH 1 with all four groups above.
2. Place a call from the newly created patch
   - Verify that the call is heard on all the radios
3. Place a call from each radio
   - Verify that the call is heard on the console and each radio.
4. Deactivate the patch.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

17.9 Console to Console Cross-mute

Purpose: **Confirm creation of a cross-mute of another console to quiet the muted consoles audio on the local console.**

Expected Results: **The cross-muted console's audio cannot be heard on the local console.**

Setup: **Establish two consoles (A and B) to test the Crossmute function. The Consoles must be on the same NSC. Program and select a test group on both consoles.**

Execution:

1. Place a call on console A on the test group.
   - ☐ Verify that console B can hear console A.
2. Open the Symphony Configuration Utility for console B in the 'General' section add the ID for console A to the 'Cross Mute' list.
3. Select 'Apply' to save the changes.
4. Place a call on console A on the test group
   - ☐ Verify the call can't be heard at console B.
5. Restore the desired cross mute setup.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

17.10 Call History

Purpose: **Confirms a history of calls processed at the console.**

Expected Results: **The history is accessible and valid.**

Setup: **This test compares programmed module call activity to the history scroll lists. Utility page, dispatch menu will be selected. Select either the "Select History" or "Unselect History".**

Execution:

1. Press the 'Scroll Up' and 'Scroll Down' buttons to scroll through the Unselect call history list.
   - Compare these calls with known activity.
2. Press the 'Scroll Up' and 'Scroll Down' buttons to scroll through the selected call history list.
   - Compare these calls with known activity.
3. Press the 'Esc' button to exit the history scroll mode.
4. To monitor call history on a single group use the 'module history' button on the 'module modify' menu.
5. Use the 'scroll up' and 'scroll down' buttons to scroll through the calls for the picked module.
   - Compare these calls with known activity.

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

17.11 Group Call

Purpose: **Confirms the scan function which allows a smartphone to hear audio on selected talk-groups other than the current talk-group.**

Expected Results: **Selected talk-group call audio is heard.**

Setup: **Set smart-phones 1, 2, & 3 to (Group A) per test group structure. Make sure Scan is turned OFF.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
BeOn_202	998202	TG64151 P25	64151
BeOn_203	998203	TG64151 P25	64151
BeOn_204	998204	TG64151 P25	64151

Execution:

1. PTT on BeOn_202 and talk.
   - ☐ The transmit (TX) indicators should turn on at BeOn_202.
   - ☐ Audio should be heard in BeOn_203, and BeOn_204.
   - ☐ The ID of BeOn_202 should be seen at BeOn_203, and BeOn_204.
2. Set BeOn_204 to TG64152 P25. PTT on BeOn_202 and talk.
   - ☐ The transmit (TX) indicators should turn on at BeOn_202.
   - ☐ Audio should be heard in BeOn_203 only.
   - ☐ The ID of BeOn_202 should be seen at BeOn_203 only.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

17.12 Individual (Private) Call

Purpose: **Confirms individual calls can be initiated using BeOn enabled smartphones.**

Expected Results: **Individual calls are confirmed.**

Setup:

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
BeOn_202	998202	TG64151 P25	64151
BeOn_203	998203	TG64151 P25	64151
BeOn_204	998204	TG64151 P25	64151

Execution:

1. Using the BeOn_202, select the pre-stored ID of BeOn_203 or enter the BeOn_203 ID directly from the keypad, and PTT smartphone 1.

   - ☐ Verify that BeOn_203 receives the call and displays the ID of smartphone 1.
   - ☐ Verify that BeOn_204 remains idle.

2. Release the PTT on BeOn_202 and immediately PTT on BeOn_203.

   - ☐ Verify that BeOn_202 receives the call and displays the ID of BeOn_203.
   - ☐ Verify BeOn_204 remains idle.

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

17.13 Group Scan

Purpose: **Confirms the scan function which allows a smartphone to hear audio on selected talk-groups other than the current talk-group.**

Expected Results: **Selected talk-group call audio is heard.**

Setup: **BeOn_202 set up with TG64151 P25 and TG64152 P25 in the scan list, TG64151 P25 selected, and group scan initially disabled.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
BeOn_202	998202	TG64151 P25	64151
BeOn_203	998203	TG64151 P25	64151
BeOn_204	998204	TG64151 P25	64151

Execution:

1. Place a call from BeOn_203 on TG64151 P25.
   - ☐ Verify the call is received and audio is heard on BeOn_202.
2. Place a call from BeOn_203 on TG64152 P25.
   - ☐ Verify the call is not received by BeOn_202.
3. Enable group scan on BeOn_202.
4. Place another call from BeOn_203 on TG64152 P25.
   - ☐ Verify that the call is now received and audio is heard on BeOn_202.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

17.14 Emergency Group Call

Purpose: **Confirms an emergency can be declared, recognized and cleared by a smartphone.**

Expected Results: **The emergency is declared, recognized and cleared.**

Setup:

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
BeOn_202	998202	TG64151 P25	64151
BeOn_203	998203	TG64152 P25	64152
BeOn_204	998204	TG64153 P25	64153

Execution:

1. Press the Emergency call button on BeOn_204 and then PTT BeOn_204.

   - ☐ Verify that BeOn_204 indicates the “TX EMER” declaration and that it reverts to the home group.

   - ☐ Verify that BeOn_202 and BeOn_203 indicate a “RX EMER” and hear audio on the emergency home group.

2. Clear the emergency with the Supervisor smartphone (BeOn_202).

   - ☐ Verify the emergency clears in the smartphones.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

18. BEON FEATURES

Purpose: **These will test the BeOn features.**

Expected Results: **This test will demonstrate that BeOn works as designed.**

Setup: **This test will show that the BeOn system allows a smartphone to communicate with the radio system.**

18.1 Transmit Grant Tone

Purpose: **This test will demonstrate the grant tone on BeOn.**

Expected Results: **When the smartphone PTTs on the BeOn app it will play a grant tone.**

Setup: **Grant tone (Ready to Talk tone) enabled in smartphone radio personality.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
BeOn_202	998202	TG64151 P25	64151
BeOn_203	998203	TG64151 P25	64151
BeOn_204	998204	TG64151 P25	64151

Execution:

1. Press PTT button on smartphone with valid group selected.

   - Verify grant tone is heard at smartphone when working channel access is granted.

Note: If the call is queued, the grant tone will be delayed until the call is assigned a working channel.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

18.2 Group Call

Purpose: **Confirms the scan function which allows a smartphone to hear audio on selected talk-groups other than the current talk-group.**

Expected Results: **Selected talk-group call audio is heard.**

Setup: **Set smart-phones 1, 2, & 3 to (Group A) per test group structure. Make sure Scan is turned OFF.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
BeOn_202	998202	TG64151 P25	64151
BeOn_203	998203	TG64151 P25	64151
BeOn_204	998204	TG64151 P25	64151

Execution:

3. PTT on BeOn_202 and talk.
   - ☐ The transmit (TX) indicators should turn on at BeOn_202.
   - ☐ Audio should be heard in BeOn_203, and BeOn_204.
   - ☐ The ID of BeOn_202 should be seen at BeOn_203, and BeOn_204.
4. Set BeOn_204 to TG64152 P25. PTT on BeOn_202 and talk.
   - ☐ The transmit (TX) indicators should turn on at BeOn_202.
   - ☐ Audio should be heard in BeOn_203 only.
   - ☐ The ID of BeOn_202 should be seen at BeOn_203 only.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

18.3 Individual (Private) Call

Purpose: **Confirms individual calls can be initiated using BeOn enabled smartphones.**

Expected Results: **Individual calls are confirmed.**

Setup:

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
BeOn_202	998202	TG64151 P25	64151
BeOn_203	998203	TG64151 P25	64151
BeOn_204	998204	TG64151 P25	64151

Execution:

3. Using the BeOn_202, select the pre-stored ID of BeOn_203 or enter the BeOn_203 ID directly from the keypad, and PTT smartphone 1.

   - ☐ Verify that BeOn_203 receives the call and displays the ID of smartphone 1.
   - ☐ Verify that BeOn_204 remains idle.

4. Release the PTT on BeOn_202 and immediately PTT on BeOn_203.

   - ☐ Verify that BeOn_202 receives the call and displays the ID of BeOn_203.
   - ☐ Verify BeOn_204 remains idle.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	

18.4 Group Scan

Purpose: **Confirms the scan function which allows a smartphone to hear audio on selected talk-groups other than the current talk-group.**

Expected Results: **Selected talk-group call audio is heard.**

Setup: **BeOn_202 set up with TG64151 P25 and TG64152 P25 in the scan list, TG64151 P25 selected, and group scan initially disabled.**

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
BeOn_202	998202	TG64151 P25	64151
BeOn_203	998203	TG64151 P25	64151
BeOn_204	998204	TG64151 P25	64151

Execution:

5. Place a call from BeOn_203 on TG64151 P25.
   - ☐ Verify the call is received and audio is heard on BeOn_202.
6. Place a call from BeOn_203 on TG64152 P25.
   - ☐ Verify the call is not received by BeOn_202.
7. Enable group scan on BeOn_202.
8. Place another call from BeOn_203 on TG64152 P25.
   - ☐ Verify that the call is now received and audio is heard on BeOn_202.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

18.5 Emergency Group Call

Purpose: **Confirms an emergency can be declared, recognized and cleared by a smartphone.**

Expected Results: **The emergency is declared, recognized and cleared.**

Setup:

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
BeOn_202	998202	TG64151 P25	64151
BeOn_203	998203	TG64152 P25	64152
BeOn_204	998204	TG64153 P25	64153

Execution:

3. Press the Emergency call button on BeOn_204 and then PTT BeOn_204.

   - ☐ Verify that BeOn_204 indicates the “TX EMER” declaration and that it reverts to the home group.

   - ☐ Verify that BeOn_202 and BeOn_203 indicate a “RX EMER” and hear audio on the emergency home group.

4. Clear the emergency with the Supervisor smartphone (BeOn_202).

   - ☐ Verify the emergency clears in the smartphones.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

19. TRUNKED LOGGING RECORDER

19.1 Group Call

Purpose: **Confirms group call audio is captured, recorded and accessible on the logging recorder**

Expected Results: **Calls are captured, recorded and accessible.**

Setup:

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64051 P25	64051
Radio 2	998002	TG64051 P25	64051
Radio 3	998003	TG64051 P25	64051

1. PTT radio 1 and talk.

   - ☐ Audio should be heard on radio 2. Note the Start time of the call and the approximate duration.

2. Retrieve the call from the Logging Recorder.

   - ☐ Verify the Caller, Callee, Start Time, and duration.
   - ☐ The Caller should be the LID for Radio 1 and the Callee should be the GID for 64051. Verification should include the LID/GID and its Alias as defined by the UAS.
   - ☐ Verify that the call is identified as a Group Call.

3. Playback the audio

   - ☐ Confirm that the playback audio is all recorded and intelligible.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

19.2 Emergency Group Call

Purpose: **Confirms emergency group call audio is captured, recorded and accessible on the logging recorder**

Expected Results: **Calls are captured, recorded and accessible.**

Setup:

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64051 P25	64051
Radio 2	998002	TG64051 P25	64051
Radio 3	998003	TG64051 P25	64051

Execution:

1. Press the Emergency call button on radio 2. Talk during the Hot Mic transmit time.
2. Clear the emergency with the radio 1.
3. Retrieve the call from the Logging Recorder.
   - Verify the Caller
   - Verify the Callee
   - Verify the start time
   - Verify the duration
   - The Caller should be the LID for Radio 2 and the Callee should be the GID for the Home Group.
   - Verification should include the LID/GID and its Alias as defined by the UAS.
   - Verify that the call is identified as an Emergency.
   - Playback the audio and confirm that it is all recorded and intelligible.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

20. P25 SIMULCAST BYPASS OPERATION

Program the MASTR V modules (both Control Points and Transmit Sites) to the Final Configuration. Refer to the installation manual for the guide to setting TX Traffic Controllers / CP Traffic Controllers personality parameters.

Verify the BYPASS plan has been reviewed and approved by customer representative. This procedure makes assumptions on bypass sites before implementation and test of the System. After WMS/Panther signal strength data collection, final decision will be made on the actual bypass "ON" and "OFF" sites.

Prepare a minimum of two terminal radios programmed to operate on the active BYPASS site and the main simulcast system.

20.1 Site OFF - Final Configuration

Purpose:	**Confirm sites configured to be in the "OFF" condition during BYPASS are in the expected BYPASS mode.**
Expected Results:	**The "OFF" site traffic controllers have no control channel.**
Setup:	**Sites intended to be "OFF" in event of BYPASS must have all channels set to disabled (unchecked in Device Manager, TC personality).**

Execution:

1. At one of the sites designated as an "off" site, create a condition to force BYPASS by disconnecting the router to MPLS connection. All other sites will have the HPAs disabled locally.

   - ☐ Verify transmit site is in BYPASS mode.
   - ☐ The Traffic Controller module display indicates "TC" instead of "TR". Note: TC= Working Traffic Channel, standalone mode, TR=Working Channel, simulcast mode, and Control Channel, simulcast mode is indicated by the transmit LED indicator.

2. Observe the repeater (station) Traffic Controller modules.

   - ☐ Verify there is no active control channel.
   - ☐ Verify no stations are keyed or producing RF power.

3. Restore the site to normal by returning the site to simulcast mode by reconnecting the router to MPLS connection.

   - ☐ Verify transmit site is in normal simulcast mode. The Traffic Controller modules will indicate “TR(n)”, where n is the channel number.

4. Repeat steps 1-3 for the remaining “OFF” bypass sites in the simulcast system under test.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

20.2 Site ON (trunking) - Final Configuration

Purpose: **Confirm sites configured to be in the "ON" condition during BYPASS are in the expected BYPASS mode.**

Expected Results: **The "ON" site traffic controllers have a control channel and calls to terminal radios can be initiated.**

Setup:

Execution:

1. Create a condition to force BYPASS by disconnecting the router to MPLS connection.

   - ☐ Verify transmit site is in BYPASS mode. BYPS LED on Baseband module and the Traffic Controller module display indicates either "TC" or "CC" instead of "TR.
   - ☐ Observe the stations/repeater Traffic Controller modules. Verify there is an active control channel on one of the Traffic Controller modules. The remaining repeater/stations Traffic Controller modules will indicate "TC".
   - ☐ Verify the station appearing as control channel is keyed, producing RF power and modulated with control channel data.
   - ☐ Verify a terminal radio set to the system programmed for the site in BYPASS with the correct site ID recognizes the site's control channel data.

2. Key the terminal radio on a group call.

   - ☐ Verify a working channel assignment is made within the channel group allowed in the personality.
   - ☐ Verify the call is heard on a second terminal radio set to the active BYPASS system.

3. Restore the site to simulcast mode by reconnecting the router to MPLS connection.

   - ☐ Verify transmit site is in normal simulcast mode. Traffic Controller modules indicate "TR(n).

4. Repeat steps 1-3 for the remaining "ON" bypass sites in the simulcast system under test.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

20.3 Control Point Trunking Reset Control

Purpose: **A properly set up Simulcast BYPASS system will disable CP Traffic Controller modules associated with active channels at a TX site operating in BYPASS. This keeps the remaining sites operating in Simulcast mode from being assigned to channels expected to be active at the site in BYPASS. Sites programmed to be OFF in BYPASS will not require any Traffic Controller modules to be held OFF.**

Expected Results: **This test will verify that the Control Point Traffic Controller modules will be held OFF corresponding to the active channels at a site as a result of the TX site being in BYPASS.**

Setup:

Execution:

1. Force a TX site that will become active into BYPASS by disconnecting the router to MPLS connection.

   - ☐ Verify TX site is in BYPASS mode.
   - ☐ Verify transmit site is in BYPASS mode. Traffic Controller module display indicates either “TC” or “CC” instead of “TR”.
   - ☐ Verify the CP Traffic Controller modules on the channels intended to be OFF are held OFF.

2. Observe the RNM screen for the simulcast system.

   - ☐ Verify the channels intended to be OFF at the Control Point are reported as OFF (RED).

3. Restore the site to simulcast mode by reconnecting the router to MPLS connection.

   - ☐ Verify the TX site Traffic Controller modules revert to normal Simulcast.
   - ☐ Verify the CP Traffic Controller modules associated with the site in BYPASS are returned to normal.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

20.4 Bypass – Site Minimum Channels

Purpose:	**Confirm a site enters bypass when active channels fall below site minimum channels setting.**
Expected Results:	**The site enters bypass mode.**
Setup:	**Sites are configured with cluster minimum channels set to 6 and site minimum channels to 7.** **Bypass Plan: TR Site 1 Ch 3,4,5; TR Site 2 Ch 6,7,8; TR site 3 Ch 9,10,11 TR Sites 4 and 5 dark**
Note	**Settings and bypass plan can be customer final settings; execution will have to adjust to accommodate those settings.**

Execution:

1. At TR site 1 disable channels 8 - 11 using the TX disable switch on the PA (only channels 1-7 are still functioning).

   - ☐ Verify system and site still functioning in simulcast; the disabled channels 8-11 are in alarm state at the control point site.
   - ☐ At TR site 1 the Traffic Controller modules displays still indicates “TR” not “TC” or “CC”. Note: TC= Working Traffic Channel, standalone mode, TR=Working Channel, simulcast mode, and Control Channel, simulcast mode is indicated by the transmit LED indicator.

2. At the same site disable channel 7 using the TX disable switch on the PA.

   - ☐ Verify system is still functioning in simulcast. Control Point ch 3,4 and 5 in alarm state.
   - ☐ Verify TR site 1 is in bypass. The Traffic Controller module display indicates “TC” instead of “TR”. All channels status indicates alarm. Note: TC= Working Traffic Channel, standalone mode, TR=Working Channel, simulcast mode, and Control Channel, simulcast mode is indicated by the transmit LED indicator always on.

3. At the same site restore all channels back to service (enable the PA using the TX disable switch on the PA).

   - ☐ Verify transmit site 1 is in normal simulcast mode. The Traffic Controller modules will indicate “TR(n)”, where n is the channel number.
   - ☐ Verify all channels are in service at the control point.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

20.5 Bypass – Cluster Minimum Channels – TR site failures

Purpose: **Confirm all sites enter bypass when available channels fall below the cluster minimum channels setting. Depending upon the system size, bypass plan and which channels have been failed a subset of sites may subsequently come out of bypass and operate as a cluster before any channels are restored to service.**

Expected Results: All site in the system enter bypass mode.

Setup: **Sites are configured with cluster minimum channels set to 6 and site minimum channels set to 7 (these settings are normally lower; they are set high to simplify testing).**

Execution:

1. At TR site 1 disable channels 9, 10 and 11 using the TX disable switch on the PA (8 channels are still functioning.

   - ☐ Verify system and site still functioning in simulcast.

   - ☐ The Traffic Controller module displays still indicates “TR” not “TC” or “CC”. Note: TC= Working Traffic Channel, standalone mode, TR=Working Channel, simulcast mode, and Control Channel, simulcast mode is indicated by the transmit LED indicator.

2. At TR site 3 disable channels 6, 7 and 8 using the TX disable switch on the PA (5 channels are still functioning).

   - ☐ Verify All sites have entered bypass (the TCs display “TC” and “CC”, not “TR” and every channel status indicates failed at every site.

3. Enable the PAs at the sites using the TX disable switches.

   - ☐ Verify the system recovers to simulcast mode with all transmit sites in normal simulcast mode. The Traffic Controller modules will indicate “TR(n)”, where n is the channel number.

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

20.6 Site ON (trunking) - Enhanced bypass Final Configuration

Purpose: **Confirm sites configured to be in the "ON" condition during BYPASS are in the expected BYPASS mode and can connect to VNIC.**

Expected Results: **The "ON" site traffic controllers have a control channel and calls between terminal radios and dispatch can be made.**

Setup:

Execution:

1. Create a condition to force BYPASS that does not disrupt network connectivity by logging into both GPS receivers and configuring their notifications to set the major alarm threshold to minimum satellites 12 and duration below threshold 5 seconds. This will cause the GPS receivers to set a major alarm after 5 seconds.

2. Configure Notifications from Spectracom GPS Receivers

Navigate to: **Management → Notifications**

2. In the **Events** window pane, click the **GPS** tab.
3. Set the Major Alarm Threshold as follows:
   a. Minimum Satellites: **12**
   b. Duration Below Threshold: **5**
4. Click: **[Submit]**

3. Verify transmit site is in BYPASS mode. The Traffic Controller module display indicates either “TC” or “CC” instead of “TR”.

☐ Observe the stations/repeater Traffic Controller modules. Verify there is an active control channel on one of the Traffic Controller modules. The remaining repeater/stations Traffic Controller modules will indicate “TC”.

☐ Verify the station appearing as control channel is keyed, producing RF power and modulated with control channel data.

☐ Verify a terminal radio set to the system programmed for the site in BYPASS with the correct site ID recognizes the site’s control channel data.

4. Key the terminal radio on a group call.

☐ Verify a working channel assignment is made within the channel group allowed in the personality.

5. Restore the site to simulcast mode by restoring the GPS major alarm notification threshold to minimum satellites = 1 and duration = 345600 for both GPS receivers.

☐ Verify transmit site is in normal simulcast mode. Traffic Controller modules indicate "TR(n).

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

21. VIDA INTER-OPERABILITY GATEWAY TEST

21.1 Local Interoperability

Purpose: **The purpose of this test is to verify correct functionality of the Interoperability Gateway.**

Expected Results: **Verify that the**

Setup: **The Interoperability Gateway connects via 4-wire audio connections in its Universal Access Cards(UAC) cards to interoperability radio units (mobile or desktop). The Gateway also connects to a router and the Network Switching Center (NSC) to provide call functionality across the network.**

Execution:

1. Select Inter-op group 1 on the radio.
2. Initiate a call from the radio to group 1
   - ☐ Verify that audio is heard on inter-op group 1 radio.
3. Initiate a call from the inter-op group 1 radio to group 1
   - ☐ Verify that audio is heard on the radio.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

21.2 NCRN Interoperability

NOTE: This test will be defined during the detailed design phase of the programs execution.

Purpose:	**The purpose of this test is to verify a radio operating on a conventional analog Land Mobile Radio channel will be able to communicate with a radio operating on the P25 radio system.**
Expected Results:	**To Be Determined.**
Setup:	**To Be Determined.**
Execution:	**To Be Determined.**

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

22. INFORMATION ASSURANCE TESTING

22.1 Active Directory

Purpose: **The purpose of this test is to view the GPO structure on an Active Directory server.**

Expected Results: **The GPO structure is valid.**

Setup: **None**

Execution:

1. Log into an Active Directory Server.
2. Open AD Users/Groups
   - ☐ Validate that the computers have been added to AD.
3. Open Group Policies Management
   - ☐ Verify VIDA GPO Structure

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

22.2 Cisco Prime

Purpose: **This test will test the Cisco Prime.**

Expected Results: **This test will verify that the Cisco Prime is communicating with the necessary devices.**

Setup: **The purpose of this test is to verify that Cisco Prime is configured and is capable of accessing the Cisco devices on the network.**

Execution:

1. Use Internet Explorer on a client PC to browse to CiscoPrime
2. Select ‘RME’
3. Expand ‘Devices’
4. Select ‘Inventory’
5. Select ‘View Inventory Connection Status’
6. Select the number on Inventory Collected
7. Select a device
8. Expand ‘All Devices’
9. Select a device
10. Select ‘Cisco View’
11. Select a port
12. Select ‘Configure’
13. Click on a Device
    - View ‘Configuration’
14. Close windows and log out

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

22.3 ePolicy Orchestrator

Purpose: **The purpose of this test is to verify that ePolicy Orchestrator is communicating with its end devices and that it will report actions that have been taken by McAfee Antivirus on a remote computer.**

Expected Results: **ePolicy Orchestrator is accessible and displays valid reporting.**

Setup: **None**

Execution:

1. Use Internet Explorer on a client PC to navigate to the McAfee E-Policy Orchestrator server
2. Log in using proper credentials
3. Go to the Main Screen
   - ☐ Verify all servers have been added to policies.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

22.4 Backup

Purpose: **The purpose of this test is to verify that the Unitrends server has a schedule for performing backups of network computers and that it can display the backup status of those computers**

Expected Results: **The test will verify that the backup is configured.**

Setup: **None**

Execution:

1. Use Internet Explorer on a client PC to navigate to the Unitrends Backup UAC
2. Log in using proper log in credentials
3. Go to the Main Screen
   - ☐ Verify that devices are visible and backups are configured.

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

22.5 Intrusion Detection

Purpose: **The purpose of this test is to verify that the SourceFire Defense Center is communicating with its IDS sensors at remote sites across the network.**

Expected Results: **SouceFire Defense Center is communicating with its IDS sensors.**

Setup: **None**

Execution:

1. Use Internet Explorer on a client PC to navigate to the Sourcefire Defense Center
2. Log in using proper credentials
3. Go to Defense Center Dashboard
4. Click Operations. Go to Sensors
   - ☐ Verify that all Sensors are visible.

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

22.6 SysLog

Purpose: **The purpose of this test is to verify that network devices are sending SysLog messages to the LogLogic server.**

Expected Results: **This test will verify that the clients are reporting to the Log Logic.**

Setup: **None**

Execution:

1. Use Internet Explorer on a client PC to navigate to the LogLogic Syslog web page
2. Log in using proper log in credentials
3. Go to LogLogic System Status Dashboard
4. Click Log Source Status
   - ☐ Verify current devices are reporting.

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

22.7 SUMS

Purpose: **To demonstrate that the SUMS server is communicating with the remote client.**

Expected Results: **This test will verify that the SUMS server is communicating with the remote clients and that the remote clients are updated.**

Setup: **None**

Execution:

1. Log into the SUMS server and launch the ‘IBM Endpoint Manager Console’ and log into the console with the SUMS administers user.

2. Expand ‘Sites’ ‘Custom Sites’ ‘Vida’ and select ‘Subscribed Computers’

   - ☐ Verify that each Computer is listed, in the Subscribed Computers window
   - ☐ Check to make sure that each computer has reported to the SUMS server with in the last 30 minutes by checking the ‘Last Report Time’ column.
   - ☐ To check to make sure all the Subscriber Computers are update by selecting the ‘Baseline’ in the left hand window.
   - ☐ Make sure the ‘Baseline’ window is empty or all computer in the window are gray.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

23. ACTION ITEMS

Test #	Page #	Action/Issue
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
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_____	_____	_____
_____	_____	_____
_____	_____	_____

24. ACRONYMS AND DEFINITIONS

AD	Active Directory
AES	Advanced Encryption Standard
Confirmed Call	A confirmed call is a special type of call where the call is queued until all sites have resources available, or until the confirmed call timer expires (configurable, typically one or two seconds)
DM	Device Manager
DNS	Domain Name Server
FDMA	Frequency Division Multiple Access
FIPS 140-2	Federal Information Processing Standard, publication 140-2. The title is “Security Requirements for Cryptographic Modules”
FM	Frequency Modulation
HA	High Availability
IFW	Internet Firewall
Individual Call	An individual call is a private call between one user and another. It can be between two radios, or between one radio and a dispatch console
IP	Internet Protocol
IPS	Intrusion Prevention System
ISSI	Inter Sub System Interface. This is the interface between WACNs, in the Harris architecture an interface between a VNIC and a foreign P25 system
KEK	Key Encryption Key
KID	16 bit Encryption Key ID
KMF	Key Management Facility
LED	Light Emitting Diode
MASTR V	A Harris base station product

MDIS	Mobile Data Intermediate System, a Harris data switch used in Harris' OpenSky Architecture
MES	Mobile End System, a subscriber radio
MME	Miniature Mobility Exchange, which consists of Harris software running on a SitePro card at the base site. The MME runs the SNDCP layer of the data protocol and is the equivalent of the P25 RFG (RF Gateway)
NSC	Network Switching Center
NSS	Network Switching Server
NWS	Network Sentry
OTAP	Over The Air Programming
OTAR	Over The Air Rekeying
P25	Project 25, a suite of standards for digital radio communications, developed by the Association of Public Safety Communications Officials (APCO) under the TIA TR-8 engineering committee, and published as the TIA-102 set of documents
Priority Talkgroup	The priority talkgroup selected on the subscriber device. Usually this is the talkgroup that the radio will transmit on when the user presses PTT
ProFile	A Harris product used for configuring radios over the P25 radio channel
ProScan	A Harris software algorithm used for radio roaming
PSAP	Public Safety Access Point, usually an agency dispatch center
PSTN	Public Switched Telephone Network
PTT	Push To Talk
RAR	Regional Access Router
RF	Radio Frequency
RFW	Regional Firewall
RMS	Regional Management Server

RNM	Regional Network Manager
RS	Reed Solomon, a form of error detection and correction coding
RSM	Regional Site Manager, a server which runs the RSM, Activity Warehouse and Device Manager applications
SACCH	Slow Associated Control Channel (Phase 2)
SAN	Storage Area Network
Sourcefire DFC	Defense Center
SS	Status Symbol (a two bit field in the control channel, used for channel access control signaling)
SSL	Secure Socket Layers
SSH	Secure Shell is a program to log into another computer over a network, to execute commands in a remote machine, and to move files from one machine to another. It provides strong authentication and secure communications over insecure channels. It is a replacement for rlogin, rsh, rcp, and rdist.
SUMS	Security Update Management Service (a Harris product)
System ID	The System ID is a 12 bit field of the network address which identifies the VNIC
TAC	Technical Assistance Center, a Harris service
TACACS	Terminal Access Controller Access Control System
TDMA	Time Division Multiple Access
TDU	Terminator Data Unit, used to terminate a voice message
TEK	Traffic Encryption Key
Telnet	A terminal emulation program for TCP/IP networks such as the Internet. The Telnet program runs on your computer and connects your PC to a server on the network.
TGID	Talkgroup ID (16 bit, equivalent to GID). The P25 documents usually use GID but some of the older documents use TGID
Traffic Controller	Software entity which resides in a base station at the site and generates the P25 control channel

TRC	Tone Remote Control
TSBK	Trunking Signaling Block (a 196 bit field in the control channel)
Tx	Transmit
UAC	Unified Audio Card
UAS	Unified Administration Server
UID	Unified ID. This is a Harris specific acronym referring to an ID composed of the System ID and SID. The UID is a ten digit number in the form 604-415-4003, representing region, agency, and individual
Unitrends	Enterprise backup for VIDA networks
UPS	Uninterrupted Power Supply
VAS	VIDA Application Server
VCE	VIDA Console Exchange
VCH	Voice Channel (Phase 2)
VDOC	Voice and Data on Control (the control channel can assign itself as a traffic channel)
VIDA	Voice, Interoperability, Data, Access (a Harris system product)
VME	Versa Module Eurocard (IEEE 1014)
VNIC	Voice Network Interface Controller, the Harris voice switch
VTI	VIDA Telephone Interconnect
WACN	Wide Area Communication Network (20 bit network ID, part of SUID). This is a customer network which can include many VNICs
Zeroize	A P25 control channel command which causes the mobile radio to erase its encryption keys (but then requires manual loading to restore encryption keys)

25. UAS DATA BASE

25.1 Subscriber Units

Region Id	Agency Id	P25 IP Address	OpenSky IP Address	Description	Electronic Serial Number	Protocol Mask	Status	Sub Type	Assigned End User	Algorithm Support
10	998		10.128.111.19	OS_Radio_19	0	OpenSky	Enabled Unit			
10	998		10.128.111.20	OS_Radio_20	0	OpenSky	Enabled Unit			
10	998		10.128.111.2	OS_Radio_02	0	OpenSky	Enabled Unit			
10	998		10.128.111.3	OS_Radio_03	0	OpenSky	Enabled Unit			
10	998		10.128.111.4	OS_Radio_04	0	OpenSky	Enabled Unit			
10	998		10.128.111.5	OS_Radio_05	0	OpenSky	Enabled Unit			
10	998		10.128.111.6	OS_Radio_06	0	OpenSky	Enabled Unit			
10	998		10.128.111.7	OS_Radio_07	0	OpenSky	Enabled Unit			
10	998		10.128.111.8	OS_Radio_08	0	OpenSky	Enabled Unit			
10	998		10.128.111.9	OS_Radio_09	0	OpenSky	Enabled Unit			
10	998		10.128.111.10	OS_Radio_10	0	OpenSky	Enabled Unit			
10	998		10.128.111.11	OS_Radio_11	0	OpenSky	Enabled Unit			

10	998		10.128.111.12	OS_Radio_12	0	OpenSky	Enabled Unit			
10	998		10.128.111.13	OS_Radio_13	0	OpenSky	Enabled Unit			
10	998		10.128.111.14	OS_Radio_14	0	OpenSky	Enabled Unit			
10	998		10.128.111.15	OS_Radio_15	0	OpenSky	Enabled Unit			
10	998		10.128.111.16	OS_Radio_16	0	OpenSky	Enabled Unit			
10	998		10.128.111.1	OS_Radio_1	0	OpenSky	Enabled Unit			
10	998		10.128.111.17	OS_Radio_17	0	OpenSky	Enabled Unit			
10	998		10.128.111.18	OS_Radio_18	0	OpenSky	Enabled Unit			
10	998	10.128.79.9		Radio9	109980009	P25	Enabled Unit	Harris XG-75 Portable	010:998:0009	AES
10	998	10.128.79.10		Radio10	109980010	P25	Enabled Unit	Harris XG-75 Portable	010:998:0010	AES
10	998	10.128.79.8		Radio8	109980008	P25	Enabled Unit	Harris XG-75 Portable	010:998:0008	AES
10	998	10.128.53.1		Console9101	109989101	P25	Enabled Unit	Maestro Console	010:998:9101	AES
10	998	10.128.53.2		Console 9102	109989102	P25	Enabled Unit	Maestro Console	010:998:9102	Both
10	998	10.128.79.1		Radio1	109980001	P25	Enabled Unit	Harris P5400	010:998:0001	AES
10	998	10.128.79.2		Radio2	109980002	P25	Enabled Unit	Harris P5400	010:998:0002	AES
10	998	10.128.79.3		Radio3	109980003	P25	Enabled Unit	Harris XG-75 Portable	010:998:0003	AES
10	998	10.128.79.4		Radio4	109980004	P25	Enabled Unit	Harris XG-75 Portable	010:998:0004	AES

10	998	10.128.79.5	Radio5	109980005	P25	Enabled Unit	Harris XG-75 Portable	010:998:0005	AES
10	998	10.128.79.6	Radio6	109980006	P25	Enabled Unit	Harris XG-75 Portable	010:998:0006	AES
10	998	10.128.79.7	Radio7	109980007	P25	Enabled Unit	Harris XG-75 Portable	010:998:0007	AES
10	998	10.128.79.11	Radio11	109980011	P25	Enabled Unit	Harris UNITY XG-100P	010:998:0011	AES
10	998	10.128.79.12	Radio12	109980012	P25	Enabled Unit	Harris UNITY XG-100P	010:998:0012	AES
10	998	10.128.1.161	s0u1xcda	0	P25	Enabled Unit		010:998:9001	AES
10	998	10.128.1.162	s0u1xcdb	0	P25	Enabled Unit		010:998:9005	AES

25.2 Voice End Users

Region Id	Agency Id	User Id	Name	Description	Personality	User Privilege	Message Trunked ICall	Enable P25 AES OTAR	Manually-Keyed	Preferred Vocoder	Transcoding Allowed Flag
10	998	010:998:9921	VAQ-SS22	SiteSim VAQ User22	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0210	BeOn_210	BeOn_210	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9012	XCD_9012	XCD_9012	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9014	XCD_9014	XCD_9014	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:7005	VTI_7005	VTI_7005	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9909	VAQ-SS10	SiteSim VAQ User10	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9926	VAQ-SS27	SiteSim VAQ User27	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9905	VAQ-SS06	SiteSim VAQ User06	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0202	BeOn_202	BeOn_202	BeOn_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9925	VAQ-SS26	SiteSim VAQ User26	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0015	U9980015	U9980015	OS_Pers	998_10_default	TRUE	FALSE	FALSE	OpenSky 2400 AMBE+2	TRUE

10	998	010:998:00 16	U9980016	U9980016	OS_Pers	998_10_default	TRUE	FALSE	FALSE	OpenSky 2400 AMBE+2	TRUE
10	998	010:998:99 15	VAQ-SS16	SiteSim VAQ User16	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:99 03	VAQ-SS04	SiteSim VAQ User04	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:99 18	VAQ-SS19	SiteSim VAQ User19	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:99 04	VAQ-SS05	SiteSim VAQ User05	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:99 20	VAQ-SS21	SiteSim VAQ User21	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:99 07	VAQ-SS08	SiteSim VAQ User08	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:00 03	U9980003	U9980003	Pers1	998_10_default	TRUE	TRUE	FALSE	P25 Full Rate	TRUE
10	998	010:998:99 19	VAQ-SS20	SiteSim VAQ User20	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:99 11	VAQ-SS12	SiteSim VAQ User12	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:00 17	U9980017	U9980017	OS_Pers	998_10_default	TRUE	FALSE	FALSE	OpenSky 2400 AMBE+2	TRUE
10	998	010:998:00 08	U9980008	U9980008	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:99 01	VAQ-SS02	SiteSim VAQ User02	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE

10	998	010:998:02 08	BeOn_208	BeOn_208	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:99 27	VAQ-SS28	SiteSim VAQ User28	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:70 09	VTI_7009	VTI_7009	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:90 04	XCD_9004	XCD_9004	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:90 06	XCD_9006	XCD_9006	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:90 07	XCD_9007	XCD_9007	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:00 05	U9980005	U9980005	Pers1	998_10_default	TRUE	TRUE	FALSE	P25 Full Rate	TRUE
10	998	010:998:90 02	XCD_9002	XCD_9002	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:70 02	VTI_7002	VTI_7002	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:99 06	VAQ-SS07	SiteSim VAQ User07	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:99 22	VAQ-SS23	SiteSim VAQ User23	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:70 01	VTI_7001	VTI_7001	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:02 07	BeOn_207	BeOn_207	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE

10	998	010:998:9010	XCD_9010	XCD_9010	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9929	VAQ-SS30	SiteSim VAQ User30	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:7004	VTI_7004	VTI_7004	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9018	XCD_9018	XCD_9018	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0013	U9980013	U9980013	OS_Pers	998_10_default	TRUE	FALSE	FALSE	OpenSky 2400 AMBE+2	TRUE
10	998	010:998:7006	VTI_7006	VTI_7006	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9016	XCD_9016	XCD_9016	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9009	XCD_9009	XCD_9009	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:6005	Site5VirtualUser	Site5VirtualUser	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0006	U9980006	U9980006	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9011	XCD_9011	XCD_9011	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9013	XCD_9013	XCD_9013	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0007	U9980007	U9980007	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE

10	998	010:998:0206	BeOn_206	BeOn_206	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9019	XCD_9019	XCD_9019	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9917	VAQ-SS18	SiteSim VAQ User18	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9908	VAQ-SS09	SiteSim VAQ User09	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0004	U9980004	U9980004	Pers1	998_10_default	TRUE	TRUE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9005	XCD_9005	XCD_9005	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9900	VAQ-SS01	SiteSim VAQ User01	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9003	XCD_9003	XCD_9003	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9928	VAQ-SS29	SiteSim VAQ User29	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9923	VAQ-SS24	SiteSim VAQ User24	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0011	U9980011	U9980011	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0010	U9980010	U9980010	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9916	VAQ-SS17	SiteSim VAQ User17	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE

10	998	010:998:9008	XCD_9008	XCD_9008	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9017	XCD_9017	XCD_9017	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0205	BeOn_205	BeOn_205	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0201	BeOn_201	BeOn_201	BeOn_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9001	XCD_9001	XCD_9001	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0209	BeOn_209	BeOn_209	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0204	BeOn_204	BeOn_204	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9914	VAQ-SS15	SiteSim VAQ User15	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9103	U9980003	U9980003	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:7007	VTI_7007	VTI_7007	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:7010	VTI_7010	VTI_7010	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0009	U9980009	U9980009	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9924	VAQ-SS25	SiteSim VAQ User25	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE

10	998	010:998:7008	VTI_7008	VTI_7008	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0002	U9980002	U9980002	Pers1	998_10_default	TRUE	TRUE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0012	U9980012	U9980012	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0014	U9980014	U9980014	OS_Pers	998_10_default	TRUE	FALSE	FALSE	OpenSky 2400 AMBE+2	TRUE
10	998	010:998:9912	VAQ-SS13	SiteSim VAQ User13	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:6003	Site3VirtualUser	Site3VirtualUser	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9902	VAQ-SS03	SiteSim VAQ User03	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0203	BeOn_203	BeOn_203	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9015	XCD_9015	XCD_9015	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9913	VAQ-SS14	SiteSim VAQ User14	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:7003	VTI_7003	VTI_7003	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9910	VAQ-SS11	SiteSim VAQ User11	OS_Pers	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:6004	Site4VirtualUser	Site4VirtualUser	Pers1	998_10_default	TRUE	FALSE	FALSE	P25 Full Rate	TRUE

10	998	010:998:9101	Cons9101	Console 9101	Pers1	998_10_supervisor	TRUE	FALSE	FALSE	P25 Full Rate	TRUE
10	998	010:998:0001	U9980001	U9980001	Pers1	998_10_supervisor	TRUE	TRUE	FALSE	P25 Full Rate	TRUE
10	998	010:998:9102	Cons9102	Console 9102	Pers1	998_10_supervisor	TRUE	FALSE	FALSE	P25 Full Rate	TRUE

25.3 Talk Groups

TG Id	Region Id	Agency Id	Name	Description	SPNI	Property Id	Priority Id	Coverage	Valid Coverage	Announcement Group	Test Partition Only	Type	Preferred Vocoder	ISSI Site	Transcoding Allowed
9900	10	998	PS-28-AN	VAQ SitSim01	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	Analog/ADPCM		TRUE
9901	10	998	Tone-25	VAQ SitSim02	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
9902	10	998	AmpFreq	VAQ SitSim03	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
9903	10	998	PseudSp	VAQ SitSim04	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
9904	10	998	Phrases	VAQ SitSim05	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
9905	10	998	SiteSm1	VAQ SitSim06	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
9906	10	998	SiteSm2	VAQ SitSim07	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
9907	10	998	SiteSm3	VAQ SitSim08	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE

9908	10	998	SiteSm 4	VAQ SitSim09	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:Al lSites:AllP SAPs	None	FALSE	Genera l	P25 Full Rate		TRUE
9909	10	998	SiteSm 5	VAQ SitSim10	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:Al lSites:AllP SAPs	None	FALSE	Genera l	P25 Full Rate		TRUE
9910	10	998	SiteSm 6	VAQ SitSim11	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:Al lSites:AllP SAPs	None	FALSE	Genera l	P25 Full Rate		TRUE
9911	10	998	T-25-HR	VAQ SitSim12	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:Al lSites:AllP SAPs	None	FALSE	Genera l	P25 Half Rate		TRUE
9912	10	998	AF-HR	VAQ SitSim13	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:Al lSites:AllP SAPs	None	FALSE	Genera l	P25 Half Rate		TRUE
9913	10	998	PSp-HR	VAQ SitSim14	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:Al lSites:AllP SAPs	None	FALSE	Genera l	P25 Half Rate		TRUE
9914	10	998	Phrs-HR	VAQ SitSim15	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:Al lSites:AllP SAPs	None	FALSE	Genera l	P25 Half Rate		TRUE
9915	10	998	T-25-AN	VAQ SitSim16	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:Al lSites:AllP SAPs	None	FALSE	Genera l	Analog/ADP CM		TRUE
9916	10	998	AF-AN	VAQ SitSim17	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:Al lSites:AllP SAPs	None	FALSE	Genera l	Analog/ADP CM		TRUE
9917	10	998	P-Sp-AN	VAQ SitSim18	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:Al lSites:AllP SAPs	None	FALSE	Genera l	Analog/ADP CM		TRUE

9918	10	998	Phrs-AN	VAQ SitSim19	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	Analog/ADPCM		TRUE
9919	10	998	VAQ20	VAQ SitSim20	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
9920	10	998	DVSITV	VAQ SitSim21	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Half Rate		TRUE
9921	10	998	T-25OS	VAQ SitSim22	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE		TRUE
9922	10	998	AF-OS	VAQ SitSim23	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE		TRUE
9923	10	998	P-SpOS	VAQ SitSim24	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE		TRUE
9924	10	998	PhrsOS	VAQ SitSim25	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE		TRUE
9925	10	998	T-25OS2	VAQ SitSim26	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE+2		TRUE
9926	10	998	AF-OS2	VAQ SitSim27	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE		TRUE
9927	10	998	P-SpOS2	VAQ SitSim28	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE+2		TRUE

9928	10	998	PhrsOS 2	VAQ SitSim29	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE+2		TRUE
9929	10	998	VAQ30	VAQ SitSim30	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
64000	10	998	64000 ALL	TG64000 P25 Full Rate All Call	1	3	7	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	All-Call	P25 Full Rate		FALSE
64001	10	998	64001 TUL	TG64001 TG64001 P25 Full Rate TX Unconf Low Priority	1	3	3	P25Sites_PSAPs	P25Sites_PSAPs	64007:64007ANN	FALSE	General	P25 Full Rate	010:Region 10--111:ISSI_SITE	TRUE
64002	10	998	64002 TUM	TG64002 P25 Full Rate TX Unconf Med Priority	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	64007:64007ANN	FALSE	General	P25 Full Rate	010:Region 10--111:ISSI_SITE	TRUE
64003	10	998	64003 TUM	TG64003 P25 Full Rate TX Unconf Med Priority	1	5	5	P25Sites_PSAPs	P25Sites_PSAPs	64007:64007ANN	FALSE	General	P25 Full Rate	010:Region 10--111:ISSI_SITE	TRUE
64004	10	998	64004 TUM	TG64004 P25 Full Rate TX Unconf Med Priority	1	4	5	P25Sites_PSAPs	P25Sites_PSAPs	64007:64007ANN	FALSE	General	P25 Full Rate	010:Region 10--111:ISSI_SITE	TRUE

64005	10	998	64005 TUM	TG64005 P25 Full Rate Msg Unconf Med Priority	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	64007:64007ANN	FALSE	General	P25 Full Rate	010:Region 10--111:ISSI_SITE	TRUE
64006	10	998	64006 TUH	TG64006 P25 Full Rate Msg Unconf High Priority	1	3	6	P25Sites_PSAPs	P25Sites_PSAPs	64007:64007ANN	FALSE	General	P25 Full Rate		TRUE
64007	10	998	64007 ANN	TG64007 P25 Full Rate Announcement	1	3	6	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	Announcement	P25 Full Rate		TRUE
64051	10	998	64051 TUL	TG64051 P25 Half Rate Low Priority	1	3	3	P25Sites_PSAPs	P25Sites_PSAPs	64057:64057ANN	FALSE	General	P25 Half Rate		TRUE
64052	10	998	64052 TUM	TG64052 P25 Half Rate Med Priority	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	64057:64057ANN	FALSE	General	P25 Half Rate		TRUE
64053	10	998	64053 TUM	TG64053 P25 Half Rate Med Priority	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	64057:64057ANN	FALSE	General	P25 Half Rate		TRUE
64054	10	998	64054 TUM	TG64054 P25 Half Rate Med Priority	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	64057:64057ANN	FALSE	General	P25 Half Rate		TRUE

64055	10	998	64055 TUM	TG64055 P25 Half Rate Med Priority	1	3	5	P25Sites _PSAPs	P25Sites_ PSAPs	64057:64057A NN	FALSE	Genera l	P25 Half Rate		TRUE
64056	10	998	64056 TUH	TG64056 P25 Half Rate High Priority	1	3	6	P25Sites _PSAPs	P25Sites_ PSAPs	64057:64057A NN	FALSE	Genera l	P25 Half Rate		TRUE
64057	10	998	64057 ANN	TG64057 P25 Half Rate Announcem ent	1	3	6	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	Annou nceme nt	P25 Half Rate		FALSE
64100	10	998	64100 ALL	TG64100 P25 Full Rate All Call	1	3	7	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	All-Call	P25 Full Rate		FALSE
64101	10	998	64101 TCL	TG64101 P25 Full Rate Conf Low Priority	1	4	3	P25Sites _PSAPs	P25Sites_ PSAPs	64107:64107A NN	FALSE	Genera l	P25 Full Rate		TRUE
64102	10	998	64102 TCM	TG64102 P25 Full Rate Conf Med Priority	1	4	5	P25Sites _PSAPs	P25Sites_ PSAPs	64107:64107A NN	FALSE	Genera l	P25 Full Rate		TRUE
64103	10	998	64103 TCM	TG64103 P25 Full Rate Conf Med Priority	1	4	5	P25Sites _PSAPs	P25Sites_ PSAPs	64107:64107A NN	FALSE	Genera l	P25 Full Rate		TRUE
64104	10	998	64104 TCM	TG64104 P25 Full Rate Conf Med Priority	1	4	5	P25Sites _PSAPs	P25Sites_ PSAPs	64107:64107A NN	FALSE	Genera l	P25 Full Rate		TRUE

64105	10	998	64105 TCM	TG64105 P25 Full Rate Conf Med Priority	1	4	5	P25Sites _PSAPs	P25Sites_ PSAPs	64107:64107ANN	FALSE	General	P25 Full Rate		TRUE
64106	10	998	64106 TCH	TG64106 P25 Full Rate Conf High Priority	1	4	6	P25Sites _PSAPs	P25Sites_ PSAPs	64107:64107ANN	FALSE	General	P25 Full Rate		TRUE
64107	10	998	64107 ANN	TG64107 P25 Full Rate Announcement	1	4	6	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	Announcement	P25 Full Rate		TRUE
64151	10	998	64151 TCL	TG64151 P25 Half Rate Low Priority	1	4	3	P25Sites _PSAPs	P25Sites_ PSAPs	64157:64157ANN	FALSE	General	P25 Half Rate		TRUE
64152	10	998	64152 TCM	TG64152 P25 Half Rate Med Priority	1	4	5	P25Sites _PSAPs	P25Sites_ PSAPs	64157:64157ANN	FALSE	General	P25 Half Rate		TRUE
64153	10	998	64153 TCM	TG64153 P25 Half Rate Med Priority	1	4	5	P25Sites _PSAPs	P25Sites_ PSAPs	64157:64157ANN	FALSE	General	P25 Half Rate		TRUE
64154	10	998	64154 TCM	TG64154 P25 Half Rate Med Priority	1	4	5	P25Sites _PSAPs	P25Sites_ PSAPs	64157:64157ANN	FALSE	General	P25 Half Rate		TRUE
64155	10	998	64155 TCM	TG64155 P25 Half Rate Med Priority	1	4	5	P25Sites _PSAPs	P25Sites_ PSAPs	64157:64157ANN	FALSE	General	P25 Half Rate		TRUE

64156	10	998	64156 TCH	TG64156 P25 Half Rate High Priority	1	4	6	P25Sites _PSAPs	P25Sites_ PSAPs	64157:64157ANN	FALSE	General	P25 Half Rate		TRUE
64157	10	998	64157 ANN	TG64157 P25 Half Rate Announcement	1	4	6	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	Announcement	P25 Half Rate		FALSE
64201	10	998	64201 TUE	TG64201 P25 Full Rate Unconf Encrypted	1	3	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	P25 Full Rate		TRUE
64202	10	998	64202 TUE	TG64202 P25 Full Rate Unconf Encrypted	1	3	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	P25 Full Rate		TRUE
64203	10	998	64203 TCE	TG64203 P25 Full Rate Conf Encrypted	1	4	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	P25 Full Rate		TRUE
64204	10	998	64204 TCE	TG64204 P25 Full Rate Conf Encrypted	1	4	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	P25 Full Rate		TRUE
64251	10	998	64251 TUE	TG64251 P25 Half Rate Unconf Encrypted	1	3	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	P25 Half Rate		TRUE
64252	10	998	64252 TUE	TG64252 P25 Half Rate Unconf Encrypted	1	3	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	P25 Half Rate		TRUE

64253	10	998	64253 TCE	TG64253 P25 Half Rate Conf Encrypted	1	4	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	P25 Half Rate		TRUE
64254	10	998	64254 TCE	TG64254 P25 Half Rate Conf Encrypted	1	4	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	P25 Half Rate		TRUE
64301	10	998	64301 MUM	TG64301 P25 Full Rate MT Unconf Med Priority	1	5	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	P25 Full Rate		TRUE
64302	10	998	64302 MUM	TG64302 P25 Full Rate MT Unconf Med Priority	1	5	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	P25 Full Rate		TRUE
64303	10	998	64303 MUM	TG64303 P25 Full Rate MT Unconf Med Priority	1	5	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	P25 Full Rate		TRUE
64304	10	998	64304 MUM	TG64304 P25 Full Rate MT Unconf Med Priority	1	5	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	P25 Full Rate		TRUE
64305	10	998	64305 MCM	TG64305 P25 Full Rate MT Conf Med Priority	1	6	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	P25 Full Rate		TRUE

64306	10	998	64306 MCM	TG64306 P25 Full Rate MT Conf Med Priority	1	6	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	Genera l	P25 Full Rate		TRUE
64307	10	998	64307 MCM	TG64307 P25 Full Rate MT Conf Med Priority	1	6	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	Genera l	P25 Full Rate		TRUE
64308	10	998	64308 MCM	TG64308 P25 Full Rate MT Conf Med Priority	1	6	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	Genera l	P25 Full Rate		TRUE
64351	10	998	64351 MUM	TG64351 P25 Half Rate MT Unconf Med Priority	1	5	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	Genera l	P25 Half Rate		TRUE
64352	10	998	64352 MUM	TG64352 P25 Half Rate MT Unconf Med Priority	1	5	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	Genera l	P25 Half Rate		TRUE
64353	10	998	64353 MUM	TG64353 P25 Half Rate MT Unconf Med Priority	1	5	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	Genera l	P25 Half Rate		TRUE
64354	10	998	64354 MUM	TG64354 P25 Half Rate MT	1	5	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	Genera l	P25 Half Rate		TRUE

				Unconf Med Priority											
64355	10	998	64355 MCM	TG64355 P25 Half Rate MT Conf Med Priority	1	6	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	P25 Half Rate		TRUE
64356	10	998	64356 MCM	TG64356 P25 Half Rate MT Conf Med Priority	1	6	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	P25 Half Rate		TRUE
64357	10	998	64357 MCM	TG64357 P25 Half Rate MT Conf Med Priority	1	6	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	P25 Half Rate		TRUE
64358	10	998	64358 MCM	TG64358 P25 Half Rate MT Conf Med Priority	1	6	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	P25 Half Rate		TRUE
64400	10	998	64400 OSTUH	TG64400 OS AMBE TX Unconf High Priority	1	3	6	AllRegs:AllSites:AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE+2		TRUE
64401	10	998	64401 OSTUM	TG64401 OS AMBE TX Unconf Med Priority	1	3	5	AllRegs:AllSites:AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE+2		TRUE
64402	10	998	64402 OSTUM	TG64402 OS AMBE TX	1	3	5	AllRegs:AllSites:AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE+2		TRUE

				Unconf Med Priority											
64403	10	998	64403 OSTUM	TG64403 OS AMBE MT Unconf Med Priority	1	5	5	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE+2		TRUE
64404	10	998	64404 OSTUL	TG64404 OS AMBE TX Unconf Low Priority	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE+2		TRUE
64450	10	998	64450 ANA	TG64450 Analog ADPCM Med Priority	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	IP Console Intercom	Analog/ADPCM		TRUE
64451	10	998	64451 ANA	TG64451 Analog ADPCM Med Priority	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	Analog/ADPCM		TRUE
64452	10	998	64452 ANA	TG64452 Analog ADPCM Med Priority	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	Analog/ADPCM		TRUE
64453	10	998	64453 ANA	TG64453 Analog ADPCM Med Priority	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	General	Analog/ADPCM		TRUE
9900	10	998	PS-28-AN	VAQ SitSim01	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	Analog/ADPCM		TRUE

9901	10	998	Tone-25	VAQ SitSim02	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
9902	10	998	AmpFreq	VAQ SitSim03	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
9903	10	998	PseudSp	VAQ SitSim04	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
9904	10	998	Phrases	VAQ SitSim05	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
9905	10	998	SiteSm1	VAQ SitSim06	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
9906	10	998	SiteSm2	VAQ SitSim07	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
9907	10	998	SiteSm3	VAQ SitSim08	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
9908	10	998	SiteSm4	VAQ SitSim09	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
9909	10	998	SiteSm5	VAQ SitSim10	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
9910	10	998	SiteSm6	VAQ SitSim11	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE

9911	10	998	T-25-HR	VAQ SitSim12	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Half Rate		TRUE
9912	10	998	AF-HR	VAQ SitSim13	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Half Rate		TRUE
9913	10	998	PSp-HR	VAQ SitSim14	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Half Rate		TRUE
9914	10	998	Phrs-HR	VAQ SitSim15	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Half Rate		TRUE
9915	10	998	T-25-AN	VAQ SitSim16	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	Analog/ADPCM		TRUE
9916	10	998	AF-AN	VAQ SitSim17	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	Analog/ADPCM		TRUE
9917	10	998	P-Sp-AN	VAQ SitSim18	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	Analog/ADPCM		TRUE
9918	10	998	Phrs-AN	VAQ SitSim19	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	Analog/ADPCM		TRUE
9919	10	998	VAQ20	VAQ SitSim20	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
9920	10	998	DVSITV	VAQ SitSim21	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Half Rate		TRUE

9921	10	998	T-25OS	VAQ SitSim22	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE		TRUE
9922	10	998	AF-OS	VAQ SitSim23	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE		TRUE
9923	10	998	P-SpOS	VAQ SitSim24	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE		TRUE
9924	10	998	PhrsOS	VAQ SitSim25	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE		TRUE
9925	10	998	T-25OS2	VAQ SitSim26	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE+2		TRUE
9926	10	998	AF-OS2	VAQ SitSim27	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE		TRUE
9927	10	998	P-SpOS2	VAQ SitSim28	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE+2		TRUE
9928	10	998	PhrsOS 2	VAQ SitSim29	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE+2		TRUE
9929	10	998	VAQ30	VAQ SitSim30	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	P25 Full Rate		TRUE
64000	10	998	64000 ALL	TG64000 P25 Full Rate All Call	1	3	7	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	All-Call	P25 Full Rate		FALSE

64001	10	998	64001 TUL	TG64001 TG64001 P25 Full Rate TX Unconf Low Priority	1	3	3	P25Sites _PSAPs	P25Sites_ PSAPs	64007:64007ANN	FALSE	General	P25 Full Rate	010:Region 10--111:ISSI_SITE	TRUE
64002	10	998	64002 TUM	TG64002 P25 Full Rate TX Unconf Med Priority	1	3	5	P25Sites _PSAPs	P25Sites_ PSAPs	64007:64007ANN	FALSE	General	P25 Full Rate	010:Region 10--111:ISSI_SITE	TRUE
64003	10	998	64003 TUM	TG64003 P25 Full Rate TX Unconf Med Priority	1	5	5	P25Sites _PSAPs	P25Sites_ PSAPs	64007:64007ANN	FALSE	General	P25 Full Rate	010:Region 10--111:ISSI_SITE	TRUE
64004	10	998	64004 TUM	TG64004 P25 Full Rate TX Unconf Med Priority	1	4	5	P25Sites _PSAPs	P25Sites_ PSAPs	64007:64007ANN	FALSE	General	P25 Full Rate	010:Region 10--111:ISSI_SITE	TRUE
64005	10	998	64005 TUM	TG64005 P25 Full Rate Msg Unconf Med Priority	1	3	5	P25Sites _PSAPs	P25Sites_ PSAPs	64007:64007ANN	FALSE	General	P25 Full Rate	010:Region 10--111:ISSI_SITE	TRUE
64006	10	998	64006 TUH	TG64006 P25 Full Rate Msg Unconf High Priority	1	3	6	P25Sites _PSAPs	P25Sites_ PSAPs	64007:64007ANN	FALSE	General	P25 Full Rate		TRUE

64007	10	998	64007 ANN	TG64007 P25 Full Rate Announcement	1	3	6	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	Announcement	P25 Full Rate		TRUE
64051	10	998	64051 TUL	TG64051 P25 Half Rate Low Priority	1	3	3	P25Sites_PSAPs	P25Sites_PSAPs	64057:64057ANN	FALSE	General	P25 Half Rate		TRUE
64052	10	998	64052 TUM	TG64052 P25 Half Rate Med Priority	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	64057:64057ANN	FALSE	General	P25 Half Rate		TRUE
64053	10	998	64053 TUM	TG64053 P25 Half Rate Med Priority	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	64057:64057ANN	FALSE	General	P25 Half Rate		TRUE
64054	10	998	64054 TUM	TG64054 P25 Half Rate Med Priority	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	64057:64057ANN	FALSE	General	P25 Half Rate		TRUE
64055	10	998	64055 TUM	TG64055 P25 Half Rate Med Priority	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs	64057:64057ANN	FALSE	General	P25 Half Rate		TRUE
64056	10	998	64056 TUH	TG64056 P25 Half Rate High Priority	1	3	6	P25Sites_PSAPs	P25Sites_PSAPs	64057:64057ANN	FALSE	General	P25 Half Rate		TRUE
64057	10	998	64057 ANN	TG64057 P25 Half Rate	1	3	6	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	Announcement	P25 Half Rate		FALSE

				Announcement											
64100	10	998	64100 ALL	TG64100 P25 Full Rate All Call	1	3	7	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	All-Call	P25 Full Rate		FALSE
64101	10	998	64101 TCL	TG64101 P25 Full Rate Conf Low Priority	1	4	3	P25Sites_PSAPs	P25Sites_PSAPs	64107:64107ANN	FALSE	General	P25 Full Rate		TRUE
64102	10	998	64102 TCM	TG64102 P25 Full Rate Conf Med Priority	1	4	5	P25Sites_PSAPs	P25Sites_PSAPs	64107:64107ANN	FALSE	General	P25 Full Rate		TRUE
64103	10	998	64103 TCM	TG64103 P25 Full Rate Conf Med Priority	1	4	5	P25Sites_PSAPs	P25Sites_PSAPs	64107:64107ANN	FALSE	General	P25 Full Rate		TRUE
64104	10	998	64104 TCM	TG64104 P25 Full Rate Conf Med Priority	1	4	5	P25Sites_PSAPs	P25Sites_PSAPs	64107:64107ANN	FALSE	General	P25 Full Rate		TRUE
64105	10	998	64105 TCM	TG64105 P25 Full Rate Conf Med Priority	1	4	5	P25Sites_PSAPs	P25Sites_PSAPs	64107:64107ANN	FALSE	General	P25 Full Rate		TRUE
64106	10	998	64106 TCH	TG64106 P25 Full Rate Conf High Priority	1	4	6	P25Sites_PSAPs	P25Sites_PSAPs	64107:64107ANN	FALSE	General	P25 Full Rate		TRUE
64107	10	998	64107 ANN	TG64107 P25 Full Rate	1	4	6	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	Announcement	P25 Full Rate		TRUE

				Announcement											
64151	10	998	64151 TCL	TG64151 P25 Half Rate Low Priority	1	4	3	P25Sites_PSAPs	P25Sites_PSAPs	64157:64157ANN	FALSE	General	P25 Half Rate		TRUE
64152	10	998	64152 TCM	TG64152 P25 Half Rate Med Priority	1	4	5	P25Sites_PSAPs	P25Sites_PSAPs	64157:64157ANN	FALSE	General	P25 Half Rate		TRUE
64153	10	998	64153 TCM	TG64153 P25 Half Rate Med Priority	1	4	5	P25Sites_PSAPs	P25Sites_PSAPs	64157:64157ANN	FALSE	General	P25 Half Rate		TRUE
64154	10	998	64154 TCM	TG64154 P25 Half Rate Med Priority	1	4	5	P25Sites_PSAPs	P25Sites_PSAPs	64157:64157ANN	FALSE	General	P25 Half Rate		TRUE
64155	10	998	64155 TCM	TG64155 P25 Half Rate Med Priority	1	4	5	P25Sites_PSAPs	P25Sites_PSAPs	64157:64157ANN	FALSE	General	P25 Half Rate		TRUE
64156	10	998	64156 TCH	TG64156 P25 Half Rate High Priority	1	4	6	P25Sites_PSAPs	P25Sites_PSAPs	64157:64157ANN	FALSE	General	P25 Half Rate		TRUE
64157	10	998	64157 ANN	TG64157 P25 Half Rate Announcement	1	4	6	P25Sites_PSAPs	P25Sites_PSAPs	None	FALSE	Announcement	P25 Half Rate		FALSE

64201	10	998	64201 TUE	TG64201 P25 Full Rate Unconf Encrypted	1	3	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	P25 Full Rate		TRUE
64202	10	998	64202 TUE	TG64202 P25 Full Rate Unconf Encrypted	1	3	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	P25 Full Rate		TRUE
64203	10	998	64203 TCE	TG64203 P25 Full Rate Conf Encrypted	1	4	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	P25 Full Rate		TRUE
64204	10	998	64204 TCE	TG64204 P25 Full Rate Conf Encrypted	1	4	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	P25 Full Rate		TRUE
64251	10	998	64251 TUE	TG64251 P25 Half Rate Unconf Encrypted	1	3	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	P25 Half Rate		TRUE
64252	10	998	64252 TUE	TG64252 P25 Half Rate Unconf Encrypted	1	3	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	P25 Half Rate		TRUE
64253	10	998	64253 TCE	TG64253 P25 Half Rate Conf Encrypted	1	4	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	P25 Half Rate		TRUE
64254	10	998	64254 TCE	TG64254 P25 Half Rate Conf Encrypted	1	4	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	P25 Half Rate		TRUE

64301	10	998	64301 MUM	TG64301 P25 Full Rate MT Unconf Med Priority	1	5	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	Genera l	P25 Full Rate		TRUE
64302	10	998	64302 MUM	TG64302 P25 Full Rate MT Unconf Med Priority	1	5	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	Genera l	P25 Full Rate		TRUE
64303	10	998	64303 MUM	TG64303 P25 Full Rate MT Unconf Med Priority	1	5	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	Genera l	P25 Full Rate		TRUE
64304	10	998	64304 MUM	TG64304 P25 Full Rate MT Unconf Med Priority	1	5	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	Genera l	P25 Full Rate		TRUE
64305	10	998	64305 MCM	TG64305 P25 Full Rate MT Conf Med Priority	1	6	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	Genera l	P25 Full Rate		TRUE
64306	10	998	64306 MCM	TG64306 P25 Full Rate MT Conf Med Priority	1	6	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	Genera l	P25 Full Rate		TRUE
64307	10	998	64307 MCM	TG64307 P25 Full Rate MT	1	6	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	Genera l	P25 Full Rate		TRUE

				Conf Med Priority											
64308	10	998	64308 MCM	TG64308 P25 Full Rate MT Conf Med Priority	1	6	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	P25 Full Rate		TRUE
64351	10	998	64351 MUM	TG64351 P25 Half Rate MT Unconf Med Priority	1	5	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	P25 Half Rate		TRUE
64352	10	998	64352 MUM	TG64352 P25 Half Rate MT Unconf Med Priority	1	5	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	P25 Half Rate		TRUE
64353	10	998	64353 MUM	TG64353 P25 Half Rate MT Unconf Med Priority	1	5	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	P25 Half Rate		TRUE
64354	10	998	64354 MUM	TG64354 P25 Half Rate MT Unconf Med Priority	1	5	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	P25 Half Rate		TRUE
64355	10	998	64355 MCM	TG64355 P25 Half Rate MT Conf Med Priority	1	6	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	P25 Half Rate		TRUE

64356	10	998	64356 MCM	TG64356 P25 Half Rate MT Conf Med Priority	1	6	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	Genera l	P25 Half Rate		TRUE
64357	10	998	64357 MCM	TG64357 P25 Half Rate MT Conf Med Priority	1	6	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	Genera l	P25 Half Rate		TRUE
64358	10	998	64358 MCM	TG64358 P25 Half Rate MT Conf Med Priority	1	6	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	Genera l	P25 Half Rate		TRUE
64400	10	998	64400 OSTUH	TG64400 OS AMBE TX Unconf High Priority	1	3	6	AllRegs: AllSites: AllPSAPs	AllRegs:Al lSites:AllP SAPs	None	FALSE	Genera l	OpenSky 2400 AMBE+2		TRUE
64401	10	998	64401 OSTU M	TG64401 OS AMBE TX Unconf Med Priority	1	3	5	AllRegs: AllSites: AllPSAPs	AllRegs:Al lSites:AllP SAPs	None	FALSE	Genera l	OpenSky 2400 AMBE+2		TRUE
64402	10	998	64402 OSTU M	TG64402 OS AMBE TX Unconf Med Priority	1	3	5	AllRegs: AllSites: AllPSAPs	AllRegs:Al lSites:AllP SAPs	None	FALSE	Genera l	OpenSky 2400 AMBE+2		TRUE
64403	10	998	64403 OSTU M	TG64403 OS AMBE MT Unconf Med Priority	1	5	5	AllRegs: AllSites: AllPSAPs	AllRegs:Al lSites:AllP SAPs	None	FALSE	Genera l	OpenSky 2400 AMBE+2		TRUE

64404	10	998	64404 OSTUL	TG64404 OS AMBE TX Unconf Low Priority	1	3	3	AllRegs: AllSites: AllPSAPs	AllRegs:AllSites:AllPSAPs	None	FALSE	General	OpenSky 2400 AMBE+2		TRUE
64450	10	998	64450 ANA	TG64450 Analog ADPCM Med Priority	1	3	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	IP Console Intercom	Analog/ADPCM		TRUE
64451	10	998	64451 ANA	TG64451 Analog ADPCM Med Priority	1	3	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	Analog/ADPCM		TRUE
64452	10	998	64452 ANA	TG64452 Analog ADPCM Med Priority	1	3	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	Analog/ADPCM		TRUE
64453	10	998	64453 ANA	TG64453 Analog ADPCM Med Priority	1	3	5	P25Sites _PSAPs	P25Sites_ PSAPs	None	FALSE	General	Analog/ADPCM		TRUE

25.4 PSAPs

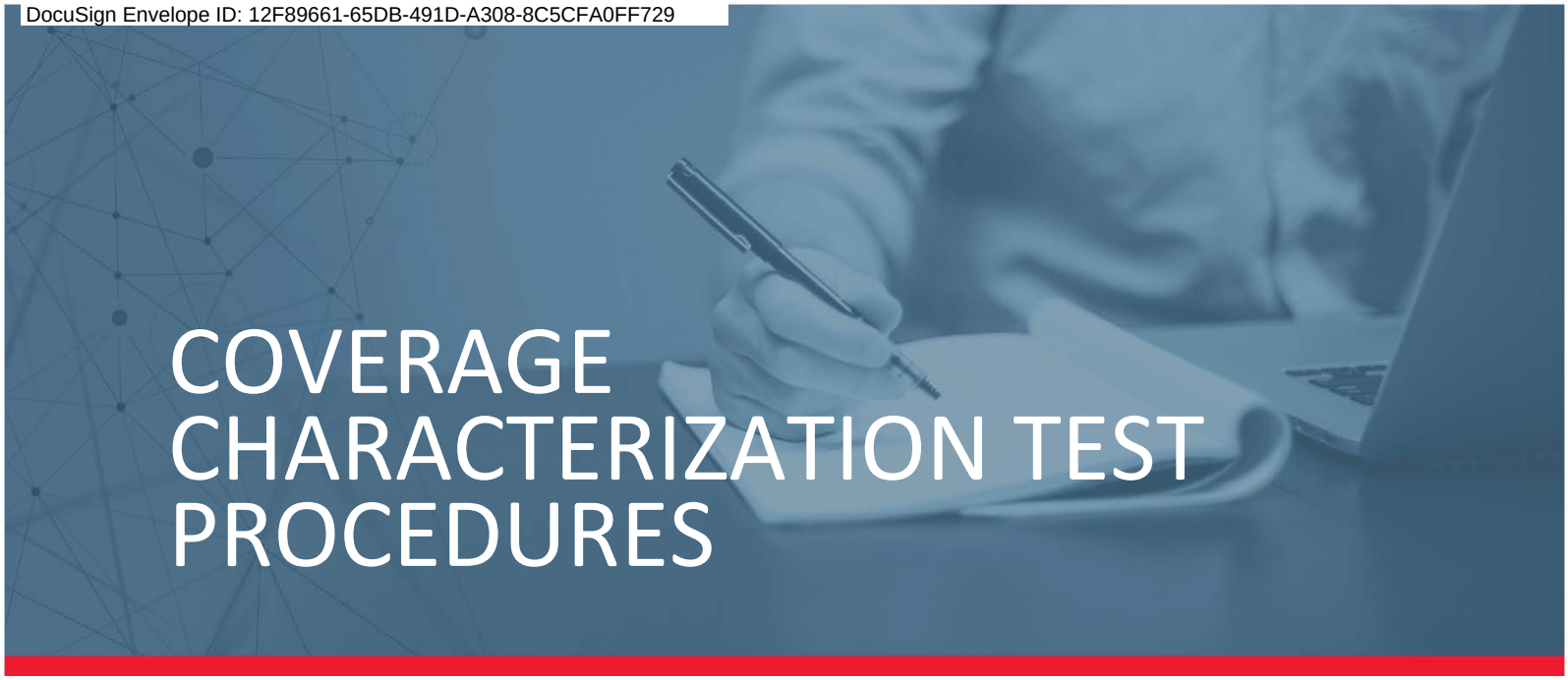
Region Id	Agency Id	PSAP Id	Device Id	Name	Description	Max Talk Paths	Service Type
10	998	9101	1	Console9101	Console9101	7	IP Console
10	998	9102	1	Console9102	Console9102	7	IP Console
10	998	7001	1	VTI7001	VTI7001	16	VTI
10	998	7002	1	VTI7002	VTI7002	16	VTI
10	998	9103	1	Console9103	Console9103	7	IP Console
10	998	9104	1	Console9104	Console9104	7	IP Console
10	998	9105	1	Console9105	Console9105	7	IP Console
10	998	9106	1	Console9106	Console9106	7	IP Console
10	998	9107	1	Console9107	Console9107	7	IP Console
10	998	9108	1	Console9108	Console9108	7	IP Console
10	998	9109	1	Console9109	Console9109	7	IP Console
10	998	9110	1	Console9110	Console9110	7	IP Console

Region Id	Agency Id	P25 IP Address	OpenSky IP Address	Description	Electronic Serial Number	Protocol Mask	Status	Sub Type	Assigned End User	Algorithm Support
10	998		10.128.111.19	OS_Radio_19	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.20	OS_Radio_20	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.2	OS_Radio_02	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.3	OS_Radio_03	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.4	OS_Radio_04	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.5	OS_Radio_05	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.6	OS_Radio_06	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.7	OS_Radio_07	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.8	OS_Radio_08	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.9	OS_Radio_09	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.10	OS_Radio_10	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.11	OS_Radio_11	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.12	OS_Radio_12	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.13	OS_Radio_13	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.14	OS_Radio_14	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.15	OS_Radio_15	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.16	OS_Radio_16	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.1	OS_Radio_1	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.17	OS_Radio_17	0000000000000000	OpenSky	Enabled Unit			
10	998		10.128.111.18	OS_Radio_18	0000000000000000	OpenSky	Enabled Unit			
10	998	10.128.79.9		Radio9	0000000109980009	P25	Enabled Unit	Harris XG-75 Portable	010:998:0009	AES
10	998	10.128.79.10		Radio10	0000000109980010	P25	Enabled Unit	Harris XG-75 Portable	010:998:0010	AES
10	998	10.128.79.8		Radio8	0000000109980008	P25	Enabled Unit	Harris XG-75 Portable	010:998:0008	AES
10	998	10.128.53.1		Console9101	0000000109989101	P25	Enabled Unit	Maestro Console	010:998:9101	AES
10	998	10.128.53.2		Console 9102	0000000109989102	P25	Enabled Unit	Maestro Console	010:998:9102	Both
10	998	10.128.79.1		Radio1	0000000109980001	P25	Enabled Unit	Harris P5400	010:998:0001	AES

10	998	10.128.79.2	Radio2	0000000109980002	P25	Enabled Unit	Harris P5400	010:998:0002	AES
10	998	10.128.79.3	Radio3	0000000109980003	P25	Enabled Unit	Harris XG-75 Portable	010:998:0003	AES
10	998	10.128.79.4	Radio4	0000000109980004	P25	Enabled Unit	Harris XG-75 Portable	010:998:0004	AES
10	998	10.128.79.5	Radio5	0000000109980005	P25	Enabled Unit	Harris XG-75 Portable	010:998:0005	AES
10	998	10.128.79.6	Radio6	0000000109980006	P25	Enabled Unit	Harris XG-75 Portable	010:998:0006	AES
10	998	10.128.79.7	Radio7	0000000109980007	P25	Enabled Unit	Harris XG-75 Portable	010:998:0007	AES
10	998	10.128.79.11	Radio11	0000000109980011	P25	Enabled Unit	Harris UNITY XG-100P	010:998:0011	AES
10	998	10.128.79.12	Radio12	0000000109980012	P25	Enabled Unit	Harris UNITY XG-100P	010:998:0012	AES
10	998	10.128.1.161	s0u1xcda	0000000000000000	P25	Enabled Unit		010:998:9001	AES
10	998	10.128.1.162	s0u1xcdb	0000000000000000	P25	Enabled Unit		010:998:9005	AES

26. Action Items

Test #	Page #	Action/Issue	Date Resolved	Resolution



COVERAGE CHARACTERIZATION TEST PROCEDURES

Table of Contents

ABOUT THIS DOCUMENT

This document was specifically prepared for the customer shown below. Each section of this document is individually maintained in the Harris document control system. The revisions of each section are individually listed.

Customer:	Nevada Shared Radio System (NSRS) - NDOT
Prepared By:	Jerome Daniszewski
Total Test Pages:	**24**

DOCUMENT USAGE

Although specific tests are not included relating to electrical measurements or timing parameters of equipment, Harris measures and records these tests and levels as part of our standard installation practices. These parameters include but are not limited to:

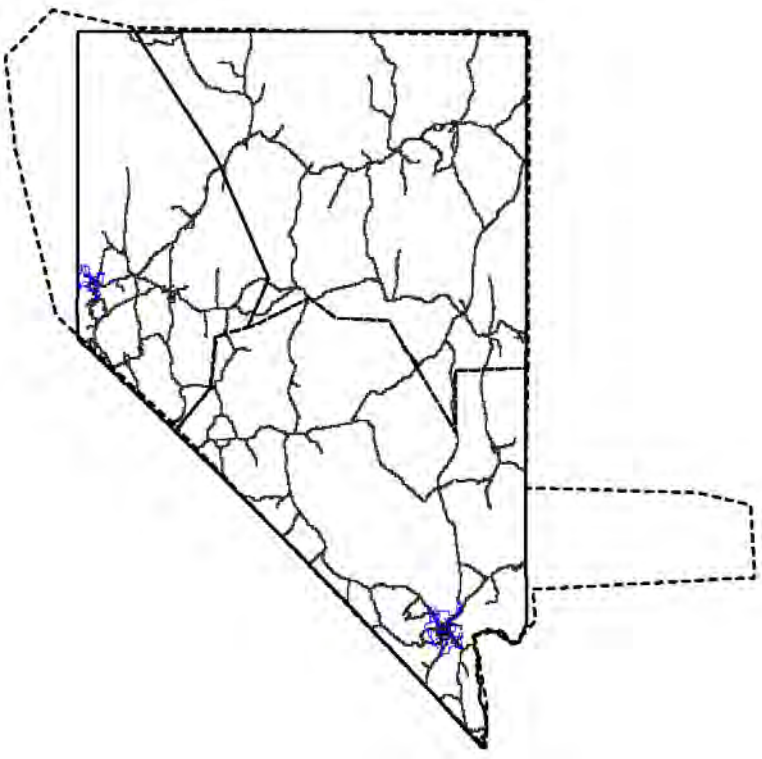
- Transmit Frequency and Deviation
- Output and Reflected Power
- Receiver Sensitivity
- Receiver Multicoupler Gain (if applicable)
- Receiver Preamplifier Gain (if applicable)
- Time Domain Reflectometry of Transmission Line
- Combiner Loss (if applicable)
- Audio line out
- Audio line in

We will provide system parameters and measurements to the NSRS Members as part of the final documentation package.

1. SERVICE AREA DEFINITIONS AND GRID STRUCTURE

TSB-88-D defines a service area as a boundary of the geographic area of concern for a user, and states that Validated CPC Service Area Reliability shall be determined by the percentage of test locations in the bounded service area that meet or exceed the specified CPC. We are proposing a Bounded Area design for NSRS as defined in TSB-88-D wherein coverage predictions are made out to the boundary of the defined service area and coverage is verified throughout the service area out to the boundary through the performance of a Validated CPC Service Area Reliability test. The service area is shown in Figure 1 and consists of the Nevada State Border and the state highways as defined by Attachment 4 of the NSRS Project RFP, the entirety of the three regions planned for the buildoout, and the Urban Areas as defined by NSRS.

Figure 1 – Nevada Shared Radio System Service Areas



TSB-88-D recommends coverage verification measurements at a statistically significant number of random test locations, uniformly distributed throughout the service area. We divide the service area by a test grid pattern using TSB-88-D Estimate of Proportions analysis to determine the number and size of the test tiles providing both statistically significant

measurement results and a high confidence that the results are a true indication of the installed radio system coverage.

Table 1 provides our recommended tile sizes to obtain a uniform distribution of tiles throughout the customer defined service areas.

Table 1 - Coverage Service Area, Tile Size, and Tile Count

Service Area Definition	Tile Size (miles)	Accessible Tile Count
NSRS Boundary, consisting of	1 x 1 mile	~ 80,900
Region 1		~ 30,000
Region 2		~ 19,650
Region 3		~ 31,250
State Highways	1 x 1 mile	~ 5600
10% of tiles within cities	¼ X ¼ mile	~ 1000*0.1 = 100

The grid pattern overlays onto street maps and we determine a drive test route that will pass through all accessible tiles (i.e. have roads) within the defined service area boundaries, with an approximately equal distance traveled in each tile. Accessible tiles are based on access to the tile from a road included in the US Census Bureau TIGER roads database. In order to include as many test tiles as possible, the following roads have been deemed accessible:

- Primary Roads
- Secondary Roads
- Local Roads (Streets)
- Ramps
- Service Drives
- Vehicular Trails
- Private Service Roads

The drive route should pass through each tile at least once but not more than twice, as far as is practically possible. The defined drive route should not pass through tunnels, underpasses, underground garages, or other man made obstructive areas where radio coverage is not

planned or expected. If a drive route passes through any of these areas, we disable the TYPHON test unit to prevent collection of data in these areas.

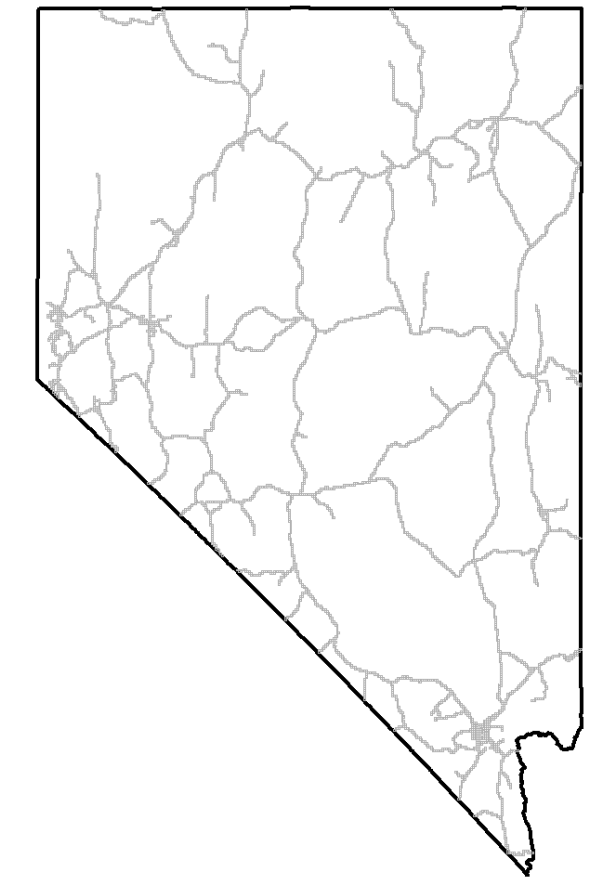
Measurements will be made in all accessible tiles within the defined service area boundaries. We do not use test measurements along the drive route that are outside of each service area boundary. Any areas or accessible tiles within the service area boundary that NSRS decides not to test will have coverage scored as a PASS in the reliability calculations.

We will discard inaccessible tiles (i.e. have no roads) from the reliability calculations with the acceptance criteria adjusted by treating the inaccessible tiles as exclusion zones.
The statewide accessible grid structure is shown in **Figure 2 - Nevada Accessible Grid Structure**. **Figure 2** also includes the 3 regional boundaries used to plan the build-out and test of the system.

Figure 2 - NSRS Accessible Grid Structure

The State highway grid structure is shown in Figure 3 – State Highway Grid Structure.

Figure 3 – State Highway Grid Structure



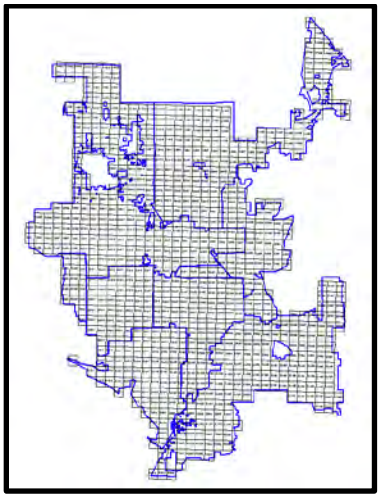
The following are the urban areas as defined in Section 1.4.1, Paragraph F:

- Las Vegas Metropolitan Area
- Reno/Sparks City Limits
- Elko City Limits

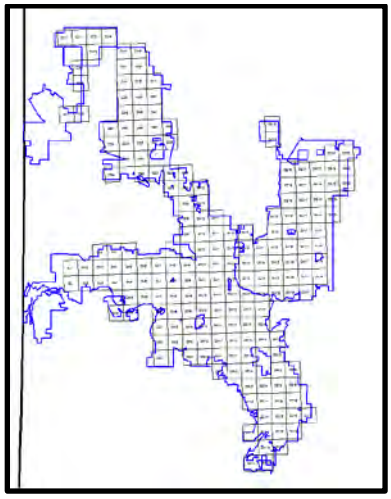
The Urban Areas grid structure is shown in Figure 4 – Urban Areas Grid Structure.

Figure 4 – Urban Areas Grid Structure**s**

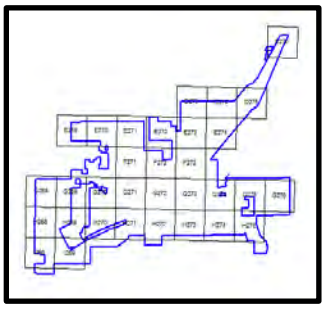
Las Vegas Metropolitan Area



Reno/Sparks City Limits



Elko City Limits



Ten percent of the urban area tiles will be characterized for DAQ Voice Quality per the RFP. Measurements will be made in all accessible grids within NSRS's defined service area boundaries. Test measurements along the drive route that are outside of NSRS's defined service area boundaries will not be counted. Any areas or accessible grids within the service area boundary that the NSRS Members decide not to test will have coverage scored as a PASS in the reliability calculations.

Harris Corporation reserves the right to update the maps and coverage guarantees after system implementation, through the change order process, in the event that radio sites or design parameters changed during the system build-out.

Inaccessible grid (i.e. have no roads) will be discarded from the reliability calculations with the % acceptance criteria adjusted by treating the inaccessible grids as exclusion zones.

2. TALK-OUT BIT ERROR RATE (BER) TEST

This Acceptance Test Procedure (ATP) is used by Harris for RF coverage verification based on Bit Error Rate (BER) measurements. This procedure provides an accurate, statistically valid, repeatable, objective, and cost-effective method to verify all the Members' coverage requirements are met.

This ATP is in conformance with the Telecommunications Industry Association (TIA) Telecommunications Systems Bulletin TSB-88.3-D titled "Wireless Communications Systems - Performance in Noise and Interference-Limited Situations - Recommended Methods for Technology-Independent Modeling, Simulation, and Verification". TSB-88-D has defined Channel Performance Criterion (CPC) as the specified minimum design performance level in a faded channel, and provides a set of Delivered Audio Quality (DAQ) CPCs that define subjective voice quality performance applicable to both analog voice and digital voice systems.
TSB-88-D also defines a service area as a boundary of the geographic area of concern for a user, and states that Validated CPC Service Area Reliability shall be determined by the percentage of test locations in the bounded service area that meet or exceed the specified CPC. Harris has proposed a Bounded Area design for the Nevada Shared Radio System as defined in TSB-88-D wherein coverage predictions are made out to the boundary of the defined service area and coverage is verified throughout the service area out to the boundary through the performance of a Validated CPC Service Area Reliability test.

RF coverage using this ATP is verified by measuring talk-out (base to portable) BER throughout NSRS's defined bounded service areas, and calculating the percentage of measurements that are equal or better than a BER of 2.4% required to support NSRS's specified CPC of DAQ 3.4.

2.1 Setup

Harris' TYPHON wireless testing system is utilized to measure BER. TYPHON consists of Harris portable radios, a GPS receiver to provide accurate position information for each measured data point, a computer with an internal clock that coordinates and records the test data, roof mounted antennas, and variable attenuators for use when portable coverage is being tested.

The TYPHON equipment will be mounted inside the test vehicle (an SUV/van for multiple BER measurements) with an external antenna(s) mounted on the outside and centrally located on the vehicle's roof, with no other equipment installed on the roof. For portable outdoor coverage verification, the variable attenuator will be set to the appropriate level to account for portable body losses. Attenuator values are shown in Table 2.

Table 2 - Coverage Service Area, Body/Building Loss, and Attenuator Values

Service Area Definition	Description	Body Loss (dB)	Attenuator Value (dB)*
All Service Areas	Portable Outdoor	7 dB	7

* The actual attenuator value, including Body Loss, will be determined prior to testing once the actual test vehicle and test set up configurations are finalized

Prior to taking BER measurements, each site must be audited to verify that the radio system is operating properly. The audits will verify the antenna configuration, the power into the antenna, the antenna installation, and the frequency of the test transmitter. Harris shall provide all test equipment necessary to perform the audits.

2.2 Data Measurements

For each of the three regions, each radio system base station site defined as part of that region continuously transmits a P25 test pattern data sequence on a working channel, and measurements of this signal are collected every 3 seconds by the TYPHON equipment mounted inside the test vehicle as it is driven along the defined test drive route. The software in the TYPHON laptop computer will automatically measure and record the test data and determine the BER for each 3-second measurement data record along the test drive route.

2.3 Data Analysis and Acceptance

As defined by Section 5 of TSB88-3, latest revision, we post-process all mean measurement data records collected from the drive test within the defined service area boundary, with data records recorded every 0.1-mile (typically) used in the final analysis.

Measurements that have a BER equal to or less than 2.4% are recorded as PASS; the remainder are recorded as FAIL. This acceptance criteria is for P25 Phase 2 operation. P25 Phase 1 operation will meet or exceed the system's Phase 2 coverage.

Harris will then calculate the ratio of PASS points to total number of points collected for the P25 system. The installed radio system coverage is deemed to meet the coverage requirements if, for each of the three regional bounded service areas in Table 3, the ratio of the number of PASS points to the total number of points in the service area equals or exceeds the minimum % Validated CPC Service Area Reliability acceptance criteria that is shown. If all three of the regions pass, the the NSRS Boundary passes.

Table 3 - Coverage Service Area, Service, and Acceptance Criteria

Service Area Definition	Description	% Validated CPC Service Area Reliability Acceptance Criteria
NSRS boundary, consisting of	Portable Outdoor	**69.5%**
Region 1	Portable Outdoor	**65.0%**
Region 2	Portable Outdoor	**67.5%**
Region 3	Portable Outdoor	**66.5%**
Nevada State Highways as customer defined	Portable Outdoor	90.1%

2.4 Results Presentation

The data records are plotted on a map showing the test grids, the areas tested and the test results. Different pen colors are used to show ranges of measured BER. A test report is also provided that summarizes the test results.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

3. TALK-IN BIT ERROR RATE (BER) TEST

This Coverage Acceptance Test Procedure (CATP) is used by Harris for RF coverage verification based on signal strength measurements. This procedure provides an accurate, statistically valid, repeatable, objective, and cost-effective method to verify that all of the NSRS coverage requirements are met.

This CATP is in conformance with the Telecommunications Industry Association (TIA) Telecommunications Systems Bulletin TSB-88.3-D titled “Wireless Communications Systems - Performance in Noise and Interference-Limited Situations - Recommended Methods for Technology-Independent Modeling, Simulation, and Verification”. TSB-88-D has defined Channel Performance Criterion (CPC) as the specified minimum design performance level in a faded channel, and provides a set of Delivered Audio Quality (DAQ) CPCs that define subjective voice quality performance applicable to both analog voice and digital voice systems.

TSB-88.3-D also defines a service area as a boundary of the geographic area of concern for a user, and states that Validated CPC Service Area Reliability shall be determined by the percentage of test locations in the bounded service area that meet or exceed the specified CPC. Harris has proposed a Bounded Area design for the Nevada Shared Radio System as defined in TSB-88.3-D wherein coverage predictions are made out to the boundary of the defined service area and coverage is verified throughout the service area out to the boundary through the performance of a Validated CPC Service Area Reliability test.

RF coverage using this CATP is verified by measuring talk-in (portable to base) BER at all sites from a test unit located throughout NSRS’ defined bounded service area, and calculating the percentage of measurements that equal or exceed a specified BER from a portable radio required to support NSRS’ specified CPC of DAQ 3.4.

3.1 Setup

Harris’ TYPHON wireless testing system is utilized to measure BER. TYPHON connects to a base station at each site in the system and includes a GPS receiver to provide accurate time information for each measured data point and a computer with an internal clock that coordinates and records the test data.

Multiple TYPHON units are required. One TYPHON unit is mounted inside the test vehicle (standard passenger vehicle) with an external antenna mounted on the vehicle's roof. A portable radio is also installed in the test vehicle with its external antenna also mounted on the vehicle's roof. No other equipment is installed on the roof of the test vehicle. One TYPHON unit will be located adjacent to the base station receiver at each site. TYPHON will be connected to the BASE station of the channel under test. For portable outdoor coverage verification, the variable attenuator will be set to the appropriate level to account for portable body losses. Variable attenuator values are shown in Table 2 in Section 2.1.

Prior to taking BER measurements, each site must be audited to verify that the radio system is operating properly. The audits will verify the antenna configuration, the antenna installation, and the frequency of the test transmitter. Harris shall provide all test equipment necessary to perform the site audits.

Table 4 - Coverage Service Area, Body/Building Loss, and Attenuator Values

Service Area Definition	Description	Body Loss (dB)	Attenuator Value (dB)*
All Service Areas	Portable Outdoor	7 dB	7

* The actual Attenuator value, including Body Loss, will be determined prior to testing once the actual test vehicle and test set up configurations are finalized.

3.2 Data Measurements

With the test vehicle in motion[1] along the drive route, the portable in the test vehicle transmits the data sequences on a working channel, and measurements of this signal are collected with the TYPHON equipment at each site. The software in the TYPHON laptop computer will automatically measure and record the data sequences that will be used to determine the BER for each measurement point along the drive route.

[1] Vehicle velocity must be between 30-60 miles per hour dependent on the grid size to provide the maximum number of test sequences along the drive route and ensure a minimum of one test sequence per grid area.

The GPS time of the start and stop (ON and OFF) for each transmission, as well as the vehicle position for each transmission, will be recorded in the test vehicle TYPHON.log file. These start and stop times will identify the corresponding portions of the base station receive TYPHON.log file containing the valid data to be used in the analysis.

3.3 Data Analysis and Acceptance

As defined by Section 5 of TSB88-3, latest revision, we post-process all mean measurement data records collected from the drive test within the defined service area boundary, with data records recorded every 0.1-mile (typically) used in the final analysis.

Measurements that have a BER equal to or better than 2.6% are recorded as PASS; the remainder are recorded as FAIL. This acceptance criteria is for P25 Phase 2 operation. P25 Phase 1 operation will meet or exceed the system's Phase 2 coverage.

Harris will then calculate the ratio of PASS points to total number of points collected for the P25 system. The installed radio system coverage is deemed to meet the coverage requirements if, for each bounded service area in Table 5, the ratio of the number of PASS points to the total number of points in the service area equals or exceeds the minimum % Validated CPC Service Area Reliability acceptance criteria that is shown. If all three of the regions pass, the the NSRS Boundary passes.

Table 5 - Coverage Service Area, Service, and Acceptance Criteria

Service Area Definition	Description	% Validated CPC Service Area Reliability Acceptance Criteria
NSRS boundary, consisting of	**Portable Outdoor**	**69.5%**
Region 1	**Portable Outdoor**	**65.0%**
Region 2	**Portable Outdoor**	**67.5%**
Region 3	**Portable Outdoor**	**66.5%**
Nevada State Highways as customer defined	**Portable Outdoor**	**90.0%**

3.4 Results Presentation

The data records are plotted on a map showing the test grids, the areas tested and the test results. Different pen colors are used to show ranges of measured mean signal levels. A test report is also provided that summarizes the test results.

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

4. VOICE QUALITY SAMPLE TEST, PORTABLE

This Characterization Test Procedure (CTP) is used by Harris for verification of portable coverage based on the evaluation of Digital voice quality.

This CTP is in conformance the Telecommunications Industry Association (TIA) Telecommunications Systems Bulletin TSB-88.3-D, titled “Wireless Communications Systems - Performance in Noise and Interference-Limited Situations - Recommended Methods for Technology-Independent Modeling, Simulation, and Verification”. TSB-88-D has defined Channel Performance Criterion (CPC) as the specified minimum design performance level in a faded channel, and provides a set of Delivered Audio Quality (DAQ) CPCs that define subjective voice quality performance applicable to both analog voice and digital voice systems. These DAQ definitions are provided in Table 6.

Table 6 - Delivered Audio Quality Scale Definitions

Delivered Audio Quality	Subjective Performance Description
DAQ 5.0	Speech easily understood.
DAQ 4.5	Speech easily understood. Infrequent Noise/Distortion.
DAQ 4.0	Speech easily understood. Occasional Noise/Distortion.
DAQ 3.4	Speech understandable with repetition only rarely required. Some Noise/Distortion.
DAQ 3.0	Speech understandable with slight effort. Occasional repetition required due to Noise/Distortion.
DAQ 2.0	Understandable with considerable effort. Frequent repetition due to Noise/Distortion.
DAQ 1.0	Unusable, speech present but unreadable.

TSB-88-D also defines a service area as a boundary of the geographic area of concern for a user, and states that Validated CPC Service Area Reliability shall be determined by the percentage of test locations in the bounded service area that meet or exceed the specified CPC. Harris has proposed a Bounded Area design for the NSRS as defined in TSB-88-D wherein coverage predictions are made out to the boundary of the defined service area and coverage is

verified throughout the service area out to the boundary through the performance of a Validated CPC Service Area Reliability test.

Portable coverage using this CATP is characterized by evaluating the voice quality of Digital voice test calls to/from a portable radio at test locations in a random sample of 10% of NSRS' defined urban service area. At each test location, a test call is placed from the portable user to the dispatcher (an inbound call), as well as from the dispatcher to the portable user (an outbound call). The inbound and outbound test call at each location is graded using the DAQ definitions in Table 6.

4.1 Test Equipment and Preparation

Portable radios as proposed and from NSRS' original order will be used for the voice quality test.

Prior to performing the tests, each site must be audited to verify that the radio system is operating properly. The audits will verify the antenna configuration, the power into the antenna, the antenna installation, and the frequency of the test transmitter. Harris shall provide all test equipment necessary to perform the site audits.

4.2 Characterizing of Test Locations

The Digital voice quality test requires two representatives from each entity (Harris and NSRS). One representative from Harris and one from NSRS will be the Field team, which will travel the drive route, perform the inbound calls, and grade the outbound calls. The second representatives from Harris and NSRS will be the Base team, which will remain at the dispatch location, grade the inbound calls, and perform the outbound calls.

To reduce the time required for this coverage test, a single Base team can support multiple Field teams, and multiple Field and Base teams may be used.

The Digital voice test calls within each grid consist of a short message representative of typical public safety call duration and include the identification of the location being tested. The suggested inbound test message is "TESTING GRID NUMBER XXX", followed by a short sentence or two from a newspaper or periodical such as "USA Today". To ensure that the message is understood, the dispatcher then repeats the inbound test message. The dispatcher will then make a similar outbound test call. The suggested outbound test message is

"CONFIRMING GRID XXX", followed by a different short sentence or two from a newspaper or periodical such as "USA Today". The field team will then repeat the dispatcher's test message. Within each grid, if the message is not understood on the first attempt, it can be repeated one time. Dependent on the size of the test grid and the vehicle speed, the test vehicle can be driven through the test grid a second time and the voice quality test call repeated.

Each of the four representatives grades the test call using the Table 6 DAQ definitions and records the test score for each test location using the template in Table 7. PASS or FAIL determination is made separately for the inbound and outbound calls at each location. For each call direction, a test location is deemed to PASS if it meets or exceeds NSRS' requirement for DAQ 3.4 voice quality from both graders. If both graders agree that the voice quality does not meet the defined DAQ 3.4 criteria, then that test location fails for the direction being graded. If a score differs between testers at a location that results in a failing score from only one tester, that location will need to be tested again to determine the cause of the discrepancy. If the discrepancy cannot be rectified, then that grid will be set aside for discussion and evaluation.

4.3 Test Analysis and Acceptance

The data logged by the four representatives on the grading template is then analyzed to determine whether the individual test grid meets the DAQ 3.4 definition.

4.4 Results Presentation

A test report is provided that includes:

- The number of test grids
- The location tested within each grid
- A copy of the Table 7 inbound or outbound grading template used by each grader

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

Table 7 –Portable Coverage

Voice Quality Test Grading Template

Coverage Test Data for: Nevada Shared Radio System Date: _____

Requirement: DAQ 3.4

Building Loss Attenuator Value: N/A dB

Portable Attenuator Value: ____ dB

Check the link used: ☐ Digital Voice ☐ Base to Portable (outbound)

☐ Portable to Base (inbound)

Harris Evaluator:	NSRS Evaluator:
Organization:	Organization:
Test Radio:	Test Frequency:

Service Area Test Grid Number	Harris Grade	NSRS Grade	Remarks

(One row for each test grid/location)

5. *PORTABLE INDOOR VOICE QUALITY TEST*

This Acceptance Test Procedure (ATP) verifies portable indoor coverage in mandatory buildings based on the evaluation of Digital voice quality.

This ATP is in conformance the Telecommunications Industry Association (TIA) Telecommunications Systems Bulletin TSB-88-D, titled "Wireless Communications Systems - Performance in Noise and Interference-Limited Situations - Recommended Methods for Technology-Independent Modeling, Simulation, and Verification". TSB-88-D has defined Channel Performance Criterion (CPC) as the specified minimum design performance level in a faded channel, and provides a set of Delivered Audio Quality (DAQ) CPCs that define subjective voice quality performance applicable to both analog voice and digital voice systems. These DAQ definitions are provided in Table 11.

Table 8 - Delivered Audio Quality Scale Definitions

Delivered Audio Quality	Subjective Performance Description
DAQ 5.0	Speech easily understood.
DAQ 4.5	Speech easily understood. Infrequent Noise/Distortion.
DAQ 4.0	Speech easily understood. Occasional Noise/Distortion.
DAQ 3.4	Speech understandable with repetition only rarely required. Some Noise/Distortion.
DAQ 3.0	Speech understandable with slight effort. Occasional repetition required due to Noise/Distortion.
DAQ 2.0	Understandable with considerable effort. Frequent repetition due to Noise/Distortion.
DAQ 1.0	Unusable, speech present but unreadable.

TSB-88-D also defines a service area as a boundary of the geographic area of concern for a user, and states that Validated CPC Service Area Reliability shall be determined by the percentage of test locations in the bounded service area that meet or exceed the specified CPC.

RF coverage using this ATP is verified by evaluating the voice quality of digital voice test calls to/from a portable radio in each of the mandatory buildings (bounded service areas) specified by NSRS. In each building, test calls are placed from the portable user to the dispatcher (an inbound call), as well as from the dispatcher to the portable user (an outbound call). The inbound and outbound test calls in each building are graded using the DAQ definitions in Table 11. Scores that equal or exceed NSRS's specified CPC of DAQ 3.4 are considered acceptable (PASS), and those lower than DAQ 3.4 are not acceptable (FAIL).

5.1 Test Equipment and Preparation

Portable radios as proposed and from NSRS's original order will be used for the voice quality test. Prior to performing the tests, Harris will bench test and align all portable radios to be used during coverage testing. The portable radio will be worn on the belt and equipped with a shoulder-mounted speaker/microphone.

Prior to performing the tests, each site must be audited to verify that the radio system is operating properly. The audits will verify the antenna configuration, the power into the antenna, the antenna installation, and the frequency of the test transmitter. Harris shall provide all test equipment necessary to perform the site audits.

5.2 Test Planning

TSB-88.3-D recommends coverage verification at a statistically significant number of random test locations, uniformly distributed throughout the service area. To accomplish this, each mandatory building (bounded service area) is divided into a grid pattern as an aid to test planning.

An equal number of points on each floor, excluding basements, of each mandatory building will be tested. Each floor will be divided into 20-ft by 20-ft grids to obtain a uniform distribution of 100-200 grids in each mandatory building. A minimum of 20 test grids is required for small, single floor mandatory buildings. The voice quality test is conducted using portable radios near the center of each building test grid.

Test grids will exclude elevators. Harris and NSRS will mutually agree and identify other areas of each mandatory building that will be excluded from testing such as locations where RF signals are not permitted due to potential interference with sensitive electronics equipment, and areas where access is denied. Test grids that are within excluded areas of a building will not be tested and will be disregarded in the data analysis.

5.3 Grading of Building Test Locations

The digital voice quality test requires two representatives from each entity (Harris and NSRS). One representative from Harris and one from NSRS will be the Field team, which will travel the drive route, perform the inbound calls, and grade the outbound calls. The second representatives from Harris and NSRS will be the Base team, which will remain at the dispatch location, grade the inbound calls, and perform the outbound calls.

To reduce the time required for this coverage test, a single Base team can support multiple Field teams, and multiple Field and Base teams may be used.

At each agreed upon test location within a building, the portable user to dispatcher (inbound) and the dispatcher to portable user (outbound) test calls are performed. Per TSB-88-D, if the message is not understood on the first attempt the portable user is allowed to move 3-feet in any direction and the test can be repeated one time. The voice quality test is then repeated at each test grid within the building.

The digital voice test calls at each location within a building consist of a short message representative of typical public safety call duration and include the identification of the building and location being tested. The suggested inbound test message is “Mobile Team to Dispatcher, Testing Grid Number XXX”, followed by [Random Test Language], Grid Number XXX, how do you copy Grid Number XXX?” The dispatcher will then make a similar outbound test call. The suggested outbound test message is ““Dispatcher to Mobile Team, Testing Grid Number XXX”, followed by [repeated Random Test Language], Grid Number XXX, how do you copy Grid Number XXX?” Within each grid, if the message is not understood on the first attempt, it can be repeated one time. If a repeat (2nd PTT) test call performed within the grid is scored as a PASS, it will be annotated on the Table 13 grading template as a PASS-RETRY. If

the second attempt to communicate fails (no access or audio quality below the required DAQ level), that test grid will be remain scored as a FAIL.

The [Random Test Language] to be used shall be mutually agreed upon between NSRS and Harris prior to testing. NSRS shall provide a list of potential test messages representing commonly used dispatch language, void of acronyms, and not to exceed 10 seconds in length, for evaluation. From the potential list of messages, one hundred shall be selected as the pseudo-random messages to be used for testing purposes. The phrase to be used during each test will be determined by the speaker. The final list will be determined prior to testing.

Each of the four representatives grades each test call using the DAQ definitions and records the test score for each test location using the template. PASS or FAIL determination is made separately for the inbound and outbound calls at each location. For each call direction, a test location is deemed to PASS if it meets or exceeds NSRS's requirement for DAQ 3.4 voice quality from both graders. If both graders agree that the voice quality does not meet the defined DAQ 3.4 criteria, then that test location fails for the direction being graded. If a score differs between testers at a location that results in a failing score from only one tester, that location will need to be tested again to determine the cause of the discrepancy. If the discrepancy cannot be rectified, then that grid will be set aside for discussion and evaluation.

NSRS reserves the right to begin testing anywhere within the building, i.e. the four corners (N, S, E, W) and the center of the building. NSRS also reserves the right to decide not to test all planned test grid locations within a building as well as the right to PASS a building in which NSRS has determined sufficient testing has been performed to verify coverage is acceptable within the building even if testing in all grid locations has not been completed. Any such grid locations within a mandatory building that are not tested will be recorded as a PASS in the template and the building will be recorded as a PASS on the template and in the final test report.

5.4 Individual Mandatory Building Test Analysis

The data logged by the four representatives on the grading template is then analyzed to determine whether the individual test grid meets the DAQ 3.4 definition.

An individual test grid location within a building is determined to PASS if both the inbound and outbound calls at that location have been scored as a PASS.

The building being tested is deemed to meet the digital voice quality coverage requirement if the percentage of test grid locations that receive a PASS score equals or exceeds NSRS's specified acceptance criteria, shown in Table 9.

All mandatory buildings will be tested. If Harris is denied access to a mandatory building to perform coverage acceptance testing, then that building will be scored as a PASS. NSRS may elect not to test all mandatory buildings, and any buildings thus not tested for convenience will likewise be recorded as a PASS.

Table 9 - Coverage Service Area and Acceptance Criteria

Mandatory or Critical Required Building	Maximum Building Loss (dB)	% Validated CPC Service Area Reliability Acceptance Criteria
FedEx Mustang Rd	18	95%
VA Hospital	18	95%
Red Rock FS	18	95%
Renown Medical Center	18	95%
Nugget Casino	18	95%
Mendive Middle School	18	95%
Sparks PD	18	95%
Ed Van Gorder School	18	95%
Stewart Facility	18	95%
Belrose Office Building	18	95%
Rawson-Neal Hospital	18	95%
Grant Sawyer	18	95%
AG Office	18	95%
Welfare & Support Services	18	95%
Department of Taxation	18	95%
Richard Bryan Building	18	95%
DHHS	18	95%
DMV	18	95%
NDOT HQ	18	95%
NDOT Hot Springs Annex	18	95%
State Capital building	18	95%
Legislature Building	18	95%
Ohm Service Center	18	95%
GOB	18	95%
Beltway Service Center	18	95%
Ryan Service Center	18	95%
Pearson Building	18	95%

5.5 Test Acceptance

Each mandatory building is evaluated separately. If the building's Voice Quality test meets the specified % Validated CPC Service Area Reliability Acceptance Criteria, the building passes.

If a mandatory building does not meet the coverage acceptance requirements, then additional tests will be made to determine if the loss characteristics of the failed test grid locations within the building exceed the maximum building loss specified below. If the measured building loss at a failed test grid is less than or equal to the County's specified maximum building loss, then the test grid will remain recorded as a FAIL. If the measured building loss for the test grid is greater than the County's specified maximum building loss, then that test grid will be discarded. The PASS/FAIL determination for the building is then recomputed discarding all test results that have a measured building loss greater than the specified building loss.

5.6 Building Loss Measurement Procedure

If a building fails the BER test, Harris will measure and compare the signal strength inside the building to an on-street signal strength measurement, using Harris' TYPHON or Storm wireless testing system. Measurements will be taken both immediately around the building as well as inside the building in a small area centered on each failed test location. The building loss at a test location is defined as the difference between the mean of the outside measurements minus the 95th percentile of the inside measurements at the failed test location. The 95th percentile is the signal level that is exceeded by 95% of the measurements.

5.7 Results Presentation

A test report is provided that includes:

- the name and location of each mandatory building
- the number and location of individual test grids within each building
- the identification of excluded areas/grids within each building
- a copy of the **Table 10** inbound or outbound grading template used by each grader for each building
- the % PASS/FAIL score for each building
- a statement of overall test acceptance or failure of coverage for NSRS.

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

Table 10 –Portable Indoor Coverage

Voice Quality Test Grading Template

Coverage Test Data for: Nevada Shared Radio System Date: _____

Requirement: DAQ 3.4

Building Loss Attenuator Value: N/A dB

Portable Attenuator Value: ____ dB

Check the link used: ☐ Digital Voice ☐ Base to Portable (outbound)
☐ Portable to Base (inbound)

Harris Evaluator:	NSRS Evaluator:
Organization:	Organization:
Test Radio:	Test Frequency:

Service Area Test Grid Number	Harris Grade	NSRS Grade	Remarks

(One row for each test grid/location)

Project Implementation Plan

Harris provides radio communication systems that support critical public safety operations, fulfilling the specific needs of its customers. The flowchart below shows the steps necessary to deliver a radio system that will replace the Nevada Department of Transportation's (NDOT) legacy system.

The implementation of such a large system will be completed in a phased, or regional approach. Each region will be handled as its own system, but with maintained focus on the interdependencies with surrounding regions and/or systems. A design period occurs first for the entire statewide system. Then the equipment for NDOT will be staged, installed, tested and cutover, region by region until the entire state-wide system is complete. The regions overlap to optimize the schedule and are staggered in time to optimize resources.

Design Reviews

Kick-Off Meeting and Preliminary Design Review

The project manager initiates project implementation with a Project Kick-Off Meeting, followed by a Preliminary Design Review. The Harris Team and NDOT will mutually agree on the timing of these meetings. The objectives of the meeting include:

- Introduction of all project participants
- Review of the roles of the project participants
- Review of the overall project scope, objectives, and deliverables
- Review of the current site status
- Review of NDOT owned site documentation
- Review status of NDOT site acquisition efforts, where applicable
- Review of the preliminary schedule

- Schedule detailed site surveys with NDOT, and/or site owner designated representatives
- Following site surveys, the project schedule will be updated to reflect actual site conditions. The updated schedule will also account for site accessibility conditions during the winter months
- The project schedule will also reflect updated billing milestones

Establish the communication methods, main POC's from each party
After the Kick-Off meeting, the Team will conduct detailed site surveys with NDOT. Harris will present the results of the detailed site surveys at the Preliminary Design Review Meeting.

Detailed Design Review (DDR)

The Harris Team uses the information obtained during the Kick-Off Meeting, Preliminary Design Review, site surveys, and regulatory and engineering documentation to deliver the final system design at the DDR. This will be defined on a per region basis.

The Harris Team presents rack elevation drawings, antennas placement drawings, antenna system drawings, documentation and all acceptance test plans during the DDR with NDOT. SOW Exhibit 3 contains the Responsibility Matrix for the DDR phase of the project.

Manufacturing and Staging

Immediately following NDOT's approval of the final design, the Harris Team procures material and schedules System Integration and Test using its Material Requirements Planning (MRP) system for the first region. Harris' Eagle Focus Factory assembles the RF equipment, integrates it with the key supplier items, and then tests each rack of equipment.

After assembly and test, each RF site rack will go through configuration, which consists of loading customer specific parameters and personalities into each applicable piece of equipment. The Network Switching Center (NSC) will undergo an imaging process. After imaging is complete, a Staging technician will perform a build and validation check against the NSC image. Staging technicians position the racks of equipment under factory Staging halos. The Staging technicians make all network connections for each site's equipment including RF, NSC, dispatch, interop, and other site types. Ethernet and/or fiber cable connections are made to

simulate backhaul networks and ensure the equipment connects to the network switches. The Staging Team programs radios to operate on a test user database programmed into the system during the NSC imaging process. The Staging Team verifies system levels and tests all features to confirm the system is ready for Factory Acceptance Test (FAT). Once a dry run FAT is completed by the Staging Team, the system transitions over to the system engineer for a week-long dry run of the FAT. During the following week, NDOT will visit the Eagle Focus Factory for a facility tour, introduction to the staged system, and to formally witness the FAT. The System Integration and Test responsibility matrix shown in SOW Exhibit 3 provides the staging activities that the Harris Team is responsible for and those activities that are the responsibility of NDOT. Each region of the State system repeats the manufacturing, staging, and FAT processes to meet the dates on the project schedule.

Shipping, Warehousing, and Inventory

After a successful Factory Acceptance Test (FAT), the Harris Team packages all system elements using established procedures depending on the mode of transportation. The Team engages appropriate freight carrier services to deliver NDOT's regional equipment to the Harris warehouse location in the State of Nevada or other mutually agreed to location.

Subscriber equipment may ship with mutual agreement of NDOT and Harris in coordination with Customer Care.

SOW Exhibit 3 contains the Responsibility Matrix for the shipping and inventory activities that the Harris Team is responsible for and those activities that are the responsibilities of NDOT.

System Installation

The Harris Team develops the installation plan during the detailed design phases of the project, and presents it to NDOT for review and approval. The installation plan includes equipment rack-up drawings, antenna location details, and installation procedures based on site surveys conducted by the Team, or designated subcontractors. The installation plan coordinates all activities of the project team, minimizing installation conflicts, and ensures that system implementation proceeds efficiently. The project team takes great care to ensure minimal disruption to existing EDACS service when installing the new P25 system in existing equipment locations. Site equipment installations follow industry standards, including Harris Grounding and Lightning Protection. The Team reviews the installation work to ensure implementation of these

standards.

Antenna Systems

A key aspect of the infrastructure equipment work is installation of the new P25 antenna systems. Installation of new antenna systems may occur on a newly constructed tower, existing towers in use by NDOT as part of their legacy radio system, or on existing towers that are not part of the legacy radio system. In the case of newly constructed NDOT-owned towers, antenna system installation is straightforward per the system design. For towers that are part of NDOT's legacy system, new antenna system installations must consider the location of the existing NDOT antennas, and the timing of their removal. Antenna system installation on existing towers that are not part of NDOT's current system are not impacted by the presence of legacy system antennas. However, NDOT must coordinate the location of the antenna systems on the tower with the tower owner when it is a leased site.

The Harris Team uses experienced tower crews to install the antenna systems. The antennas mount on side arm mounts, and support the RF cables with transmission line hangers secured to the tower cable ladder. The cables have ground kits that will be installed at the top, at the bottom as the cable leaves the tower, and at the end of the ice bridge before the cable entry port. Where applicable, grounding kits will be installed in the middle every 75 feet, so that there is no more than a 75-foot gap between grounds. The tower crew runs coaxial cables down the tower cable ladder, and onto the ice bridge terminating just inside the cable entry port.

After installation, the Team sweeps the RF transmission lines and antennas with an Anritsu Site Master, or equivalent cable-testing device, on the appropriate frequency band(s) to ensure proper performance. The Team records the baseline test data and provides it to NDOT. A copy will remain on-site for future reference.

Infrastructure Equipment

Upon completion of the tower work, installation crews install the base-stations, and associated equipment. The MASTR V P25 trunked stations and associated equipment typically mounts in 86-inch standard aluminum EIA 19-inch open-frame racks. The RF connections extend to the coaxial cables using appropriately sized jumper cables.

Harris assumes that NDOT-provided shelters will accommodate the height of these open racks,

and allow them to position to maintain the desired 36 inches of free aisle space (in front and in the rear). Racks and cabinets anchor to the floor using at least four anchor points. All racks will be installed in accordance to seismic zone 4 requirements.

Harris assumes that NDOT-provided shelters will have sufficient primary and back-up power systems.
Once the infrastructure racks secure in place, we ground and connect them to power, and technicians verify proper levels and settings preparing the site for the acceptance test.

NDOT personnel and/or their representatives are given advanced notice to prepare for their participation in acceptance testing. The installation team records the alignment and test data, and provides copies to NDOT. Copies of the individual site alignment and test data will be available at the sites. Installation crews also install and commission the network switches, dispatch consoles, logging recorders, alarm terminals, and other infrastructure equipment, per the detailed implementation plan.

SOW Exhibit 3 contains the Responsibility Matrix for antenna systems and infrastructure equipment, that is repeated for each region.

System Optimization

Upon installation of infrastructure equipment, the system engineer(s) works with the on-site technicians to optimize the equipment in preparation for acceptance testing.

- **Simulcast** – Per Simulcast cell, includes verify launch timing, verify timing drive test, iterative adjustments, repeat timing drive test (if required due to non-compliance to specifications), verify configuration, test voter, test network latency, verify network switches, and dispatch console operation.
- **Multisite** – Includes setting up site adjacency in the virtual network interface controller (VNIC), build roaming personality, drive test roaming and hand-off, and finalize roaming personalities.

Harris will conduct a preliminary Acceptance Test to determine that the systems are fully optimized and ready for the Acceptance Test with NDOT. SOW Exhibit 3 contains the

Responsibility Matrix for those tasks to be performed during the System Optimization phase for each Region.

Fleet Mapping

Fleet Mapping is the process used by the Radio System Administrator (RSA) to define regions, agencies, and talkgroups. NDOT's administrators create agencies by assigning an identifier to each agency, creating one or more administrators for the agency, and defining the "pools" of resources for the agency. The Agency administrators organize and configure their users, subscriber units (mobile radios), and consoles.

Harris will rely on input and direction from NDOT in the development of the fleet map. The new fleet map can be a carry-over from the existing one used today, or this can be an opportunity to streamline and generate a completely new fleet map. Either way, the fleet map will contain:

- Talkgroup IDs
- Agency definitions based on Work Unit or Division
- Emergency actions to be taken when a user declares an emergency
- Encryption capability for either persistent encryption or toggling on/off
- Roaming capability amongst NDOT sites, as well as surrounding systems
- Scan Priority and lists

Defining fleet maps as early in the project as possible allows flexibility for NDOT and the Harris Team to deliver and utilize radios early in the implementation. The Harris Team will work with NDOT's staff to develop templates for user radio programming promptly. Each template will have the basic features and functions defined for a user radio and user type (e.g. high-tier portable for public safety) such as talkgroups for their work department, control head displays, alias displays, and other information necessary for each user. In prior implementations, Harris customers benefitted by programming a small set of radios with the new fleet map templates. This approach affords them the opportunity to verify that a radio with the intended programming is really what is desired, or make changes to only a small subset of users.

Once the project team finalizes and NDOT approves the fleet map and templates, Harris starts mobilizing adequate resources to ensure timely fleet mapping and radio programming. Given the added benefit that Harris radios support both the existing EDACS technology and the new P25 communication protocols, this step can and should be taken prior to the migration over to the new system. All finalized fleet map documentation and templates will be provided as part of the final as-built documentation.

Coverage Testing

After the project team completes installation in a region, coverage testing will be executed. The Coverage Acceptance Test Plan (CATP) provided in this contract is preliminary. A final CATP will be submitted to NDOT for approval at the DDR and again 30 days prior to starting the coverage test.

Harris will complete coverage tests in cooperation with NDOT representatives. These tests include automated BER testing and Delivered Audio Quality (DAQ) tests. Harris will provide the lab test reports indicating that the radios have been tested and confirmed to meet the bit error rate that is equivalent to the required DAQ 3.4 audio quality. Both inbound and outbound automated BER tests will be performed over the entire service area. The DAQ voice call testing will be sampled over 10% of the number of tiles in urban areas across Nevada.

Harris' CATP is in conformance with the Telecommunications Industry Association (TIA) Telecommunications Systems Bulletin TSB-88-D titled "Wireless Communications Systems - Performance in Noise and Interference-Limited Situations - Recommended Methods for Technology-Independent Modeling, Simulation, and Verification." TSB-88-D has defined Channel Performance Criterion (CPC) as the specified minimum design performance level in a faded channel, and provides a set of Delivered Audio Quality (DAQ) CPCs that define subjective voice quality performance applicable to both analog voice and digital voice systems.

Harris fully complies with the Test Configurations section 6.5.D.5 of the Attachment 1 Scope of Services document. Coverage testing of a region will only commence after the components in that region have been fully tested at the system level.

Cutover & Migration Plan

Harris understands the importance of continuous end user communications for all personnel.

These users should be focused on carrying out their duties, and should not need to worry about what features their radio can support before, during or after the migration phase. The Harris strategy is to make the migration transparent to the end user by maintaining functionality throughout the migration process.

A safe and seamless transition from the current EDACS system to the new Harris P25 communication system is a critical advantage unique to the Harris solution. Safe means the transition over to the new system minimizes communications or system outages, while ensuring the safety for every user that carries a Harris radio. Seamless means that the expected functionality that NDOT uses every day is still available, while at the same time being complemented by the new functionality the VIDA system offers.

Harris fully understands that the migration plan is one of the critical components of the overall project. As such, the plans' goal is to meet the following objectives:

- Maintain reliable and stable mission-critical communications
- Complete, functional system deployment in a timely manner
- Integrate with existing systems
- Smooth transition from existing operations for users
- Definition of clear roles and responsibilities between Harris and NDOT
- Provide training for all users, administrators and service personnel

The implementation and migration of such a large system will be completed in a phased, or regional approach. Each region will be handled as its own system, but with maintained focus on the interdependencies with surrounding regions and/or systems. The regions will be installed, tested and activated one by one until the entire statewide system is complete. As regions are completed, NDOT agencies can be cutover for operational use. Figure 1 shows the preliminary regional breakdown. This plan is flexible, and can be adjusted to NDOT's needs.

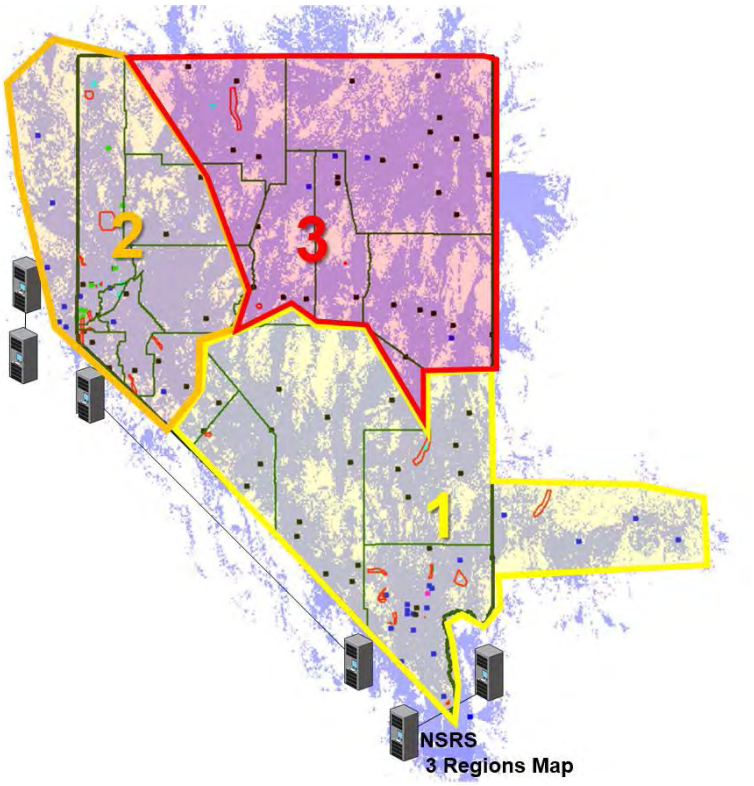
Harris will provide a detailed migration plan to NDOT at the Detailed Design Review. The final migration plan will detail the dispatch installation, migration phases, radio fleet transition, and details the site by site floor plans showing before, during, and after transition arrangements.

Planned system outages will also be covered in the plan, with the goal of minimizing or mitigating any from being required. NDOT will have a single point of contact and a backup for technical and logistical communications.

The plans presented to each Member will be very similar in nature, though the scope may change slightly depending on the encompassed entities within the defined boundary. Each plan will detail the fallback procedures should it be necessary to pull back off the P25 system. With proper planning and upfront communication, this event is unlikely to occur. One of the added benefits of the regional approach is that the scope of such an effort is smaller and can be refined as information and lessons learned are gained from earlier region's implementations.

Harris will work with NDOT on migration coverage areas, especially along regional borders, to ensure that NDOT's coverage needs are met prior to cutover and are aligned with expected coverage during the design. The individual agency cutover timelines will be dependent on the new coverage footprints being operational.

Figure 1. NSRS Regional Map



Harris implementation teams have been very successful in cutting over new systems. This is attributable to proper planning and execution by both the project team and the customer. Tools to achieve this include:

- Dedicated project team assigned to NDOT project implementation
- Developing a solid cutover plan between Harris and NDOT
- A customer-focused collaboration during the planning phases to build consensus and buy-in from user groups
- Mobilizing adequate resources to ensure timely fleet mapping and radio programming
- Providing seamless communications between the legacy system and the new infrastructure (i.e. use of the EDACS Migration Gateway outlined below)
- Continual dialogue and cutover support to address user concerns

Experience shows that when the user community is fully involved and can ask questions and voice concerns, the cutover experience is much more efficient with greater end-user acceptance. From the program's start, through fleet mapping and user training, the local Harris team works directly with NDOT's project team to capture concerns, answer questions, and modify the final plan to suit each user's needs.

Throughout the transition process, the Harris team will monitor the system and respond to every reported communication incident. This methodical and detailed process provides the highest level of quality and oversight throughout the transition and cutover needs.

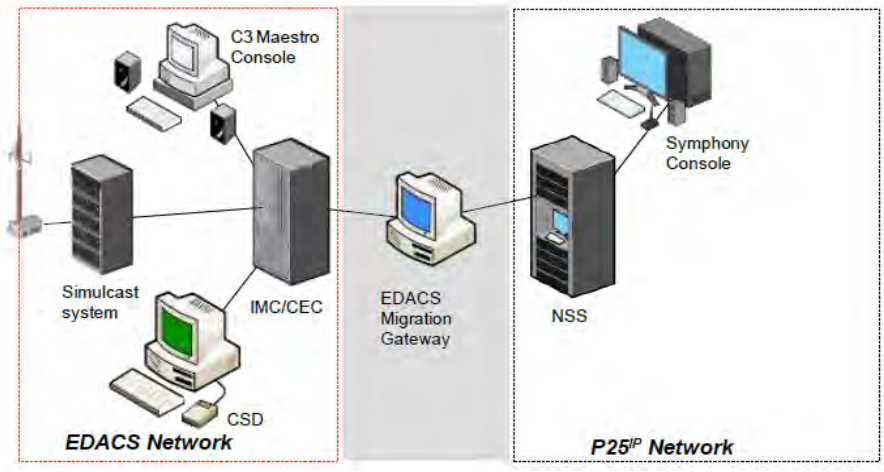
Migrating to the Power of IP

Many of NDOT's radios are capable of both EDACS and P25 modes, including Phase 1, with potential upgrade to Phase 2. Harris is providing NDOT with free EDACS software on any new P25 radios purchased as replacements for those radios that cannot operate on P25 as part of the system offering. The existing EDACS system will remain online and provide the existing coverage during the migration. As users are cutover to the new system, they will require reach back capability to the legacy EDACS system. Powered by the EDACS Migration Gateway (EMG), the Harris solution will provide full integration between the existing EDACS system and the P25 Phase 2 system. Unlike traditional gateways, the EMG is the only solution that can pass

the following features from EDACS users to P25 users during migration:

- Full range of P25 & EDACS IDs
- Transmission trunked group calls
- Patch and simulselect
- Emergency indicators/clears
- Caller IDs across the two systems
- Pre-empt EDACS calls from the Symphony consoles
- Encrypted call support
- Individual calls

A network diagram for the EMG is shown below. The EMG provides a suitable migration tool for maintaining interoperability with legacy EDACS systems via the latest VIDA network technology. Providing dispatch connectivity to both systems using a single screen and single headset, to listen to both systems, is a critical advantage of the Harris system during the transition period. With the provided dispatch configuration, the Harris Symphony console dispatches over both the existing EDACS network and the new P25 network. Dispatchers see full information and have full control over both networks from a single console.



Harris understands that NDOT is working with the other NSRS Members that are in the process of implementing a new IP-based microwave system and Harris has provided the bandwidth requirements for the system. (See VIDA Network WAN Requirements in System Description)

- 50 Mbps minimum between primary and secondary VIDA Premier cores

- 100 Mbps minimum between primary and secondary VIDA Premier/Connect cores.
- The dispatch sites require a minimum of 10 Mbps connection to the VIDA Connect Cores
- 1.5 Mbps minimum between RF site and Core
- Minimum simulcast distributive control point (DCP) layer 1 site link bandwidth to the microwave network is 5 Mbps
- Minimum simulcast layer 2 transmit site link bandwidth is 1.5 Mbps

221 Mbps minimum allocation over new microwave ring for connecting all cores, PSAPs and RF sites

Key Components of the Migration

Harris' primary goal for migration is to make the transition as transparent to the end user as possible by maintaining functionality throughout the migration process. Whether a user needs their Harris radio for administrative use or emergency response, the operational requirements they meet to perform their job will be enhanced on the Harris P25 system. The migration and cutover plan laid out in the following sections highlights the Harris strategy for each facet of the design, providing a summary of the strategy for each of the various subsystems in NDOT's portion of the NSRS P25 system. The following table identifies the RF sites in accordance to their assigned region.

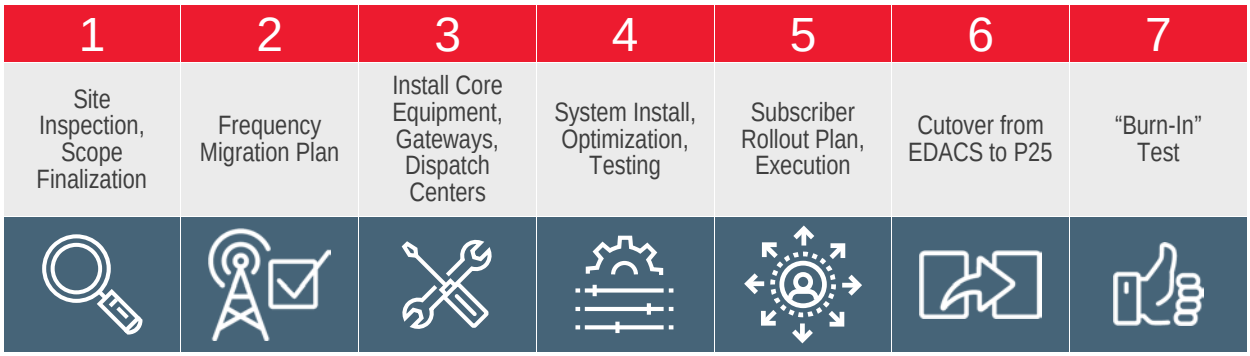
Region 0 RF Sites (Pilot Region)			
E/Cheyenne	E/Durango	E/Beltway RF	E/Decatur P25
E/Westside	E/Cabana	E/Sloan P25	E/Washington P25
E/Angels P25	E/Ryan Center		

Region 1 RF Sites			
E/Blue Diamond	E/Reid Gardner	E/Pipe Springs	D/White River P
E/Christmas	E/Silerhawk	E/Buckskin	D/Highland Peak

Region 1 RF Sites			
E/Big Horn	E/Apex	E/Page	D/Wilson
E/Laughlin	E/Lenzie	D/Coyote Springs	D/Sunnyside
E/Opal	E/Glendale	E/Pahranagat	D/Timber
D/Hoover Dam	D/Ragged Ridge	D/Alamo	D/Warm
E/Potosi	D/Mesquite	D/Irish	D/Fitzpatrick
E/Red Mountain	E/Beaver Dam	D/Caliente	D/Pilot Peak
D/Mercury	D/Schader	E/Indian Springs	D/Deer Creek
D/Red Rock	D/Millers	D/Brock	D/Palmetto
D/Sawtooth	D/Tempiute	D/Montezuma	D/Sober
D/Amargosa	D/Mt Charleston		

Region 2 RF Sites			
D/Kinkaid	E/Muller	W/Tahoe SC	W/Marble Bluff
E/TV Hill	D/Spooner Summit	E/Ophir	D/Toulon
D/Pinegrove	E/Pinenut	E/High Camp	W/Poito
W/Snowflake	D/Eagle Ridge	E/Alder Hill	W/Truckee 18
D/Bald West	D/Painted Rock	E/Beckworth	E/Likely
W/Biltmore	D/USA Highway	W/Chimney Peak	W/Fox
D/Fairview Peak	E/Patrick	W/Peavine	W/Fortyniner Mt
D/Hot Springs	W/Slide	W/Red Peak	W/Yellow Peak
D/Wildoat Mt	W/Smokey Quarts	W/Virginia Peak	E/Fencemaker
D/Imlay	D/New Pass		

Region 3 RF Sites			
D/Mt Moses	E/Connors Pass	D/Peavy Hill	E/Chevas
D/Mt Austin	D/Border Inn	D/HD Summit	D/Penn Hill
D/Prospect Peak	D/Victoria	D/Jackpot	E/Argenta
D/Buster Mountain	D/Spruce	D/Ellen Dee	D/Golconda
D/Currant Summit	D/Secret Pass	D/Elko Mountain	D/Winnemucca Mountain
D/Kimberly	D/3 Mile	E/East Twin	D/Trident Peak
D/Squaw Peak	D/Loray	D/Emigrant	D/Double H
D/Cave Mountain	D/Rocky Point	D/Mary's	D/Hickison
D/Flat Creek			



Stage 1 – Site Inspection and Scope Finalization

Harris' design approach uses as many of the existing sites in the current system as possible. There will be additional sites required as well. Harris outlines our site development and site equipment costs critical to support the P25 system in the pricing pages. We will finalize these costs from site surveys, and collected quotes from local contractors to perform the expansion work. Equipment installation is dependent on-site readiness and will be determined after site surveys.

Harris' solution accounts for these intrinsically challenging upgrades and new installations. The efforts require coordination, planning, and risk mitigation. Harris understands these efforts and is uniquely positioned to tackle them in this upgrade. After project kick-off, Harris will start this

process with the following critical activities to inspect sites, finalize scopes, and complete the Detail Design Review.

- Schedule site surveys with NDOT
- Perform structural analysis on the existing antenna structures to determine the capabilities to support the P25 antenna design loads
  - Any underperforming towers will require an additional change order and approved engineering drawings before antenna mounting work may proceed
- Perform an electrical load study at each site to determine the spare load available in the local panel. This information will inform the final Harris load transition plan to support the DC Power upgrade from the legacy system to the new P25 system.
  - Identified additional power needs will result in a change order and possible delays at the site.
- Finalize the physical rack and antenna installation plan given the constraints imposed by the RF equipment space.
- During site survey inspections the Harris team will identify and document any site upgrades that are required or recommended to support the new P25 system. During the DDR the Harris team will work with NDOT to finalize site civil requirements and submit a change order documenting the final site designs.

Below are the recommended site civil requirements to support the new P25 communications system. Following site surveys Harris will submit a report identifying required site upgrades, upon NDOT's approval a change order will be submitted to complete the necessary upgrades

Site Name	48 VDC Plant Current	Back-up Generator	Space Available for TX Antenna	Space Available for RX Antenna	Space Available for # Racks	Dual HVAC
3-Mile	142.5 amps	25 KW	25 Ft.	45 Ft.	4 racks	2 ton
Alamo	81 amps	25 KW	40 Ft	60 Ft	2 racks	1.5 ton

Site Name	48 VDC Plant Current	Back-up Generator	Space Available for TX Antenna	Space Available for RX Antenna	Space Available for # Racks	Dual HVAC
Amargosa Valley	81 amps	25 KW	140 Ft	160 Ft	2 racks	1.5 ton
Austin	127.7 amps	25 KW	5 Ft	20 Ft	4 racks	2 ton
Bald West	142.5 amps	30 KW	30 Ft	50 Ft	4 racks	2 ton
Border Inn	81 amps	25 KW	20 Ft	40 Ft	2 racks	1.5 ton
Brock	125.7 amps	25 KW	70 Ft	90 Ft	2 racks	2 ton
Buster	81 amps	25 KW	20 Ft	40 Ft	2 racks	1.5 ton
Caliente	127.7 amps	25 KW	100 Ft	120 Ft	4 racks	2 ton
Cave	142.5 amps	35 KW	45 Ft	65 Ft	4 racks	2 ton
Coyote Springs	110.8 amps	25 KW	60 Ft	80 Ft	2 racks	1.5 ton
Currant Summit	127.7 amps	25 KW	35 Ft	55 Ft	4 racks	2 ton
Eagle Ridge	172.3 amps	30 KW	40 Ft	60 Ft	4 racks	2.5 ton
Elko Mtn	187.2 amps	30 KW	30 Ft	50 Ft	4 racks	2.5 ton
Ellen Dee	142.5 amps	30 KW	40 Ft	60 Ft	4 racks	2 ton

Site Name	48 VDC Plant Current	Back-up Generator	Space Available for TX Antenna	Space Available for RX Antenna	Space Available for # Racks	Dual HVAC
Emigrant	81 amps	25 KW	40 Ft	60 Ft	2 racks	1.5 ton
Fairview Peak	142.5 amps	30 KW	5 Ft	20 Ft	4 racks	2 ton
Fitzpatrick	142.5 amps	30 KW	15 Ft	25 Ft	4 racks	2 ton
Flatcreek	81 amps	25 KW	30 Ft	50 Ft	2 racks	1.5 ton
Golconda	110.8 amps	25 KW	100 Ft	120 Ft	2 racks	1.5 ton
HD Summit	81 amps	25 KW	40 Ft	60 Ft	2 racks	1.5 ton
Hickison	81 amps	25 KW	40 Ft	60 Ft	2 racks	1.5 ton
Highland Pk	142.5 amps	30 KW	16 Ft	36 Ft	4 racks	2 ton
Hoover Dam	81 amps	25 KW	80 Ft	100 Ft	2 racks	1.5 ton
Imlay	110.8 amps	25 KW	40 Ft	60 Ft	2 racks	1.5 ton
Irish	81 amps	25 KW	45 Ft	65 Ft	2 racks	1.5 ton
Kimberly	95.9 amps	25 KW	40 Ft	60 Ft	2 racks	1.5 ton
Kinkaid	95.9 amps	25 KW	40 Ft	60 Ft	2 racks	1.5 ton
Loray	95.9 amps	25 KW	80 Ft	100 Ft	2 racks	1.5 ton

Site Name	48 VDC Plant Current	Back-up Generator	Space Available for TX Antenna	Space Available for RX Antenna	Space Available for # Racks	Dual HVAC
Mary's	172.5 amps	30 KW	20 Ft	40 Ft	4 racks	2.5 ton
Mercury	95.9 amps	25 KW	30 Ft	50 Ft	2 racks	1.5 ton
Mesquite	157.4 amps	25 KW	50 Ft	80 Ft	4 racks	2.5 ton
Millers	81 amps	25 KW	40 Ft	60 Ft	2 racks	1.5 ton
Montezuma	81 amps	25 KW	30 Ft	50 Ft	2 racks	1.5 ton
Moses	127.7 amps	25 KW	40 Ft	60 Ft	4 racks	2 ton
New Pass	81 amps	25 KW	60 Ft	80 Ft	2 racks	1.5 ton
Palmetto	81 amps	25 KW	40 Ft	60 Ft	2 racks	1.5 ton
Peavy Hill	157.4 amps	30 KW	40 Ft	60 Ft	4 racks	2.5 ton
Penn Hill	127.7 amps	25 KW	40 Ft	60 Ft	4 racks	2 ton
Pilot Pk	127.7 amps	25 KW	5 Ft	25 Ft	4 racks	2 ton
Pinegrove	142.5 amps	30 KW	5 Ft	30 Ft	4 racks	2 ton
Prospect Pk	157.4 amps	30 KW	40 Ft	60 Ft	4 racks	2.5 ton
Ragged Ridge	81 amps	25 KW	40 Ft	60 Ft	2 racks	1.5 ton

Site Name	48 VDC Plant Current	Back-up Generator	Space Available for TX Antenna	Space Available for RX Antenna	Space Available for # Racks	Dual HVAC
Rocky Pt	110.8 amps	25 KW	40 Ft	60 Ft	2 racks	1.5 ton
Sawtooth	110.8 amps	25 KW	8 Ft	8 Ft	2 racks	1.5 ton
Schader	81 amps	25 KW	45 Ft	65 Ft	2 racks	1.5 ton
Secret Pass	81 amps	25 KW	40 Ft	60 Ft	2 racks	1.5 ton
Sober	127.7 amps	25 KW	10 Ft	30 Ft	4 racks	2 ton
Spooner	81 amps	25 KW	60 Ft	80 Ft	2 racks	1.5 ton
Spruce	157.4 amps	35 KW	35 Ft	55 Ft	4 racks	2.5 ton
Squaw Pk	127.7 amps	25 KW	45 Ft	65 Ft	4 racks	2 ton
Sunnyside	95.9 amps	25 KW	30 Ft	50 Ft	2 racks	1.5 ton
Timber	81 amps	25 KW	20 Ft	40 Ft	2 racks	1.5 ton
Toulon	157.4 amps	30 KW	5 Ft	20 Ft	4 racks	2.5 ton
Trident Pk	127.7 amps	25 KW	25 Ft	45 Ft	4 racks	2 ton
Victoria	81 amps	25 KW	20 Ft	40 Ft	2 racks	1.5 ton
Warm Springs	142.5	30 KW	16 Ft	36 Ft	4 racks	2 ton

Site Name	48 VDC Plant Current	Back-up Generator	Space Available for TX Antenna	Space Available for RX Antenna	Space Available for # Racks	Dual HVAC
Wildoat	95.9 amps	25 KW	50 Ft	70 Ft	2 racks	1.5 ton
Wilson	95.9 amps	25 KW	40 Ft	60 Ft	2 racks	1.5 ton
Winnemucca	142.5 amps	30 KW	30 Ft	50 Ft	4 racks	2 ton
Deer Creek	81 amps	25 KW	60 Ft	80 Ft	2 racks	1.5 ton
Double H	81 amps	25 KW	60 Ft	80 Ft	2 racks	1.5 ton
Hot Springs	110.8 amps	25 KW	180 Ft	200 Ft	2 racks	1.5 ton
Jackpot (NDOT constructing)	81 amps	25 KW	40 FT	60 FT	2 racks	1.5 ton
Mtn Springs	81 amps	25 KW	80 Ft	100 Ft	2 racks	1.5 ton
Painted Rock (NDOT constructing)	110.8 amps	25 KW	60 Ft	80 Ft	2 racks	1.5 ton
Tahoe Mtn	81 amps	25 KW	60 Ft	80 Ft	2 racks	1.5 ton
Tempiute	81 amps	25 KW	80 Ft	100 Ft	2 racks	1.5 ton

Site Name	48 VDC Plant Current	Back-up Generator	Space Available for TX Antenna	Space Available for RX Antenna	Space Available for # Racks	Dual HVAC
USA Pkwy (NDOT constructing)	95.9 amps	25 KW	60 Ft	80 Ft	2 racks	1.5 ton
S. of White River	81 amps	25 KW	180 Ft	200 Ft	2 racks	1.5 ton

Stage 2 – Frequency Migration Plan

The process for developing a Statewide frequency plan is a long, intensive and often iterative process. Harris has taken the first step in developing a frequency plan for the P25 system by evaluating spectrum availability. Harris' goal is to reuse as many of NDOT's current spectrum holdings as possible while also looking to implement *additional channels* to provide for coverage testing and avoid impacting the EDACS users during the multi-year cutover period. A final and comprehensive frequency plan will be provided at the DDR. Harris will work to completely build out the P25 site alongside the existing EDACS sites, allowing for a smooth and logical cutover.

Harris plans to implement a phased, or regional, cutover, thus allowing the 800 MHz EDACS frequencies to be placed back into the P25 pool for reuse. This plan mitigates risk, and allows the new P25 system to be fully vetted, and loaded at NDOT's discretion. In addition, Harris will put forth the due diligence in determining the viability of using any available 700 MHz channels. Harris will provide NDOT with a draft frequency plan before DDR. In addition to the plan, a report will be provided which substantiates the ability to license frequencies associated with the plan.

Finally, Harris' frequency plan mitigates these additional risks.

- Minimum of 250 kHz of channel separation within any sites' transmitter combiner
- Minimum of 50 kHz of channel separation between any channel assigned in overlap areas of the network
- No interference with existing system frequencies during the various migration phases

Stage 3 – Installation of Core Equipment, Gateways, and Dispatch Centers

New core equipment is being provided for NDOT, which gives Harris the ability to build out in parallel with the existing EDACS core, and move resources over to the new core while maintaining a connection back to the EDACS system via the EMG.

Harris will install the core equipment for all NSRS members during the rollout of region 0 allowing the Harris team to turn RF sites on as we move through the regions.

Once the new core is in place and connected to the microwave ring, Harris will make it operational and begin the testing of the new core. Other subsystems that will be installed in the system with the new core include:

- New Network Management System (NMS)
- EDACS Migration Gateway (EMG)
- New centralized Logging Recorder

These devices must be cutover to the new core prior to the transition of dispatch operations.

The migration plan includes steps to evaluate the maintenance or replacement of current gateways, or other interfaces to analog or non-P25 systems. This will prevent loss or degradation of connectivity during migration. Users on either the existing EDACS system or new P25 system will have access to all system resources prior to transition. Harris will work with NDOT to prevent loss or degradation of connectivity with outside agencies by determining what systems and interop agencies are critical to the operations within a region during the migration. This step is critical in terms of *risk mitigation*, allowing NDOT to maintain operation on the current EDACS system before any sites or dispatch consoles are moved to the new network.

DISPATCH MIGRATION

Harris understands the important role of the dispatcher regarding critical communications, and we developed our newest Symphony console to simplify dispatch operations and empower dispatchers. With console space restrictions in mind, Harris designed the Symphony console to require minimal space in already tight dispatch centers.

Harris installers will work with NDOT's Dispatch Centers to custom design their console screen layout to meet the individual dispatcher needs. Likewise, the Symphony console supports individual dispatcher login and personalization to provision dispatcher specific settings from the network so dispatchers can access their specific settings at any dispatch console location and not be tied to a specific workstation location.

With the EDACS Migration Gateway, dispatchers can access both P25 and EDACS talkgroups, allowing a seamless transition to the new system. As users transition to P25 from EDACS, dispatchers will be there every step of the way, leveraging their new dispatch consoles to operate both systems. The EMG provides the capability to operate all the scenarios outlined below:

- New Symphony Consoles dispatching on EDACS
- Existing Consoles dispatching on P25
- Backup control stations can also operate on both systems with multi-mode software
- Having both existing and new consoles in operation at the same time

A Harris technician or console trainer will be on hand during the cutover period as each shift begins to train the dispatchers on use of the new consoles. The guidance provided to the dispatchers will ensure a smoothly running operation. Dispatch consoles can be installed prior to or during migration thanks to the benefits the EMG provides.

Installing consoles in a 24-hour dispatch center requires consideration of minimum staffing as well as operational peak times. Harris will interview the dispatch center managers to identify downtimes, console availability and operational peak times to schedule console installs accordingly. Evening or weekend console installation can be scheduled as well, should NDOT feel it is beneficial to install consoles at non-peak operational times.

Realizing that operations must continue while consoles are being installed, console installations will occur using hand tools rather than power tools (as much as practical) to limit background noise in the dispatch center. Typical console installation requires approximately two to three hours per installer. Harris will provide additional installers as necessary to meet console availability and to install consoles at the allowable pace at each individual dispatch center.

Once up and running, dispatchers can transition to the new platform with proper training to *handle all operational requirements* including administration, day-to-day operations, emergency response, and how to handle catastrophic events on the new platform.

NEW NETWORK MANAGEMENT SYSTEM INTEGRATION

The new core equipment has its own built in network management platform. Harris *recommends system training* on the new platform to bring system administrators up to speed on the latest feature available. Once the core is in place, NDOT administrators can begin using the new Network Management System immediately.

Stage 4 – System Installation, Optimization & Testing

Once the VIDA core and dispatch capabilities are operational, Harris is ready to finalize the installation, optimization and cutover to the P25 system on a regional basis. Harris will install all P25 site equipment in parallel to existing EDACS equipment at existing facilities. Prior to commencing user cutover within a region, Harris will fully test and optimize the new system to ensure that all functional and coverage acceptance test plans have been completed, and the system is ready. This includes the completion and signoff of the Functional Acceptance Test Plan (FATP) and Coverage Acceptance Test Plan (CATP) procedures, per region. This critical step minimizes risk and ensures the region is ready for cutover.

Stage 5 – Subscriber Rollout Plan and Execution

Harris can safely move EDACS users over to P25 during the transition with a single radio device. This is accomplished using dual programming of both EDACS and P25 modes. All existing subscribers capable of P25 Phase 1 or Phase 2 operation can be upgraded and programmed ahead of the transition date. Harris strongly encourages NDOT to provide new radios to users that will be operating in a region before migration starts for that region. By orchestrating this programming effort ahead of the actual migration, radios can be fielded in advance to minimize disruption, and not require the need to pull users out of service. This also prevents users from having to carry two radios at any point during the transition. EDACS operators will continue to use their EDACS talkgroups all the way up to their transition date. For mobile users, their radios can be installed and programmed ahead of time, which limits how many users need to be taken out of service for the cutover date.

On their cutover date, users will be trained on how to switch modes on the radio, the differences between analog and digital modes of operation, and what talkgroups are available to them in P25 mode. This training will cover administrative use, day-to-day operations, how to handle emergency events, and what occurs on the radio in the event of catastrophic failures. Careful consideration of fleet mapping up front will minimize reprogramming efforts that can prove costly and timely for the users. The new fleet map structure will closely resemble the existing EDACS structure since primary EDACS talkgroups will be bridged to the same P25 talkgroups. Once on the P25 system, users will likely not know the difference between users that have transitioned, and those that haven't on their primary talkgroups.

The final radio procurement and upgrade plan will be finalized at Detail Design Review (DDR). Harris will work with NDOT to identify the number and type of existing radios they wish to upgrade, as well as the quantity of new radios they want to procure. Once these radio quantities are finalized, Harris will provide a detailed plan to accommodate the programming, training, install and removal of radios into the final migration plan. In general, Harris intends on using the EDACS migration gateway and mixed mode radios (i.e. radios that support both EDACS and

P25 operation) to provide a flexible and seamless migration.

Once an entire talkgroup moves to the new P25 network, the EMG talkpaths are available for the next talkgroup. Throughout the transition, legacy system users will always hear audio and see emergencies from those that are on the new P25 network and vice versa. Training will be provided in alignment with the migration plan to ensure each user is fully capable of operating the new radio.

User cutover within a region occurs once the new P25 network system is tested and accepted. Once ready for transition, Harris' strategy is to move radio users by functionality (public services, police, fire, etc.) but is flexible in their approach and looks forward to working with NDOT to finalize the plan. Throughout the transition, the Harris team will monitor the system and respond to communication incidents. With dual operation, fallback is seamless to the existing EDACS system.

User Radio Equipment Implementation

Harris will be responsible for programming and installing radios. The project team will coordinate the distribution of portable radios and accessories with NDOT. In addition, the project team will begin mobile installations for the initial group in concert with the training schedule. Technicians and subcontractors will equip vehicles with new mobiles in accordance with a schedule created by NDOT and mutually agreed upon by Harris. Harris will work with NDOT to identify installation areas where old mobile radios will be swapped out for new mobile radios.

Technicians and subcontractors experienced with user radio operations will be available to answer any last-minute questions. Harris will ensure that the subcontractors perform the work to Harris specifications and that they leave the work area as it was found at the end of each day.

To identify the specific radios assigned to individuals and vehicles, the project team will provide an inventory list of all radios, including serial numbers, calibration data, and radio programming information. The cutover team will work together to schedule the delivery of the radios to each user shortly before they go live on the new P25 system. As required, installations will consist of completely placed, anchored, and installed equipment, including the placement of associated cabling, appropriate layout, and full testing of the radio. Harris will provide associated power

supplies and any other hardware, adapters, and/or connections to deliver a complete operable user radio to NDOT at the time of field acceptance.

User Equipment

The Harris Team and NDOT personnel will develop a mutually agreeable cutover schedule. The Harris Team will provide overall management and planning of the installation and test activities, while its subcontractors perform the installations. The Harris Team will schedule and coordinate the user training and distribution of the portable and mobile user equipment per the cutover plan installation schedule. All mobile radio installations will be closely coordinated with NDOT and participating user agencies, to minimize disruption to their operation, and to reduce out-of-service and unproductive time.

Radio Installation Planning

Mobile Radio Installations*	Portable Radio Distribution*
Harris *Knows* mobile installs: ▪ Require extensive planning and coordination ▪ Remain with the vehicle for years ▪ Have a need for collaborative planning/continuous quality management = decreased end-user agency impact ▪ Can be accomplished ahead of cutover dates due to Harris' ability to support both EDACS and P25 modes of operation	Harris *Knows* portable distribution: ▪ Can occur concurrently with mobile installs, but ***encourages*** distributing ahead of time due to the capability of supporting both EDACS and P25 modes of operation ▪ And if the user's legacy radio is not a P25 Phase 1 or 2 capable radio, the user will turn it in and walk away with the new P25 Phase 2 radio(s) ▪ And if the user's existing radio is P25 Phase 1 or 2 capable, NDOT has the option to upgrade the radio to P25 Phase 1 or 2

*Harris will be responsible for updating each system users radio equipment to operate on the network before, during, and after system migration.

Stage 6 – System Cutover from EDACS to P25

Our migration solution installs the new system in parallel with the legacy system. All installations and verifications will complete prior to starting the migration. Therefore, Harris expects little downtime as users migrate from the EDACS system to the new P25 system because of the parallel systems approach. Momentary downtimes may occur when de-activating a frequency on the legacy system and activating that frequency on the new P25 system. However, as the frequency plan outlines, the new system only uses a small subset of channels from the legacy system. Harris expects to perform frequency migrations during off-peak hours during scheduled windows of time to reduce impacts.

With the EDACS Migration Gateway in operation, NDOT can migrate users to the new system as entire disciplines, while maintaining the legacy communication infrastructure if users need to switch back to the legacy system. Since critical communications between systems will support trunking features such as IDs and emergencies, end users will have constant communications between both the EDACS and P25 system so that they can still communicate with users that have not completed migration.

Harris will provide a detailed cutover plan as part of Detail Design Review, which will incorporate NDOT's suggestions for which regions should be upgraded first, the order of those regions, and traffic analysis outlining the results on both the legacy EDACS and new P25 system during each transition step.

Final Acceptance Testing

The Harris Team will perform systems acceptance testing per the agreed upon final acceptance test plan (FATP) for each region. The Harris Team will provide two weeks written notice to NDOT when installation and optimization are complete, the FATP has been fully dry-run successfully and the system is ready for acceptance testing. The following is a sample outline of Harris' FATP.

- Facility Test - Visual Inspection
- VIDA Universal Administration Server (UAS) Operation
- Encrypted Voice Operations
  - Single site, Multisite and Console encrypted group calls
  - Encrypted Individual (Private) Calls
- Over the Air Rekeying (OTAR)
  - Includes Rekeying and Changing Over a Crypto Net, plus Zeroing subscribers
  - Rekeying a Console
- Redundant Wide Area and High Availability Router Failover
- Site Activity using the Activity Warehouse
- VIDA Regional Network Manager
  - Reporting of RF System Alarm Indications
- Enterprise Network Manager (ENM)
- P25 Station Reconfiguration using the Device Manger
- NSS Switchover
- Control Point Movement
  - DCP Forced Control Point Movement
  - DCP Control Point Movement in response to Faults at the Active Control Point
- P25 Trunked Calls and Site Features
  - Includes Emergency calls, All-Call, Call Priority and Scanning
- Transcoder Operation
- P25 Phase 2 Functionality
  - Includes Mixed-Mode and standard call operation
- Symphony Dispatch Platform Features and Operation

  - Includes Emergency Calls, Pre-empt, Patching, Simulselecting, Console Cross-mute
- Trunked Logging Recorder Operation
- P25 Simulcast Bypass Operation
- VIDA Interoperability Gateway Tests

The system engineer provides documentation defining each of the test areas. The FATP procedures contain a short description, test methodology, and a record form for logging results and acceptance signatures for each test. The Harris Team uses a punch list to document any issues found, so the team can quickly resolve them. Follow-up tests and documentation will show the correction of open items. Upon satisfactory completion of each testing phase, the project manager will present the system acceptance documentation to NDOT's project manager(s). The project team and NDOT can proceed with cutover of a region with each approval NDOT provides.

SOW Exhibit 3 contains the Responsibility Matrix for Final Acceptance Testing activities performed by Harris, and those activities that NDOT will perform for each region.

Stage 7 – "Burn-In" Test

The new P25 radio system will undergo a 30-day burn-in period encompassing 30 consecutive days of uninterrupted operation following cutover for each region of the system implemented, as well as the complete statewide system. The 30-day burn-in period is intended to demonstrate reliable system operation. Several important aspects of the reliability test are to have no disruption in communication, and to have no reduction in the quality of communication. Failure modes, categories, and correction scenarios will be topics to be discussed.

Major failures might include items such as a complete loss of network switching capability, loss of wide area trunking mode operation, complete loss of simulcast control point equipment, etc.

In general, a major system failure will result in the test period being stopped and restarted from zero after correction of the issue.

Minor failures could include any non-critical failures that don't affect trunking or system operation. In general, minor system failures do not result in testing being suspended. Minor system failures are added to an incident report tracking document and these items are addressed while reliability testing is on-going.

At the completion of the 30-day burn-in period, the project manager will arrange a meeting with the field service team to review maintenance support during the warranty period. The team will provide the contact information and procedures used to obtain service during the warranty period for standard business hours and after hours.

APPROACH

The Burn-in Period Test will be conducted once the System Acceptance Test Plan and Coverage Acceptance Test Plan have been successfully completed and users loaded on the system for that region. During the test, the region shall operate for a period of 30 accumulated calendar days without a major failure relating to hardware or software infrastructure. Neither the (Customer) nor Harris shall perform any system maintenance during the test unless mutually agreed upon in writing.

During the test, records of hardware and software failures will be collected, evaluated and resolved as required. The failures will be classified as a "Critical System Failure", an "Intermediate System Failure", or a "Minor Failure" (as defined below in 2). The test will be successfully completed upon the completion of a 30 calendar day period without the occurrence of a "Major System Failure". Event failures could either stop and reset the cycle time, or temporarily pause the Burn-in Period test, but have no effect on the 30 calendar day overall testing period.

Harris and NDOT shall assign a primary and secondary point of contact which will be available at all times during active testing of the region. These contacts will comprise the "test committee". Any in-process failures will be reviewed by both parties, a determination made as to the actions to be taken, and the effect on the test clock following the guidelines and definitions of failures

below. During this time, all documented issues will be logged, evaluated, resolved and reviewed by the test committee.

MONITOR AND CONTROL

The Regional Network Manager (RNM) application will be used to monitor system health status. The Harris project engineering team will require VPN Remote Access to NDOT's network in order to perform remote monitoring and diagnosis of the LMR System.

Site and terminal configurations will be locked during the Burn-in Period Test preparation. Any mutually agreed changes will be documented and become a part of the test report.

FAILURE DEFINITIONS AND SAMPLES

Figure 2. Failure Types

Failure Types	Description
Critical	A Critical failure of the system during this test will cause the thirty (30) day burn-in period and warranty to reset and restart from the beginning after completion the repair. A critical failure is defined as follows: • Any failure which causes a loss of fifteen percent or more in capacity or coverage in any cell • Any failure which causes a loss of the primary core • Any failure which causes a loss of simulcast capability • Any system failure that causes the loss of two or more console positions • Any failure that renders the logging recorder inoperable or causes the irretrievable loss of recorded audio • The concurrent failure of two (2) or more repeaters • Concurrent failure of two (2) or more switches and/or routers • Failure of the receiver voting system • Two (2) or more repetitive minor failures of the same functionality with or without the same root cause

Failure Types	Description
Intermediate	Defined as Harris supplied hardware or software failure which INTERRUPTS 30-Day Burn-in Period Test and will STOP testing. Harris and/or its authorized repair service will make the necessary repairs/adjustments, and the 30-calendar day test period will be re-started at the point that it was discontinued and will continue until the sixtieth day occurs without further interruptions. For example, if failure occurs on Day 15 of the reliability test, repairs will be made, and the Burn-in Period Test will restart and continue on Day 15. The Burn-in Period Test will then be deemed successfully completed when Day 30 is completed without further interruptions of failures. Two or more intermediate failures will constitute a major failure and therefore the burn-in period will stop and a new test period will have to be restarted once the issue has been resolved.
Minor	A minor failure will cause the burn-in period to temporarily hold until the issue has been fully resolved to the Members satisfaction. On approval, the burn-in period can resume. The Members will accept a maximum two (2) minor failures before a full reset of the burn-in period will be required. Two (2) or more repetitive minor failures of the same functionality with or without the same root cause shall be defined as a major failure. Two (2) or more of the same minor failure without the determination of cause will temporarily hold the burn-in test until a cause is found, confirmed and corrected, or the Members are satisfied there is little likelihood of a systemic recurring issue
Other	Defined as one or any combination of the following type of events considered out of Harris' Control: Radio call failures in "known" poor coverage areas, non-Harris customer provided equipment such as the backhaul, commercial power failures, customer staff/operator errors, previously agreed system maintenance downtime and/ or harsh environmental conditions or acts which cannot be prevented. Testing will stop while troubleshooting occurs.

System failure definitions are shown in Figure 3.

Figure 3. System Failure Definitions

Item	Failure Description	Critical	Intermediate	Minor
A	Complete Loss of Network Switching capability.	X		
B	Loss of wide area trunking mode of operation.	X		
C	Base station failure	X		
D	Loss of simulcast control point equipment.	X		
E	Failure of 20% or more dispatch console positions including control stations.	X		
F	A software failure or download or any intervention by a Harris software developer or programmer on the radio system infrastructure components resulting in a service outage that would otherwise be classified as a major failure.	X		
G	Failure of the radio system infrastructure to properly recognize the emergency alert from a terminal subscriber.	X		
H	Complete Loss of Network Management capability.		X	
I	Loss of more than ten percent traffic capacity of the user base.		X	
J	Failure of any single Network First Gateway interface equipment between the Gateway		X	
K	Any non-critical failure that does not affect trunking operation			X

Item	Failure Description	Critical	Intermediate	Minor
L	Any user terminal equipment			X
M	Single Console position			X

Test Planning Procedures

Prior to the start of the 30-Day Burn-in Period Test, the following activities must take place:

- System Acceptance Test Plan completed
- xxxx users identified (full radio cutover completed for the region)
- User training completed
- Test Committee members identified
- Team meeting with users and test committee to review the test plan and failure definitions and examples
- Issue reporting process reviewed and approved

FAILURE REPORTING

Upon observing a system issue, the user will complete the Radio System Issue Report (**Figure 4**) and submit it to the test committee within 12 hours. Upon receipt of the issue report, the Harris representative will log the report and make a preliminary classification of the issue and report it to the Test Committee within 12 hours of receiving the report. Should the issue be classified a major failure, the test will be halted until resolved.

All reported issues will be logged documenting the details of the issue resolution. Should the initial classification be disputed by another member of the test committee, the committee will meet within 24 hours to review the issue and reach agreement on the classification. The test will continue until the team meets and reaches agreement.

In the unlikely event that the test committee cannot reach consensus on the issue classification, or restart of the test after a major failure, the Harris Project Manager and NDOT Project Manager will meet and discuss. If they cannot reach agreement, the test will resume and the issue will be referred to the Dispute Resolution Board.

Weekly meetings will take place to review the progress of the test, discuss issues identified and their resolution. Attendees of the meetings will include the Test Committee and others as identified by APS and Harris Project Managers. The Harris Project Manager will document and distribute meeting minutes and action items for each meeting.

Figure 4. NDOT P25 Radio System Issue Report Form

Name/User:				
Date:				
Time:				
Location:				
In Building (Y/N):				
GPS Coordinates:				
Agency:				
User ID:				
Talk Group/Channel:				
Selected System:				

Issue Description

Scheduled Maintenance or Intermediate Failure (see Fig 2 above for definitions)

Upon completion of the maintenance or resolution of the failure, the test shall resume as if the maintenance or failure had not occurred (i.e. if the test is stopped on day 5 for maintenance, it would then resume on day 6 after the maintenance is complete).

MAJOR FAILURE

Should a major failure occur, the Harris team will take prompt action to evaluate the issue and implement corrective action. After resolving the issue, the Harris project manager or engineering manager will document the resolution and provide notice of restarting the test at day 1.

RESOURCES AND DESIGNATIONS

Harris and NDOT will determine the necessary resources to execute and monitor the testing and ensure they are available to meet, perform, and complete the technical requirements as agreed upon. Such resources include personnel, facilities, site access, and the assistance of required NDOT personnel to conduct testing. Identified and agreed upon resources will be made available such that there is no impact to the cycle-time of the reliability test and performance of the task.

ACCEPTANCE

As identified on the project schedule, upon successful completion of the 30-Day Burn-in Period Test, Harris will submit the results of the test including a summary of issues and descriptions of resolutions performed. A joint meeting will follow, at a mutually agreeable location, to review the test documentation and obtain acceptance and agreement that the Burn-in Period Test was successfully executed, completed and approved.

Conclusion

Our philosophy is to maintain existing operations throughout the transition process. This continuous radio communications operations approach minimizes impact on the users until and during the time of transition. Harris will commit to the following:

- Uninterrupted operability between the new and existing radio system during transition
- Continued communications on normal and interoperability talkgroups in place today
- Single radio use during the transition and the operation of the new Harris radio device will stay consistent with existing operations

- Single dispatch console use during the transition

Warranty Plan

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Scope of Warranty Plan

SERVICE PROVIDER will provide this Warranty Plan ("Warranty Plan") for a projected forty-two (42) months for Region 1, twenty-seven (27) months for Region 2 and twelve (12) months for Region 3 such that all warranties end on the same date for Infrastructure Equipment and Software per the preliminary implementation schedule contained in Exhibit 4 – Project Schedule

If there are DEPARTMENT caused schedule delays beyond the projected implementation schedule from the acceptance of Region 1 to the acceptance of Region 3, SERVICE PROVIDER reserves the right to charge the DEPARTMENT an additional amount to compensate for schedule delays (i.e. Warranty extension).

Harris will also provide a 2-year warranty on Terminal Hardware from the date the hardware is put in service by the DEPARTMENT.

SERVICE PROVIDER is providing standard Warranty services packaged with additional Premium Warranty services for the Warranty Plan. The scope of the Warranty Plan is listed in Figure 1 and described individually in Statement of Works (SOWs).

Figure 1. Warranty Plan Scope of Services

Scope of Services	Standard and Premium Services During Warranty		
	NDOT	NVE	Washoe
Depot Repair and Return	YES	YES	YES
Priority Technical Assistant Center (P-TAC)	YES	YES	YES
Tech-Link (included in P-TAC)	YES	YES	YES
Software FX with SUMS - Harris Infrastructure and Subscribers	YES	YES	YES
Software Maintenance - Tait Infrastructue and Subscribers	YES	YES	YES
Software FX with SUMS and Tait Software Maintenance Installation	YES	YES	YES
Issue Resolution Support	YES	YES	YES
Preventive Maintenance (Infrastructure)	YES	YES	YES

Equipment Covered

The Warranty Plan covers all Equipment and Services provided by SERVICE PROVIDER under the Agreement as listed in Exhibit 5 – Equipment List.

Reused equipment is not covered by this Warranty Plan. Console upgrade software to Windows 10 is covered by this Warranty Plan but not the physical console hardware. The physical hardware is considered reused equipment.

DEPARTMENT Performed Warranty Repair

SERVICE PROVIDER provides DEPARTMENT the ability to perform maintenance and/or repairs during the Warranty Period without voiding or affecting the SERVICE PROVIDER's warranty or other responsibilities with proper, documented training. DEPARTMENT will provide all First Echelon support as outlined in the Issue Resolution Support SOW contained in this Warranty Plan.

DEPARTMENT technicians conducting warranty service work must complete the following technical training to be authorized to conduct the service work.

Figure 2. Technical Training Required

System Administration Training

Course Name	Course No.
P25 System Overview	YTSN4F
Unified Administration System	YTSN6B
Regional Network Manager	YTSN3V
Over-The-Air Rekeying	YTSN6C
Radio Programming & OTAP	YTSN6X

In addition to the classroom training, the technicians need to take the online System Administrator/Manager web-based training package through HTU.

- P25 Fleet Mapping Overview
- XL-200P Radio Operation
- Symphony Console Operation
- Radio Programming Overview
- Advanced Access Control (AAC)
- Radio Personality Manager (RPM & RPM 2)
- Unified Administration System (UAS) Overview
- Regional Network Manager (RNM) Overview
- Enterprise Network Manager (ENM)
- Over-The-Air Programming (OTAP)

- Active Directory
- Activity Warehouse
- Over-The-Air Rekeying (OTAR) Fundamentals
- Inter-RF Subsystem Interface (ISSI) Fundamentals

Radio Infrastructure Training

Course Name	Course No.
P25 System Maintenance	YTSN6D
Network Operation and Maintenance	YTSN3W
MASTR V Station Maintenance	YTSN8G
P25 Simulcast System Maintenance	YTSN8H
Tait P25 Conventional Configuration & Maintenance	YTSN4M
Regional Network Manager	YTSN3V

Radio Subscriber Training

Course Name	Course No.
RF Maintenance	YTSP7P

Work that is performed by a DEPARTMENT technician that has not been certified by receiving the prerequisite training will void the warranty for portions of the subsystems or components that they attempted to service. SERVICE PROVIDER will keep a list of all certified, trained technicians that have met the training requirements. If new technicians join the DEPARTMENT's staff, they must receive training and certification before working on the system.

Warranty Plan Statement of Works

Depot Repair and Return

SERVICE PROVIDER RESPONSIBILITIES

1. Provide a Return Material Authorization ("RMA") within two business days from the date of receipt of' DEPARTMENT request.

2. Depot Repair and Return receipt and inspection.
   - Receive Equipment from DEPARTMENT.
   - Verify against DEPARTMENT submitted RMA.
   - Perform a visual inspection.
   - Perform an operational check to determine if there is a problem and the nature of the problem.
3. Standard Repair
   - Schedule the standard repairs to be made to the Equipment.
   - Make the required repairs and test the functionality of the repaired Equipment.
   - Package, ship, and return the repaired Equipment to DEPARTMENT at SERVICE PROVIDER expense.
   - Provide a Summary Report, per repair as exemplified below, or another format as determined by SERVICE PROVIDER.

Repair Order	Date	Problem	Resolution	Resolution Date
123456	7/4/2017	No card communication.	Corrupt software. Reloaded. Passed communication tests.	7/4/2017

4. Standard Third-Party Original Equipment Manufacturer (“OEM”) Equipment
   - Provide proper method for processing RMA against Third- Party Equipment.
   - Track Equipment sent to the OEM.
   - Provide status updates to DEPARTMENT.
   - Package, ship, and return the repaired Equipment to DEPARTMENT at SERVICE PROVIDER expense.
5. Non-standard Repair

- SERVICE PROVIDER may determine with mutual agreement with the DEPARTMENT, that the repair of Equipment is not within the scope of Services of this SOW due to:
  - Extraordinary physical and other damages.
  - Equipment misuse, mishandling, improper storage, unauthorized Equipment modifications, detrimental exposure, or involvement in an accident (including without limitation liquid intrusions), Acts of God, including, without limitation, lightning damages.
- If the Parties determine, for the reasons set forth above, that the Equipment is not within the scope of Services of this SOW, SERVICE PROVIDER shall either:
  - Determine and provide to DEPARTMENT an estimate of all additional charges required to perform repairs on the Equipment; or
  - Determine and provide to DEPARTMENT an estimate of all additional charges for replacement Equipment.
- If DEPARTMENT approves the additional charges, the repaired or replacement Equipment shall be shipped to DEPARTMENT.
- If DEPARTMENT disapproves the additional charges, SERVICE PROVIDER will charge a Diagnostic Fee of $105 per incident and return the unrepaired Equipment to DEPARTMENT.

6. Schedule
   - Fixed equipment mail-in board repair shall be completed within seven calendar days of receipt. Equipment will be returned to the DEPARTMENT via second-day shipping, with tracking number provided to the DEPARTMENT.
   - Standard Repairs – The time for completion for standard repairs is approximately ten business days from the date of receipt of the Equipment to the date of shipment of the repaired Equipment to DEPARTMENT.
   - Standard Third-Party Original Equipment Manufacturer (“OEM”) Equipment Repairs – The time for completion for standard Third-Party OEM Equipment

repairs is approximately 30 business days from the date of receipt of the Equipment to the date of shipment of the repaired Equipment to DEPARTMENT.

- Non-standard Repairs – Non-standard repairs may take longer than standard repairs. SERVICE PROVIDER will notify DEPARTMENT of any repairs that take longer than ten business days.

7. Return Shipments to DEPARTMENT
   - Equipment shipments shall occur as the individual RMA Equipment is repaired.
   - Multiple Equipment listed on a single RMA shall be shipped together to DEPARTMENT if complete shipment is specifically requested by DEPARTMENT.
   - SERVICE PROVIDER will properly pack outbound shipments and bears the responsibility for damage that occurs prior to delivery to DEPARTMENT.

DEPARTMENT RESPONSIBILITIES

1. Request RMA using SERVICE PROVIDER provided process.
2. Follow the current RMA instructions.
3. Pack Equipment adequately to prevent damages during transit. Equipment damaged in transit will be returned to DEPARTMENT un-repaired and may incur a Diagnostic Fee.
4. Ship, at DEPARTMENT's expense, the Equipment listed in the RMA either to SERVICE PROVIDER' Depot Repair and Return or another mutually agreed facility.
5. If DEPARTMENT wants multiple items listed on a single RMA to be returned together, DEPARTMENT shall request complete shipment.
6. Approve or disapprove additional charges within five business days.
7. Pay a Diagnostic Fee if DEPARTMENT disapproves the additional charges.

Contact SERVICE PROVIDER and arrange for advanced replacement.

Priority Technical Assistance Center (P-TAC)

DESCRIPTION OF SERVICES

1. Priority TAC provides technical telephone support twenty-four (24) hours per day, seven (7) days a week, including holidays via a dedicated telephone number and access to Tech-Link. Knowledgeable and experienced TAC personnel provide support on product operation, programming, maintenance and troubleshooting for SERVICE PROVIDER fixed site equipment, mobiles, and portables. Priority TAC also guarantees a two (2) hour response time if TAC personnel are not readily available to answer the call and a one (1) hour response time for Emergency Calls.

SERVICE PROVIDER RESPONSIBILITIES

1. Provide DEPARTMENT with twenty-four (24) hours per day - seven (7) days a week - three hundred sixty-five (365) days a year technical telephone assistance for resolving problems with their SERVICE PROVIDER fixed site equipment, mobile and portable Subscriber equipment. TAC support personnel will endeavor to respond to calls as quickly as they are received; however, if all support personnel are busy, a call back will be made within one (1) hour from the time the first support request was received.
2. Provide emergency assistance twenty-four (24) hours per day- seven (7) days a week - three hundred sixty-five (365) days a year. TAC support personnel will return all Emergency Calls within one (1) hour.
3. Provide DEPARTMENT with access to Tech-Link. Tech-Link provides access to various on-line support tools via a secure website; DEPARTMENT will receive a user ID and password allowing them access to the secured website. This secure website gives DEPARTMENT 24x7x365 access to technical service memos, the technical library, current software release notes, user documentation and answers to frequently asked questions.
4. If on-site support is required, the TAC personnel will coordinate with the appropriate SERVICE PROVIDER personnel to provide the needed on-site support.

Software FX with SUMS – SERVICE PROVIDER Infrastructure and Subscribers

DESCRIPTION OF SERVICES

SERVICE PROVIDER's Software FX is a comprehensive software maintenance program that provides periodic Software Updates to SERVICE PROVIDER developed software applications and system Security Updates. Software FX is made of three elements. This SOW covers system software release 10A and succeeding versions.

1. The first element provides updates to SERVICE PROVIDER developed software programs. These Software Updates are baseline tested as system level releases and provided as a package to ensure compatibility across system infrastructure, radio components, and programming utilities. The Software Updates include enhancements to the existing software baseline, corrections to issues, and the ability to purchase and enable newly developed licensed features. All software media and revised software manuals are provided at the time of any software revisions, and are available in manual form or on-line through SERVICE PROVIDER's Tech-Link web portal. SERVICE PROVIDER will separate corrective revisions from enhancements; however, if new releases are necessary to provide corrections, then the entire release (including enhancements) shall be provided.
2. The second element, SUMS, for SERVICE PROVIDER Infrastructure only, provides periodic security-related updates to mitigate identified software vulnerabilities. SERVICE PROVIDER monitors governmental and open source information databases to identify vulnerabilities applicable to the Designated System. Updates are tested on dedicated security verification test systems to ensure proper system operation prior to general release. Security Updates may include Microsoft security updates, Sybase, SQL, Red Hat Linux and other security-related updates that are relevant to the Designated System. Security Updates are electronically distributed to target devices via a client - server application running within the designated system. This application provides the full scheduling capabilities should an application restart or server reboot be necessary to complete the update process.
3. The third element, Tech-Link, provides DEPARTMENT access to various on-line support tools via a secure website. DEPARTMENT will receive a user ID and password allowing them access to the secured website. In addition to providing

access to Software Updates, the secure website gives DEPARTMENT 24x7x365 access to technical service memos, the technical library, current software release notes, user documentation and answers to frequently asked questions.

4. All updates shall be shipped to the DEPARTMENT's Software FX contact as designated below, and installed by SERVICE PROVIDER.

SERVICE PROVIDER RESPONSIBILITIES

1. SERVICE PROVIDER will provide DEPARTMENT Software Updates, documentation updates and software release notes.
2. Prior to the general release of a major system release, SERVICE PROVIDER shall make available a system level release document announcing the impending release, and detailing its contents and impact.
3. Provide Security Updates, security release notes, and installation instructions at periodic intervals targeting bi-monthly releases. More frequent Security Update distributions may be required to address urgent product security vulnerabilities. Security Update distributions on other than a bi-monthly basis does not constitute a contractual default or breach by SERVICE PROVIDER.
4. Provide method to deliver Security Updates to the target devices within the DEPARTMENT's Designated System via an automated client - server distribution application.
5. Monitor pertinent governmental, vendor, independent and open source databases for security vulnerabilities and any subsequent resolutions that affect products provided by SERVICE PROVIDER that are part of the DEPARTMENT's Designated System.
6. Identify and document latest system vulnerabilities and compliance issues discovered. Provide a status and recommendations report via Tech-Link.
7. Pretest the Security Updates to ensure that they do not adversely affect SERVICE PROVIDER' stated performance of the DEPARTMENT's Designated System. Testing is performed on dedicated security verification test systems to ensure proper operation prior to general release.
8. Reassess the system configuration annually and provide revised pricing should any significant changes be made to DEPARTMENT's Designated System(s)

configuration. Unless otherwise identified in this SOW, revised pricing will be reflected in the following year's Software FX fee. If SERVICE PROVIDER's rates for Software FX should increase, the DEPARTMENT will be notified in writing of any such increases at least 120 days prior to the end of Subscriber's yearly Software FX period then in effect.

9. Replace any hardware that is impacted by software updates during the Warranty Period

DEPARTMENT RESPONSIBILITIES

1. Properly install or allow SERVICE PROVIDER to install the Software Updates provided by SERVICE PROVIDER in order of receipt from SERVICE PROVIDER. DEPARTMENT recognizes that software support provided by SERVICE PROVIDER is limited to SERVICE PROVIDER's current and current minus 2 software release levels of software programs.
2. Complete or allow SERVICE PROVIDER to complete the Security Update process on the target devices (e.g. rebooting the target devices) following the instructions accompanying each Security Update distribution.
3. Cooperate with SERVICE PROVIDER and perform all acts that are reasonable or necessary to enable SERVICE PROVIDER to provide the services in this SOW to DEPARTMENT.
4. Designate a contact individual(s) or group(s) with sufficient technical expertise to be able to interact knowledgeably with SERVICE PROVIDER's technical support personnel.
5. Purchase of all necessary software licenses to enable the automated distribution of Security Updates for new and existing devices not previously licensed as part of the original Designated System purchase.
6. DEPARTMENT hereby delegates, grants, and assigns to SERVICE PROVIDER, acting as the DEPARTMENT's agent, all approval rights relating to the selection of vendor patches. All approvals given to Third-Party vendors shall be deemed as being granted by the DEPARTMENT.

7. Provide the below designated contact information. The below designated contact will receive all notices and software and Security Updates provided under this SOW

   Name:

   Email Address:

   Shipping Address:

OTHER CHARGES

1. DEPARTMENT may be required to have currently executed service(s)/support agreement(s) with Third-Party vendor(s) separate from this SOW to receive certain Security Updates. Failure to do so may limit the DEPARTMENT's right to receive the Third-Party software.

EXCLUSIONS

1. Any Software products released by SERVICE PROVIDER for which an earlier generation or release level of software is not already contained within DEPARTMENT's Designated System is not included in this SOW.

Software Maintenance – Tait Infrastructure and Subscribers

DEPARTMENT IS ENTITLED TO RECEIVE

1. Software and firmware releases relevant to and within the licensed feature set of Equipment.
2. Access to the Software releases referred to in this SOW shall be through PSPC Info Center or via email PSPC_TAC@Harris.com.
3. SERVICE PROVIDER will provide technical support described in this SOW for the current and up to three previous releases of Software and firmware. Technical support for previous software releases is at SERVICE PROVIDER's discretion and may require additional payment by DEPARTMENT.
4. SERVICE PROVIDER shall maintain only the current Software release for Tait Equipment. If DEPARTMENT has a problem with a non-current release of Software, DEPARTMENT may be required to install, at DEPARTMENT's expense, the most current version of Software to remedy such problem.
5. This SOW does not include the provision of DEPARTMENT requested enhancements, modifications, or developments. Any such enhancement, modification or development may be requested by DEPARTMENT, for an additional fee, via the Help Desk, for consideration by SERVICE PROVIDER.

Software FX with SUMS and Tait Software Maintenance Installation

SERVICE PROVIDER RESPONSIBILITIES

1. Provide DEPARTMENT with a Business Hours installation schedule and approximate Equipment outage times (if applicable).
2. Install Software FX and SUMS updates and Tait Software Maintenance updates.
3. Provide DEPARTMENT with a Summary Report as part of a monthly reporting cycle as exemplified below, or another format as determined by SERVICE PROVIDER:

WO No.	Date	Problem	Resolution	Resolution Date
123456	7/4/2017	Software FX received.	Loaded new Software per release notes.	7/4/2017

4. Provide software update for all SERVICE PROVIDER and Tait Infrastructure, Dispatch and User Radio equipment to the same and latest software release prior to the end of Warranty.

DEPARTMENT RESPONSIBILITIES

1. Decide whether to install or not install Software Updates based on the risks and benefits involved, and waive all SERVICE PROVIDER liability for such decision.
2. Provide a suitable service environment (HVAC, power, illumination, grounding, internet access if applicable).
3. Provide SERVICE PROVIDER unlimited, safe, physical, and remote access to DEPARTMENT sites and Equipment to support delivery of Services.
4. Notify SERVICE PROVIDER when there is any activity that impacts the system, Equipment, or Services.
5. Provide SERVICE PROVIDER instant and easy access to all Equipment, data, and power points.
6. Provide Subscriber equipment collected in at several, mutually agreed, central points.

7. Ensure SERVICE PROVIDER can perform Services in one continuous effort.
8. Waive Services and reimbursement for Services when access is not provided to SERVICE PROVIDER for scheduled Services or the Software installation is deemed not necessary by SERVICE PROVIDER or SERVICE PROVIDER is unable to provide Services due to DEPARTMENT responsibilities.
9. Pay Demand Services for additional efforts including, delays in work, non-SERVICE PROVIDER Software or cable interface acquisition, configuration or engineering services, or repairs.
10. Cooperate with SERVICE PROVIDER and perform all efforts that are necessary to enable SERVICE PROVIDER to provide the Services to DEPARTMENT.

EXCLUSIONS

1. No Software Installation will be provided on Equipment unless targeted by the SERVICE PROVIDER Software FX Software Update or Tait Software Maintenance update.

Issue Resolution Support

INTRODUCTION

This SOW describes the procedure and SERVICE PROVIDER's involvement to address periodic system issues as they arise during the Warranty period. To facilitate understanding, flow charts will be utilized for each step of escalation.

STEP 1: First Echelon DEPARTMENT Support

The first step in exploring an issue is for the DEPARTMENT to attempt to correct an issue on their own (i.e. First Echelon support). The DEPARTMENT will attempt to resolve the issue remotely with their own staff. If not correctable remotely, the DEPARTMENT will dispatch a DEPARTMENT technician to go to the location and work with the remote DEPARTMENT in an attempt to resolve the issue.

Figure 3 – First Echelon Support Flow provides a visual of the process flow for First Echelon support.

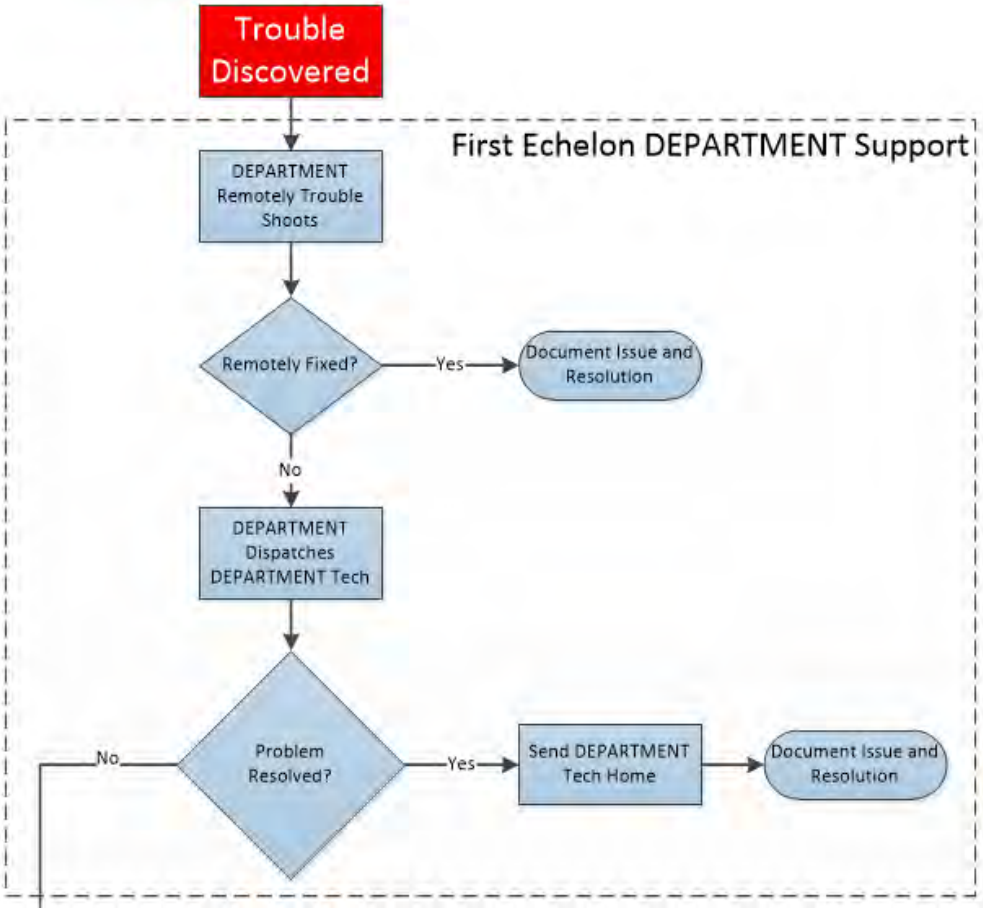
SERVICE PROVIDER Responsibilities:

- None

DEPARTMENT Responsibilities:

- Provide technical personnel and networked based computing resources that can remotely examine system performance.
- Provide technical personnel that can troubleshoot issues at a site.
- Provide computers, networking equipment and calibrated test equipment to DEPARTMENT staff that will adequately allow the staff to troubleshoot issues.
- Maintain adequate spares to support quick issue resolution.
- Log each ticket in the AMPS system or similar platform.

Figure 3. First Echelon Support Flow



STEP 2: SERVICE PROVIDER Level 1 (L1) Support

The second step in the process is initiated if DEPARTMENT team cannot solve the issue remotely or with a DEPARTMENT technician on site.

DEPARTMENT would then call an answering service who would attempt to call the on-call technician. If the on-call technician does not reply within 15 minutes of DEPARTMENT's call to the answering service, the answering service will continue to call the on-call tech plus call the Western Regional Service Manager. If neither reply within 25 minutes of DEPARTMENT's call to the answering service, the answering service will call the Director of Field Services. This is the Escalation Plan that will be followed to ensure the DEPARTMENT receives a call back acknowledging receipt of an issue reported within 30 minutes of DEPARTMENT contacting the answering service. The requirement is for a SERVICE PROVIDER person to call the DEPARTMENT back within 30 minutes acknowledging awareness of the issue.

The support structure is identified below in the flow chart as "Nevada 24x7". Nevada 24x7 is a group of in-state personnel that will support the DEPARTMENTs in their efforts to trouble shoot issues. The Wester Regional Service Manager and his direct staff and indirect channel partners will provide the second line of defense for system issues that arise.

The process flow for L2 support is shown in **Figure 2 – L1 Support Flow.**

The Escalation Plan:

- Step 1
  - DEPARTMENT's single point of contact or on-call personnel will call a defined local number for an answering service. The answering service will take DEPARTMENT's name, number and reason for the call. The answering service will then attempt to contact the SERVICE PROVIDER on-call technician.
- Step 2
  - If after fifteen (15) minutes of DEPARTMENT's call to the answering service the SERVICE PROVIDER on-call technician has not responded to the answering service and DEPARTMENT, the answering service will continue to call the SERVICE PROVIDER on-call technician plus the Regional Service Manager.
- Step 3

- If after twenty-five (25) minutes of DEPARTMENT's call to the answering service neither the SERVICE PROVIDER on-call technician or the Regional Service Manager have responded to the answering service and DEPARTMENT, the answering service will call the SERVICE PROVIDER's Director of Field Services.

- Step 4
  - If SERVICE PROVIDER does not reply to the answering service within 30 minutes, answering service will call DEPARTMENT with a status update and continue to call all three levels of SERVICE PROVIDER escalation.
  -

For L1 support, SERVICE PROVIDER will also attempt to remotely diagnose the issue along with the DEPARTMENT remote support person and on-site DEPARTMENT technician.

If SERVICE PROVIDER L1 remote person cannot assist in the resolution, the next step in the L1 process is for the SERVICE PROVIDER remote person to contact SERVICE PROVIDER' PTAC group for assistance.

If SERVICE PROVIDER L1 remote person, PTAC, DEPARTMENT remote person and DEPARTMENT on site technician cannot resolve the issue, the issue is escalated to Level 2 (L2). The Regional Service Manager will be responsible for driving the actions to resolve the issue.

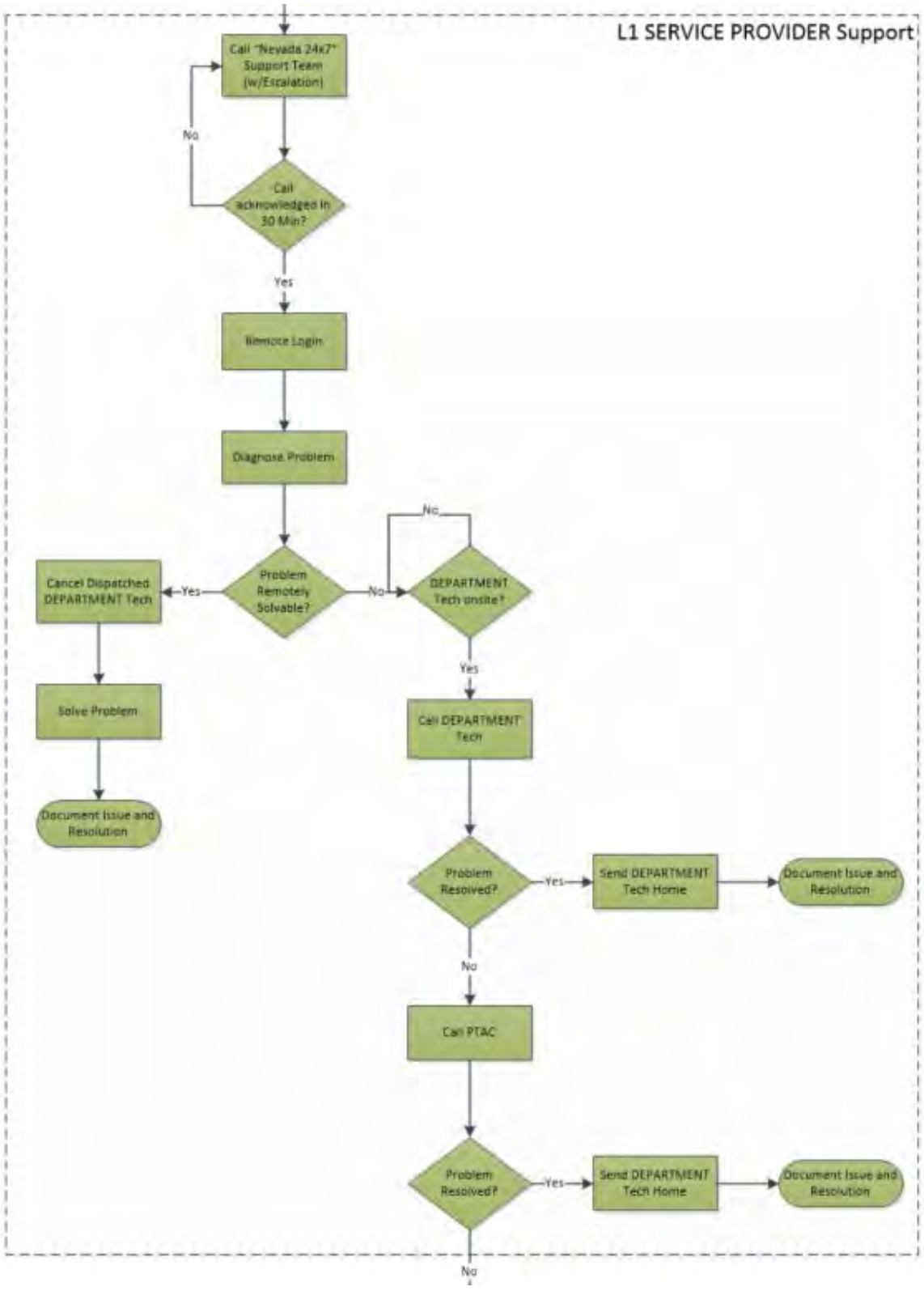
SERVICE PROVIDER Responsibilities:

- Provide qualified technical people to be on-call 24x7 that meet DEPARTMENT access policies.
- Provide the tools and equipment to the SERVICE PROVIDER staff for being able to remotely diagnose
- Provide PTAC assistance (separate service/SOW that is being procured by the DEPARTMENTs).

DEPARTMENT Responsibilities:

- Provide remote access to the NSRS systems for approved SERVICE PROVIDER staff.
- Provide technical personnel and networked computing resources that can remotely examine system performance
- Provide technical personnel that can troubleshoot issues at a site
- Provide computers, networking equipment and calibrated test equipment to DEPARTMENT staff that will adequately allow the staff to troubleshoot issues.
- Maintain adequate spares to support quick issue resolution.
- Ensure DEPARTMENT technician will remain on site throughout the duration of resolution

Figure 4. L1 Support Flow



STEP 3: SERVICE PROVIDER Level 2 (L2) Support

The third step in the process is initiated if the First Echelon and L1 support are unsuccessful in solving the issue.

If the issue is escalated to L2, the first step in the process is to conduct a Joint Action Plan meeting between DEPARTMENT and SERVICE PROVIDER. The goal of the meeting is to coordinate efforts, determine if a SERVICE PROVIDER direct staff technician or SERVICE PROVIDER indirect channel partner technician should be dispatched and to determine severity of the issue. The Regional Service Manager will be responsible for driving the actions from the Joint Action meeting.

If the decision is made to dispatch a SERVICE PROVIDER technician, the timing and logistics of getting SERVICE PROVIDER technician on site to join the DEPARTMENT technician will be mutually agreed upon. The goal for easily accessible sites with a Critical Service issue will be 8 hours. For remote and special vehicle access sites, best effort will be utilized with the goal of having the SERVICE PROVIDER technician on site within 24 hours. SERVICE PROVIDER and the DEPARTMENT will mutually agree on the best method and timing to reach remote sites. will mutually agree on the best method and timing to reach remote sites.

Figure 5 – Critical Service Issues identifies the issues that are deemed “Critical” and require the utmost urgency to resolve and Figure 6 – L2 Support Flow outlines the process flow for L2 support.

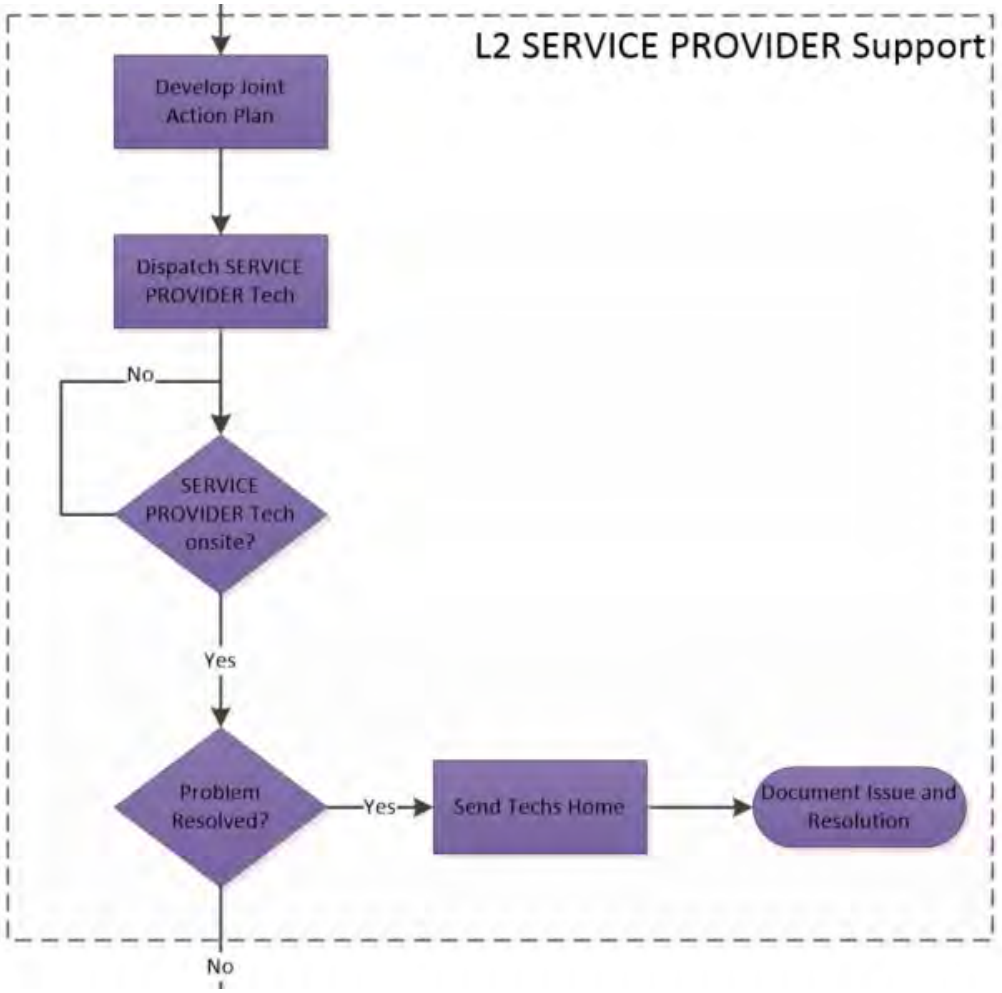
Figure 5. Critical Service Issues

Critical Service Issues
Any failure which causes a loss of 15% or more in capacity or coverage in any cell
Any failure which causes a loss of simulcast capability
Any failure which causes a loss of the primary core
Any system failure that causes the loss of two or more console positions
Any failure that renders the logging recorder inoperable or causes a loss of recorded audio
The failure of two or more repeaters
Concurrent failure of two or more switches and/or routers
Failure of the receiver voting system

Once the technician is on site, five different technical personnel will be attempting to diagnose the issue.

1. DEPARTMENT Remote support
2. SERVICE PROVIDER Remote support
3. P-TAC
4. DEPARTMENT on site technician
5. SERVICE PROVIDER on site technician

Figure 6. L2 Support Flow



SERVICE PROVIDER Responsibilities:

- Provide qualified technical people to be on-call 24x7 that meet DEPARTMENT access policies.
- Provide the tools and equipment to the SERVICE PROVIDER staff for being able to remotely diagnose
- Provide PTAC assistance (separate service/SOW that is being procured by the DEPARTMENT).
- Provide technical personnel that can troubleshoot issues at a site that meet DEPARTMENT access policies.
- Provide computers, networking equipment and calibrated test equipment to SERVICE PROVIDER staff that will adequately allow the staff to troubleshoot issues.
- Ensure SERVICE PROVIDER technician will remain on site throughout the duration of resolution.

DEPARTMENT Responsibilities:

- Provide remote access to the NSRS systems for approved SERVICE PROVIDER staff.
- Provide technical personnel and networked computing resources that can remotely examine system performance
- Provide technical personnel that can troubleshoot issues at a site
- Provide computers, networking equipment and calibrated test equipment to DEPARTMENT staff that will adequately allow the staff to troubleshoot issues.
- Maintain adequate spares to support quick issue resolution.
- Ensure DEPARTMENT technician will remain on site throughout the duration of resolution

STEP 4: SERVICE PROVIDER Level 3 (L3) Support

The fourth step in the process is initiated if the First Echelon support, L1 support and L2 support are unsuccessful in solving the issue.

If the issue is escalated to L3, the first step in the process is to conduct a Joint Action Plan meeting between DEPARTMENT and SERVICE PROVIDER. The goal of the meeting is to coordinate efforts, determine if a SERVICE PROVIDER engineer should be dispatched. The Regional Service Manager will be responsible for driving the actions from the Joint Action meeting.

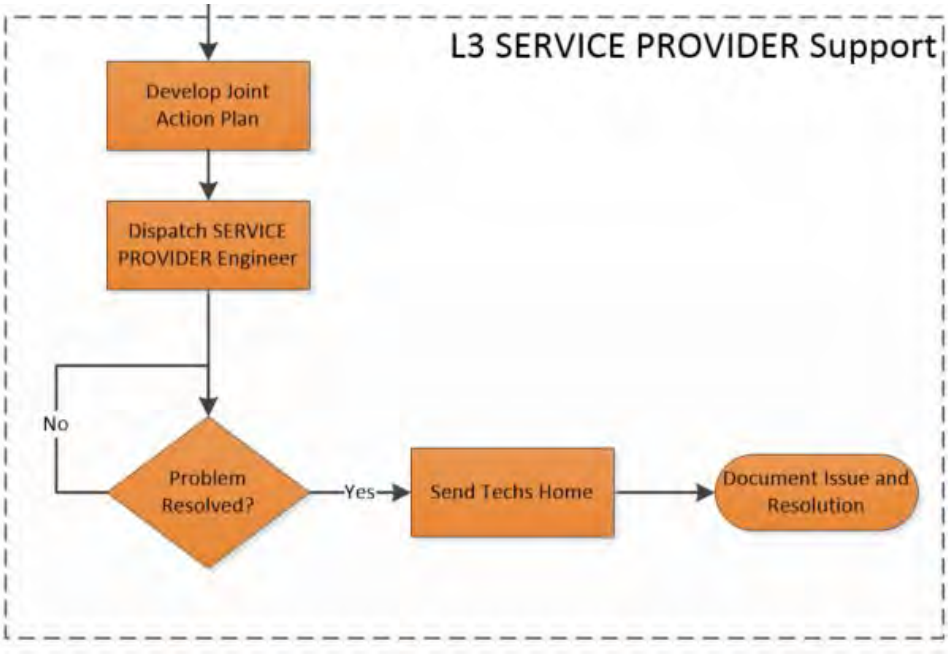
If the decision is made to dispatch a SERVICE PROVIDER engineer, the timing and logistics of getting the SERVICE PROVIDER engineer on site to join the DEPARTMENT technician and SERVICE PROVIDER technician will be mutually agreed upon. The goal for easily accessible sites with a Critical Service issue will be 8 hours. For remote and special vehicle access sites, best effort will be utilized with the goal of having the SERVICE PROVIDER engineer on site within 24 hours. SERVICE PROVIDER and the DEPARTMENT will mutually agree on the best method and timing to reach remote sites.

Figure 7 – L3 Support Flow outlines the process flow for L3 support. Notice that the issue will remain at L3 status until resolved.

Once the SERVICE PROVIDER engineer is on site, six different technical personnel will be attempting to diagnose the issue.

1. DEPARTMENT Remote support
2. SERVICE PROVIDER Remote support
3. P-TAC
4. DEPARTMENT on site technician
5. SERVICE PROVIDER on site technician
6. SERVICE PROVIDER on site engineer

Figure 7. L3 Support Flow



SERVICE PROVIDER Responsibilities:

- Provide qualified technical people to be on-call 24x7 that meet DEPARTMENT access policies.
- Provide the tools and equipment to the SERVICE PROVIDER staff for being able to remotely diagnose
- Provide PTAC assistance (separate service/SOW that is being procured by the DEPARTMENT).
- Provide technical personnel that can troubleshoot issues at a site that meet DEPARTMENT access policies.
- Provide computers, networking equipment and calibrated test equipment to SERVICE PROVIDER staff that will adequately allow the staff to troubleshoot issues.
- Ensure SERVICE PROVIDER technician and engineer will remain on site throughout the duration of resolution.

DEPARTMENT Responsibilities:

- Provide remote access to the NSRS systems for approved SERVICE PROVIDER staff.
- Provide technical personnel and network based computing resources that can remotely examine system performance
- Provide technical personnel that can troubleshoot issues at a site
- Provide computers, networking equipment and calibrated test equipment to DEPARTMENT staff that will adequately allow the staff to troubleshoot issues.
- Maintain adequate spares to support quick issue resolution.
- Ensure DEPARTMENT technician will remain on site throughout the duration of resolution

REPORT GENERATION

If the issue is resolved by the DEPARTMENT First Echelon team, the DEPARTMENT will be responsible for generating the issue resolution report.

If the issue is resolved by SERVICE PROVIDER at the L1, L2 or L3 levels of support, SERVICE PROVIDER will be responsible for generating the issue resolution report.
SERVICE PROVIDER and the DEPARTMENT will mutually agree on the format of the issue resolution report but, at a minimum, it must include:

- Time issue was reported
- Location were issue is being observed
- Symptoms of the issue
- Information regarding Group ID, Unit ID and functionality impacted.
- Time to resolve issue
- Disposition of issue
- Date of issue closure

- Corrective Action if applicable

SPARE PART CONTROL

The DEPARTMENT will be responsible for Spare Part Control including replenishment and usage reporting.

DEPARTMENTDEPARTMENTDEPARTMENTDEPARTMENT

ADDITIONAL CONDITIONS REGARDING SITE ACCESS AND RESPONSE TIMES

1. The goal for easily accessible sites with a Critical Service issue will be 8 hours. For remote and special vehicle access sites, best effort will be utilized with the goal of having the SERVICE PROVIDER engineer on site within 24 hours. SERVICE PROVIDER and the DEPARTMENT will mutually agree on the best method and timing to reach remote sites.
2. DEPARTMENT is responsible to ensure that all necessary clearances, escorts, ID cards, network access requirements including custom software or security credentials, or other special requirements have been provided to SERVICE PROVIDER in advance to allow technicians and engineers prompt access to any Equipment requiring service that may be located in a secured or limited access area under DEPARTMENT’s control.
3. DEPARTMENT agrees to provide SERVICE PROVIDER an appropriate work environment and unlimited access, working space including heat, light ventilation, electric current and outlets, and local wireless, telephone access or networking port for the use of SERVICE PROVIDER' service personnel in the Equipment's physical location if reasonably possible.
4. DEPARTMENT agrees to setup a communications coordination talk group on the system for troubleshooting purposes in support of this Issue Resolution plan primarily for use at remote sites.

Preventive Maintenance on SERVICE PROVIDER Infrastructure and Tait Infrastructure

SERVICE PROVIDER RESPONSIBILITIES

1. Perform Preventive Maintenance which provides tests, checks, and alignment DEPARTMENT's Equipment to ensure the Equipment meets specifications. 's Equipment to ensure the Equipment meets specifications.
2. At DEPARTMENT's request, at Demand Services rates, perform services for work other than tests, checks, and alignment.
3. Provide DEPARTMENT with a Preventive Maintenance Work Hours schedule and approximate Equipment outage times (if any).
4. Provide optimization of Equipment to SERVICE PROVIDER' best practices or third party best practices as applicable.
5. Provide DEPARTMENT with a Summary Report as part of a monthly reporting cycle as exemplified by Preventive Maintenance SERVICE PROVIDER Infrastructure Table, or another format as determined by SERVICE PROVIDER.
6. If spares are consumed during a Preventative Maintenance, include the model and serial number of both the defective unit and the spare in the Summary Report.

DEPARTMENT RESPONSIBILITIES

1. Provide a suitable service environment (HVAC, power, illumination, grounding, internet access if applicable).
2. Provide SERVICE PROVIDER unlimited, safe, physical and remote access to DEPARTMENT sites and equipment to support delivery of Service.
3. Notify SERVICE PROVIDER when there is any activity that impacts the system, Equipment, or Services.
4. Provide SERVICE PROVIDER instant and easy access to all Equipment, data, and power points.
5. Ensure SERVICE PROVIDER can perform Services in one continuous effort.

6. Waive Services and reimbursement for Services when access is not provided to SERVICE PROVIDER for scheduled Services or SERVICE PROVIDER is unable to provide Services due to DEPARTMENT responsibilities.
7. Pay Demand Services for additional efforts including Equipment removal, Equipment aggregation management, delays in work, repairs or replacement.
8. Cooperate with SERVICE PROVIDER and perform all efforts that are necessary to enable SERVICE PROVIDER to provide the Services to DEPARTMENT.
9. Review Summary Report, and within 30 days of receipt, provide direction for further action.

ADDITIONAL CONDITIONS

1. DEPARTMENT is responsible to ensure that all necessary clearances, escorts, ID cards, network access requirements including custom software or security credentials, or other special requirements have been provided to SERVICE PROVIDER in advance to allow technicians prompt access to any Equipment requiring service that may be located in a secured or limited access area under DEPARTMENT's control.
2. DEPARTMENT shall be billed at Demand Services rates for time lost or changes due DEPARTMENT in the provision or execution of the Services. in the provision or execution of the Services.

PREVENTATIVE MAINTENANCE CHECKLIST

Figure 8 provides Services to be performed as applicable during the Preventive Maintenance Exhibit 5 – Equipment List. The technician will attempt to bring the equipment into specification, if necessary. If repairs are required and authorized by the DEPARTMENT, a separate work order will be created and noted in the actions., a separate work order will be created and noted in the actions.

Figure 8. Preventive Maintenance Checklist

Technician _____ **Date** _____

SERVICE PROVIDER Infrastructure Equipment	Preventive Maintenance (If Applicable & as Necessary)	Period	Pass Fail	Notes or Recommended Actions to Take
GENERAL	Check RF, data and audio cable condition	Once per year during the Warranty term		
	Check general alarm status, troubleshoot and investigate any found alarm conditions	Once per year during the Warranty term		
	Check condition of punch blocks	Once per year during the Warranty term		
	Perform a general talkgroup test	Once per year during the Warranty term		
	Perform a multisite test	Once per year during the Warranty term		
	Perform an individual call test	Once per year during the Warranty term		

SERVICE PROVIDER Infrastructure Equipment	Preventive Maintenance (If Applicable & as Necessary)	Period	Pass Fail	Notes or Recommended Actions to Take
MASTR V BASE STATION (Manual MM-017079-001)	Check simulcast timing, adjust, if needed	Once per year during the Warranty term		
MASTR V	Check transmitter RF power output per design specifications	Once per year during the Warranty term		
MASTR V	Check transmitter frequency stability is within specification	Once per year during the Warranty term		
MASTR V	Check modulation deviation is within specification	Once per year during the Warranty term		
Receive Multicoupler and connections to RX	Check Receiver sensitivity and BER	Once per year during the Warranty term		
Network Alarm Equipment	Verify alarm functionality	Once per year during the Warranty term		
System	Check call processing, each working (voice) channel	Once per year during the Warranty term		
All equipment including network equipment	Clean physical filters clean or replace, as needed	Once per year during the Warranty term		

SERVICE PROVIDER Infrastructure Equipment	Preventive Maintenance (If Applicable & as Necessary)	Period	Pass Fail	Notes or Recommended Actions to Take
Antenna System	Inspect and sweep RF TX and RX antenna cables. Inspect RF cable, connectors and suppressor in the shelter. lines	Once per year during the Warranty term		
Network and Console Equipment	Inspect audio and data cables for snug connection and corrosion	Once per year during the Warranty term		
Site/system	Verify control channel operation and rolling	Once per year during the Warranty term		
Site Equipment	Perform power supply voltage checks	Once per year during the Warranty term		
CONVENTIONAL RADIO BASE STATION	Check transmitter RF power output doesn't exceed design specifications	Once per year during the Warranty term		
Tait 800/VHF	Check transmitter frequency stability is within specification	Once per year during the Warranty term		

SERVICE PROVIDER Infrastructure Equipment	Preventive Maintenance (If Applicable & as Necessary)	Period	Pass Fail	Notes or Recommended Actions to Take
Tait 800/VHF	Check modulation deviation is within specification on VHF and 800	Once per year during the Warranty term		
Tait 800/VHF	Check Receiver sensitivity	Once per year during the Warranty term		
Tait 800/VHF	Verify alarm functionality	Once per year during the Warranty term		
Tait 800/VHF	Perform voice call processing, each 800 and VHF channel	Once per year during the Warranty term		
Tait 800/VHF and Network Equipment	Clean or replace physical filters	Once per year during the Warranty term		
Tait 800/VHF	Inspect and sweep RF, TX, and RX antenna cables. Inspect RF cable, connectors and suppressor in the shelter.	Once per year during the Warranty term		

SERVICE PROVIDER Infrastructure Equipment	Preventive Maintenance (If Applicable & as Necessary)	Period	Pass Fail	Notes or Recommended Actions to Take
Tait 800/VHF	Inspect audio and data cables for snug connection and corrosion	Once per year during the Warranty term		
Tait 800/VHF	Perform power supply voltage checks			
GPS RECEIVERS	Verify GPS sync	Once per year during the Warranty term		
	Verify alarm functionality	Once per year during the Warranty term		
	Verify battery functionality	Once per year during the Warranty term		
	Check power supply voltage	Once per year during the Warranty term		
NETWORK	Check and verify RNM alarms	Once per year during the Warranty term		

SERVICE PROVIDER Infrastructure Equipment	Preventive Maintenance (If Applicable & as Necessary)	Period	Pass Fail	Notes or Recommended Actions to Take
	Inspect Ethernet cables	Once per year during the Warranty term		
	Check MPLS router voltage	Once per year during the Warranty term		
	Check MPLS router cables	Once per year during the Warranty term		
	Check MPLS router alarms	Once per year during the Warranty term		
	Check dual CPU operation	Once per year during the Warranty term		
	Check servers for dust; clean and replace filter, as necessary	Once per year during the Warranty term		
CONSOLE ACCESSORIES	Check microphone, headset jacks, foot switches for condition and functionality	Once per year during the Warranty term		

SERVICE PROVIDER Infrastructure Equipment	Preventive Maintenance (If Applicable & as Necessary)	Period	Pass Fail	Notes or Recommended Actions to Take
CALL DIRECTOR	Check functionality	Once per year during the Warranty term		
ISSI	Coordinate with DEPARTMENT for outside agencies and check functionality	Once per year during the Warranty term		
	Check for alarms	Once per year during the Warranty term		
NSS	Verify high availability (HA) functionality	Once per year during the Warranty term		
	Check for alarms	Once per year during the Warranty term		
	Check servers for dust	Once per year during the Warranty term		

SERVICE PROVIDER Infrastructure Equipment	Preventive Maintenance (If Applicable & as Necessary)	Period	Pass Fail	Notes or Recommended Actions to Take
	Check servers are operating on most current software revision	Once per year during the Warranty term		
	Check BeOn functionality	Once per year during the Warranty term		
SYMPHONY CONSOLES	Check for system connectivity	Once per year during the Warranty term		
	Verify console basic call functionality. Perform voice calls on talk groups	Once per year during the Warranty term		
	Check select and unselect speaker audio output for clarity	Once per year during the Warranty term		
	Check microphone, headset jacks, foot switches for condition and functionality	Once per year during the Warranty term		

Warranty Plan Definitions

BUSINESS HOURS. Business Hours are defined as 8:00 a.m. to 5:00 p.m. PST, Monday through Friday excluding, national, state, and local holidays.

DEPARTMENT. Means “Buyer”, the end-user entity, named in the Agreement, purchasing Services for its own internal use under this Warranty Plan.

DEMAND SERVICES. Means service requests beyond the scope of and not defined in this Warranty Plan. Demand Services may be performed at SERVICE PROVIDER’ rates plus any other applicable expenses, fees, and escalations, as determined by SERVICE PROVIDER. The installation, removal, reinstallation, and/or replacement of equipment not associated with the Services as defined in this Warranty Plan shall be considered Demand Services or Other Services, as applicable. SERVICE PROVIDER has the right to reasonably refuse to provide Demand Services or Other Services. Demand Services may include work performed outside of Business Hours and Other Services, as applicable. Demand Services may be escalated yearly.

DESIGNATED SYSTEM(S). Means the SERVICE PROVIDER system(s) purchased by DEPARTMENT and identified in Equipment List for the Software FX SOW. The Designated System does not include Third Party Software products, excluded products or other systems to which the Designated System may be linked.

DIAGNOSTIC FEE. Means the fee that is charged if DEPARTMENT disapproves charges to repair and/or replace Equipment upon SERVICE PROVIDER’ determination for repair or replacement of Equipment, as per applicable SOW. SERVICE PROVIDER will charge DEPARTMENT a Diagnostic Fee based on the repair facility used and return the unrepaired Equipment to DEPARTMENT.

EQUIPMENT. Means the products and related systems, as identified in the Equipment List for which Services are to be provided under and as set forth in this Warranty Plan.

EQUIPMENT LIST. Means the specific, serialized list of Equipment for Services to be provided under and is set forth in this Warranty Plan.

INFRASTRUCTURE. Means the i) Radio Frequency (RF) site (consisting of only a duplexer, combiner, multicoupler, channels, Internet Protocol (IP) channel routers with interface cards, network sentry, Unified Audio Card (UAC), and Mini-Mobility Exchange (MME); ii) the dispatch site (consisting of only IP consoles, IP console switches, IP console routers, IP console internal interface cards, and IP console power supplies; or iii) an Network Switching Center (NSC) site (consisting of only the NSC IP server, storage array, IP router, backup device, firewall, fault management data collection device, and network management pc interface). Infrastructure and respective quantities are specifically itemized in the Equipment List.

NON-SERVICE PROVIDER INFRASTRUCTURE. Means the Equipment not part of Infrastructure or Subscribers. Non SERVICE PROVIDER Infrastructure may comprise of the following: microwave or data transport system components (such as microwave, fiber, multiplexors, and routers), logging recorder timing receiving or generation systems, towers, tower top amplifiers, shelters, fences, landscaping, dehydrators, fuel tanks, bi-directional amplifiers (BDAs), alternating or direct current power systems (uninterruptible power supply (UPS), monitors, inverters, converters, generators, or feeds), heating ventilation air conditioning (HVAC), fire suppression, and/or other environmental monitoring or affecting systems. Non-SERVICE PROVIDER Infrastructure and respective quantities are specifically itemized in the Equipment List.

NON-SERVICE PROVIDER SOFTWARE. Means software whose copyright is owned by a party other than SERVICE PROVIDER or its affiliated companies, including but not limited to the applications, anti-virus updates, operating system patches, and signature files.

OTHER SERVICES. Means Demand Services as requested by DEPARTMENT that entail subcontractors, Third Parties, or non-SERVICE PROVIDER services on a time and material basis plus 35%. SERVICE PROVIDER has the right to reasonably refuse to provide Other Services. Other Services may include work performed outside of Business Hours and Demand Services, as applicable.

PREVENTIVE MAINTENANCE. Means tests, checks, and alignment on DEPARTMENT's Equipment to ensure that the Equipment meets the specifications of each Equipment's manual.

RESPONSE TIMES. Means the expected timeframe to respond to an unscheduled system problem or outage event as described in the applicable SOW. Response Times are based on the assumption that the site is accessible by normal transportation methods and vehicles. On-site Response Time requirements exclude site locations that require extensive drive time due to traffic conditions, obstructions, distances, or site locations where specialized vehicles are required**.**

SECURITY UPDATES. Means Software Updates, as stated in the Software FX SOW to the Designated System, that mitigate, address and/or resolve product security vulnerabilities in system components offered by SERVICE PROVIDER, including but not limited to, operating system updates, antivirus signatures, and other security related Windows-based third-party updates (Microsoft security patches, Red Hat Linux security patches, and vulnerability updates for third party products). Security Updates may include Non-SERVICE PROVIDER software patches and/or a work-around.

SECURITY UPDATE MANAGEMENT SERVICE ("SUMS"). Means SERVICE PROVIDER' automated patch management system that provides periodic, security-related Software Updates as stated in the Software FX SOW to the Designated System.

SOFTWARE UPDATES. Means SERVICE PROVIDER provided Software Updates to either SERVICE PROVIDER Designated System components or Security Updates. Updates may contain modifications, enhancements, and/or corrections to existing features, as determined solely by SERVICE PROVIDER. Software Updates means commercially available corrections, modifications, or minor enhancements to the licensed programs generally released and/or provided by SERVICE PROVIDER.

SOFTWARE UPGRADES. Means a major release that replaces the current version of software and provides new features and/or functionality.

SPARE PART(S). Means required additional Equipment to be purchased by DEPARTMENT for use to complete repairs of Equipment. Should DEPARTMENT not purchase Spare Parts, SERVICE PROVIDER shall not be responsible to provide the Services under the SOWs, in this Warranty Plan that are dependent upon Spare Parts being purchased by DEPARTMENT.

SUBSCRIBERS. Means mobile radios, portable radios, control stations, vehicle repeaters, modems, routers, Wi-Fi devices, tablets, or back up dispatch radios that consist of mobile or portable radios as their prime radio transmitter, as listed in the Equipment List.

SUMMARY REPORT. Means communication to indicate action taken in a report to be provided to DEPARTMENT within the frequency and intervals, and as exemplified, under the applicable SOW for Services.

TECH-LINK. Means SERVICE PROVIDER' secure web portal containing on-line support tools offered to DEPARTMENT as part of the applicable SOW. Access is restricted to authorized DEPARTMENTs via user ID and password login.

THIRD PARTY (IES). Means any entity other than SERVICE PROVIDER that provides products or services to DEPARTMENT, whether managed by or processed through SERVICE PROVIDER.

Training

Overview

The Training Plan for the Nevada Department of Transportation (NDOT) encompasses *Technical and System Management Training*, *Dispatch Equipment Training*, and *User Radio Equipment Training*. NDOT will receive the training syllabus for approval 1-month prior to scheduling any training class. Participants will receive and own hard- and soft-copies of the training materials used in class. Additionally, NDOT may video the training classes for future purposes.

Technical and System Management Training

Technical and System Management Training is comprised of multiple training courses on System Administration, Radio Infrastructure, and Radio Subscribers so that NDOT can manage, configure and maintain the NSRS. All traditional classroom training will be conducted in Las Vegas and Reno at facilities provided by an NSRS Member on mutually agreeable dates and at the appropriate time during system implementation. Each course will be conducted three times for up to 12 students per session and will be jointly attended by all three Members.

System Administration Training

System Administration Training will be conducted for technical personnel responsible for defining the fleet map and associated properties, planning radio feature usage and personalities, developing operating procedures, maintaining unit and group databases, generating reports, controlling radios (e.g., enabling and disabling units), and monitoring system performance. Figure 1 defines the training program on system administration.

Figure 1. The System Administration Training Program

Course Name	Length	No. of Times Delivered	Total No. of NDOT Students
		3	16
P25 System Overview	Five 4-hour sessions		

Course Name	Length	No. of Times Delivered	Total No. of NDOT Students
P25 Fleet Mapping Workshop	3 days	3	16
Unified Administration System	2 days	3	16
Regional Network Manager	2 days	3	16
Over-the-Air Rekeying	1 day	3	16
Radio Programming & OTAP	1 day	3	16
ISSI Configuration & Admin.	1 day	3	16

The *P25 System Overview Course* will be delivered using a virtual classroom setting and is limited to four hours each day.

Participants in the System Administration Training Program will receive unlimited access to the following self-paced, web-based training courses for one year beginning the week participants attend the *P25 System Overview* virtual classroom course.

- P25 Fleet Mapping Overview
- Radio Operation
- Symphony Console Operation
- Radio Programming Overview
- Advanced Access Control
- Active Directory
- Activity Warehouse
- Radio Personality Manager (RPM & RPM 2)
- Unified Administration System (UAS) Overview
- Regional Network Manager (RNM) Overview
- Enterprise Network Manager (ENM)
- Over-the-Air Programming (OTAP)
- Over-the-Air Rekeying (OTAR) Fundamentals
- Inter-RF Subsystem Interface (ISSI) Fundamentals

Harris will provide access to the self-paced, web-based training for system administrators until one year after final system acceptance.

Radio Infrastructure Training

Radio Infrastructure Training provides technicians with the knowledge and skills needed to conduct preventive maintenance, troubleshoot problems, and take corrective action Figure 2 defines the training program on radio system infrastructure.

Figure 2. The Radio Infrastructure Training Program

Course Name	Length	No. of Times Delivered	Total No. of NDOT Students
P25 System Maintenance	7 days	3	16
Regional Network Manager	2 days	3	16
Network Operation & Maintenance	3 days	3	16
MASTR V Station Maintenance	1½ days	3	16
P25 Simulcast System Maintenance	3 days	3	16

Radio Subscriber Training

Radio Subscriber Training will be provided for technical personnel responsible for programming and maintenance of all user radios. Harris will conduct a five-day *RF Maintenance Course* that provides in-depth discussion and hands-on exercises to maintain the Harris XL family of portable and mobile radios. Technicians and engineers will participate in classroom presentations and discussions on radio programming for testing as well as radio personality modification to meet specific needs. Harris will demonstrate and discuss radio disassembly, and identify field replaceable parts and service tools, in addition to covering individual radio field serviceability plans including field replaceable modules and components. Hands-on exercises will include radio programming, testing, and maintenance to the level authorized by the field serviceability plan.

The *RF Maintenance Course* will be conducted three times for up to 12 students per session and will be jointly attended by all three Members. The training will be conducted at a facility provided by the Members at mutually agreeable locations and dates. A total of 16 NDOT personnel will participate.

Dispatch Equipment Training

Dispatch Equipment Training consists of *Console Configuration, Operation & Maintenance Training* for dispatch supervisors and maintenance technicians and *Console Operation Refresher Training* for dispatchers.

Console Configuration, Operation & Maintenance Training

This two-day course will provide designated dispatch supervisors and maintenance technicians with the knowledge and skills to configure the Symphony Dispatch Console to meet operational needs, conduct training for dispatchers, and maintain the console. The training will include a detailed operational overview that introduces the various features and capabilities of the console. Participants will work within the Configuration Utility to explore the various settings and how these settings impact the operation of the console. With an understanding of the Configuration Utility settings, participants will have the requisite knowledge to define the parameters that best suit their operational needs. NDOT will save these settings and use them as a template to set up additional consoles. The remainder of the course involves defining the operating characteristics of the console and using the Configuration Editor to create setups to address the various functions required. This includes adding, renaming and deleting workspace tabs; designing communications modules (i.e., entities, colors, sizes, etc.); adding, deleting and moving communication modules; changing the sidebar panel layout; creating, switching, deleting and password protecting console setups; and setting encryption indicators and controls, if applicable.

The console operational portion of the training will be conducted using a train-the-trainer approach and includes performing tasks such as selecting communication modules; transmitting and receiving group and individual calls; transmitting, receiving and clearing emergency calls; reviewing call history and playing back audio; modifying communication modules; creating, modifying and transmitting on patches and simulselects; controlling conventional channels; using the paging function; changing console setups; and using special and enhanced console features.

Harris will conduct three training sessions in Elko and one training session in Reno. This training will occur approximately two-to-four weeks prior to the start of the performance period. Each training session may have up to six participants.

Console Operation Refresher Training

Harris will provide unlimited access to the web-based *Symphony Console Operation Course* for all NDOT dispatch personnel for one year beginning after completion of the train-the-trainer courses. Web-based training is hosted by Harris Technical University (HTU). Each student will require a unique e-mail address and create a unique username and password. Students will be

able to access transcript information showing course progress and completion status, and print a completion certificate once all course activities are complete.

User Radio Equipment Training

Harris will provide *Radio User Training* based on a train-the-trainer approach. Harris will provide model training and support materials for designated NDOT trainers to use during the implementation phase. Each train-the-trainer session on radio operation is scheduled for one day and includes an overview of the NSRS P25 radio system, a description of system operation including failure modes, a discussion of radio/system coverage expectations, a discussion and demonstration of the differences between analog and digital voice, a demonstration of basic radio operations including proper radio use, hands-on practice with the radios, and a discussion of basic radio care including battery maintenance.

Harris recommends that NDOT select trainers from the departments who will use the radio system. The trainers need to be familiar with current operations and aware of any operational issues. Harris will provide customized presentation materials for the instructors and electronic copies of the training materials to allow for additional customization, if desired.
Harris will conduct two train-the-trainer sessions approximately two-to-four weeks prior to the start of the performance period. Each session is limited to a maximum of 15 participants. This training will use Harris radios purchased as part of the system.

User Radio Operation Refresher Training

Harris will provide unlimited access to standard web-based radio operation courses for all NDOT radio users for one year beginning after completion of the train-the-trainer sessions. Web-based training is hosted by Harris Technical University (HTU). Each student will require a unique e-mail address and create a unique username and password. Harris will train and provide a designated individual with administrative rights to the HTU Learning Management System (LMS). The LMS utilizes a tiered structure so that the administrator can create and modify user accounts, distribute account registration links, manage course access, monitor student activity and progress in completing courses, and generate reports.

ATTACHMENT B

SOFTWARE LICENSE AGREEMENT

This License Agreement ("License Agreement") is made upon the Effective Date of the Primary Agreement (the "Effective Date") between Harris Corporation, a Delaware Corporation, acting through its Communication Systems Segment, ("LICENSOR") with offices at 221 Jefferson Ridge Parkway, Lynchburg, VA 24501, and the State of Nevada, acting by and through its Department of Transportation, 1263 S Stewart Street, Carson City, NV 89712 ("LICENSEE"). LICENSOR is the owner of certain wireless communications software programs and LICENSEE desires to obtain a license from LICENSOR to use such wireless communications programs.

1.0 Definitions.

1.1 "Designated Systems": Means the Harris system(s), products, and Designated Terminals purchased by the DEPARTMENT and identified in the Primary Agreement for which the Licensed Programs and documentation are intended to be used.

1.2 "Designated Terminals": Means the LICENSOR's Terminals purchased by LICENSEE.

1.3 "Licensed Programs": The term Licensed Programs shall mean the wireless communications computer programs in software or firmware supplied under this License Agreement by LICENSOR in binary object code format to the LICENSEE (stand alone or in conjunction with the purchase of a LICENSOR wireless communications system.) Licensed Programs shall also include all other material related to the Licensed Programs supplied by LICENSOR to LICENSEE hereunder, and which may be in machine readable or printed form, including but not limited to user documentation and/or manuals.

1.4 "Open Source Software": Means software with either freely obtainable source code, license for modification, or permission for free distribution.

1.5 "Open Source Software License": The terms or conditions under which the Open Source Software is licensed.

1.6 "Primary Agreement": The agreement to which this exhibit is attached.

1.7 "Third Party Software Products": Shall mean programs that are not developed by LICENSOR which are licensed / purchased by LICENSOR for inclusion in its products.

2.0 License Grant for Licensed Programs.

2.1 Subject to the Contract and the performance by Licensee of its obligations hereunder, LICENSOR hereby grants to Licensee, and Licensee hereby accepts from LICENSOR, (a) a personal, non-transferable, non-exclusive, perpetual, limited license to use the Licensed Programs in object code format only and (b) install and execute such Licensed Programs on Licensee's equipment and (c) are to be used for internal business purposes only. All licensed programs under this License Agreement shall only be used in conjunction with the Designated System. This license does not transfer any right, title, or interest in the Licensed Programs. The license granted authorizes Licensee to use the Licensed Programs in object code format and does not grant any rights to source code.

2.2 LICENSEE will not reproduce, modify, or make derivative works of the Licensed Programs, except that LICENSEE may make one archival, and one inactive backup, copy of the Licensed Programs. In addition, LICENSEE, its agents, consultants and/or its subcontractors will not

attempt to reverse engineer, decompile, or reverse-compile any software contained in the Licensed Programs and any attempt to do so shall be a material breach of this License Agreement. With respect to the Licensed Programs, LICENSEE will not alter, deface, discard, or erase any media, documentation, or LICENSOR or Third Party Licensor's trademarks or proprietary rights notices.

2.3 Third Party Software Products may be subject to additional license terms, which, if applicable, are set out in Product Specific License Terms delivered with each product. To the extent applicable, LICENSEE shall comply with any additional Third Party Software Product license terms.

2.4 If the Software licensed under this License Agreement contains or is derived from Open Source Software, the terms and conditions governing the use of such Open Source Software are in the Open Source Software Licenses of the copyright owner and not this License Agreement and, to the extent applicable, LICENSEE will comply with the Open Source Software License terms. If there is a conflict between the terms and conditions of this License Agreement and the terms and conditions of the Open Source Software Licenses governing Licensee's use of the Open Source Software, the terms and conditions of the license grant of the applicable Open Source Software Licenses will take precedence over the license grants in this License Agreement. If requested by Licensee, Harris will use commercially reasonable efforts to: (i) determine whether any Open Source Software is provided under this License Agreement; (ii) identify the Open Source Software and provide Licensee a copy of the applicable Open Source Software License (or specify where that license may be found).

3.0 Protection and Security of Licensed Programs.

LICENSEE acknowledges and agrees that the Licensed Programs and any materials and/or documentation related thereto, and any portion thereof, supplied by LICENSOR hereunder are proprietary and confidential to LICENSOR or applicable third party licensors and are a valuable commercial asset of LICENSOR or their third party owners. LICENSEE also acknowledges and agrees that LICENSOR and/or the third party licensors have and shall retain all proprietary rights in their respective portions of the Licensed Programs and any materials and/or documentation related thereto. LICENSEE (i) shall respect such proprietary rights, (ii) shall protect LICENSOR and any third party licensor's proprietary rights at least to the extent that it protects its own proprietary information, or such (iii) shall not use the Licensed Programs nor any materials or documentation related thereto except for the purposes for which they are being made available as set forth in this License Agreement and (iv) shall not reproduce, print, disclose, or otherwise make said Licensed Programs or materials and/or documentation related thereto available to any third party, in whole or in part, in whatever form, except as permitted in the terms of this License Agreement.

4.0 Warranty

SERVICE PROVIDER warrants, for the greater of a period of one year or, if a longer warranty period for the product containing the Licensed Program is set forth in a Primary Agreement, the longer warranty period shall apply commencing with the date of Licensee's acceptance of their Designated System, that any Licensed Program furnished to Licensee under this License Agreement shall be capable of successfully operating on the Designated System in accordance with the logic defined in the operator's manuals when the system is supplied with correct input data. If, on the basis of evidence submitted to LICENSOR within the term of this warranty, it is shown that any Licensed Program does not meet this warranty, LICENSOR will, at its option, either correct the defect or error in the Licensed Program, free of charge, or make available to Licensee a substitute program. The foregoing warranty is exclusive and in lieu of all other warranties whether written, oral, implied or statutory. **NO IMPLIED OR STATUTORY WARRANTY**

OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, NONINFRINGEMENT, SHALL APPLY, ALL OF WHICH ARE EXPRESSLY DISCLAIMED BY LICENSOR.

Licensed Programs which have been developed or are owned by a third party licensor and which are sublicensed by LICENSOR to LICENSEE hereunder shall be warranted to LICENSEE only to the extent that the licensor of such sublicensed programs warrants such sublicensed programs to LICENSOR.

In the event that the Licensed Programs do not conform to the representation above, LICENSEE's sole remedy and LICENSOR's sole and exclusive liability shall be to replace such Licensed Programs with the then current released version of such Licensed Programs.

5.0 Limitation of Liability.

5.1 **THE LIMITATION OF LIABILITY PROVISION IN THE PRIMARY AGREEMENT SHALL GOVERN THIS LICENSE AGREEMENT AND SECTION 5.2 SHALL NOT APPLY. IF THERE IS NO LIMITATION OF LIABILITY PROVISION IN THE PRIMARY AGREEMENT, SECTION 5.2 SHALL APPLY.**

5.2 **IN NO EVENT WILL LICENSOR AND/OR ANY THIRD PARTY LICENSOR(S) BE LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL, CONSEQUENTIAL, PUNITIVE OR EXEMPLARY DAMAGES, INCLUDING BUT NOT LIMITED TO ANY DAMAGES RESULTING FROM LOSS OF USE, LOSS OF DATA, LOSS OF PROFITS OR LOSS OF BUSINESS, WHETHER BASED ON CONTRACT, TORT, STRICT LIABILITY OR ANY OTHER THEORY OR FORM OF ACTION, EVEN IF LICENSOR AND/OR ITS THIRD PARTY LICENSOR(S) HAVE BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. LICENSOR'S AND THIRD PARTY LICENSORS' LIABILITY IN CONTRACT, TORT OR OTHERWISE ARISING OUT OF OR IN CONNECTION WITH THIS LICENSE AGREEMENT OR THE USE OF THE LICENSED PROGRAMS SHALL NOT EXCEED THE TOTAL COMPENSATION PAID TO LICENSOR BY LICENSEE FOR THE PRODUCTS CONTAINING THE LICENSED PROGRAMS.**

6.0 Term and Termination.

6.1 LICENSOR reserves the right, in addition to any other remedies it may retain in this License Agreement or may be entitled to in law or equity (including immediate injunctive relief and repossession of all non-embedded Licensed Programs and documentation), to terminate this License Agreement at any time prior to the expiration of any Term in the event LICENSEE breaches any material term or condition or fails to perform or observe any obligations or covenants of this License Agreement and such failure and/or breach is not remedied within thirty (30) calendar days of written notice from LICENSOR.

6.2 Within thirty (30) calendar days after termination or expiration of this License Agreement, LICENSEE will return to LICENSOR all confidential material, including, but not limited to, all copies, partial copies, and/or modified copies (if any) of Licensed Programs and any equipment owned by LICENSOR in LICENSEE's possession.

7.0 Assignment/Transfer.

This License Agreement, the licenses granted hereunder, and the Licensed Programs provided to LICENSEE under this License Agreement may not be assigned, sub-licensed, or otherwise transferred by LICENSEE to any third party without LICENSOR's prior written consent, except that this license may be assigned if the Products containing the Licensed Programs are

transferred, but the new owner or user of the Products may only use the Licensed Programs in accordance with terms of this License Agreement. Subject to the foregoing, any assignee hereunder shall be subject to all of the terms, conditions, and provisions of this License Agreement. Any attempt by LICENSEE to assign, sub-license, or transfer the Licensed Programs, or any of the rights or duties contained in this License Agreement, without LICENSOR's prior written consent shall be void.

8.0 Severability.

If any term or provision of the License Agreement is determined by a court or government agency of competent jurisdiction to be invalid under any applicable statute or rule of law, such provision(s) are, to that extent, deemed omitted, but this License Agreement and the remainder of its provision shall otherwise remain in full force and effect.

9.0 Waiver.

No waiver will be implied from conduct or failure to enforce rights. No waiver will be effective unless in writing signed on behalf of the party against whom the waiver is asserted.

10.0 Compliance with Laws.

Licensee acknowledges that the Licensed Programs are subject to the laws and regulations of the United States, and Licensee will comply with all applicable laws and regulations, including export laws and regulations of the United States. Licensee will not, without the prior authorization of Harris and the appropriate governmental authority of the United States, in any form, export or re-export, sell or resell, ship or reship, or divert, through direct or indirect means, any item or technical data or direct or indirect products sold or otherwise furnished to any person within any territory for which the United States Government or any of its agencies at the time of the action, requires an export license or other governmental approval. Violation of this provision is a material breach of this License Agreement.

11.0 Governing Law.

This License Agreement will be governed by the laws of the Unites States to extent that they apply and otherwise to the laws of the State of Nevada. The terms of the U.N. Convention on Contracts for the International Sale of Goods do not apply. The parties expressly agree that the Uniform Computer Information Transactions Act ("UCITA") applicable in any jurisdiction shall not apply to this License Agreement.

12.0 U.S. Government.

If Licensee is the U.S. Government, the Licensed Programs and documentation qualify as "commercial items," as that term is defined at Federal Acquisition Regulation ("FAR") (48 C.F.R.) 2.101, consisting of "commercial computer software" and "commercial computer software documentation" as such terms are used in FAR 12.212. Consistent with FAR 12.212, and notwithstanding any other FAR or other contractual clause to the contrary in any agreement into which the License Agreement may be incorporated, Customer may provide to Government end user or, if the License Agreement is direct, Government end user will acquire, the software and documentation with only those rights set forth in the License Agreement. Use of either the software or documentation or both constitutes agreement by the Government that the software and documentation are "commercial computer software" and "commercial computer software documentation," and constitutes acceptance of the rights and restrictions herein.

13.0 Agreement.

This License Agreement may be part of a Primary Agreement between LICENSOR and LICENSEE for the purchased products by LICENSEE from LICENSOR. The Primary Agreement and this License Agreement contain the full understanding of the parties with respect to the subject matter hereof and which supersede all prior understandings and writings relating thereto and which shall become binding on the Effective Date of this License Agreement. No waiver, consent, modification, amendment, or change to the terms of this License Agreement shall be binding unless agreed to in a writing signed by LICENSEE and LICENSOR. If there is any conflict between the terms of the Primary Agreement and this License Agreement as to the Licensed Programs, the terms of this License Agreement will prevail.

14.0 Notices.

Notices shall be provided as set forth in the Primary Agreement. In the event there is no notice provision in the Primary Agreement, notices and other communications between the parties shall be transmitted in writing by certified mail or nationally recognized overnight courier service.

15.0 Survival.

Sections 2, 3, 5, 6, 8, 9, 11, and 13 of this License Agreement shall survive termination of this agreement.

END USER LICENSE AGREEMENT
FOR
HARRIS BEON SOFTWARE APPLICATION

IMPORTANT - READ CAREFULLY:

THIS HARRIS END-USER LICENSE AGREEMENT ("AGREEMENT") IS A LEGAL AGREEMENT BETWEEN YOU (EITHER AN INDIVIDUAL OR A GOVERNMENTAL OR CORPORATE ENTITY HEREINAFTER REFERRED TO AS "THE DEPARTMENT") AND HARRIS CORPORATION ("SERVICE PROVIDER") FOR THE HARRIS SOFTWARE PRODUCTS IDENTIFIED BELOW (THE "LICENSED PROGRAMS"). BY DOWNLOADING, INSTALLING, COPYING, OR OTHERWISE USING THE LICENSED PROGRAMS OR BY CLICKING THE “ACCEPT” BUTTON AND AGREEING TO THESE TERMS AND CONDITIONS, YOU AS AN INDIVIDUAL AND, AS APPLICABLE, ON BEHALF OF THE DEPARTMENT ENTITY AGREE TO BE BOUND BY THE TERMS AND CONDITIONS OF THIS AGREEMENT, AND THIS AGREEMENT SHALL BE EFFECTIVE AS OF THE DATE OF YOUR FIRST INSTALLATION, COPYING OR USE OF THE LICENSED PROGRAMS OR THE DATE OF THE “ACCEPT” CLICK THROUGH. IF YOU DO NOT AGREE TO THE TERMS AND CONDITIONS OF THIS AGREEMENT, YOU SHOULD NOT CLICK THE “ACCEPT” BUTTON AND YOU ARE NOT AUTHORIZED TO DOWNLOAD, INSTALL OR USE THE LICENSED PROGRAMS AND YOU MUST IMMEDIATELY DELETE ANY LICENSED PROGRAMS THAT YOU MAY HAVE.

The DEPARTMENT and SERVICE PROVIDER agree as follows:

1. Definitions

1.1 "The DEPARTMENT" means:

1.1.1 If The DEPARTMENT is an individual, that individual;

1.1.2 If The DEPARTMENT is a government entity, all agencies, branches, departments and divisions that are legally part of that government entity; and

1.1.3 If The DEPARTMENT is a corporation, the legal entity that is the named The DEPARTMENT plus all other legal entities that are wholly owned by the named The DEPARTMENT.

1.2 "Contract(s)" means the separate written contract(s) or agreement(s), if any, between The DEPARTMENT and either SERVICE PROVIDER or another party authorized by SERVICE PROVIDER to provide the Licensed Programs to The DEPARTMENT. Each Contract will include the required execution of this End User License Agreement by The DEPARTMENT and The DEPARTMENT’s users prior to the installation and use of the Licensed Programs.

1.3 “Device” means the products used by The DEPARTMENT to run the Licensed Programs.

1.4 “Licensed Programs” means the object code version of the software programs including, without limitation, any scripts, interfaces, graphics, displays, text, images, artwork, drivers, photographs, animations, video, audio, music, text, applets, documentation, associated media, and other components or content provided as well as any services provided by SERVICE PROVIDER with the software, if any, together with any Modifications or Enhancements of the above items provided by SERVICE PROVIDER. This Agreement is limited to the object code programs only. No rights in or access to any source code or program listings are provided.

1.5 “Modifications and Enhancements” shall mean any updates, upgrades, patches, fixes, feature additions, modifications or enhancements of the Licensed Programs.

2. License Grant

2.1 Subject to the terms and conditions contained in this Agreement and the performance by The DEPARTMENT of its obligations hereunder, SERVICE PROVIDER hereby grants to The DEPARTMENT, and The DEPARTMENT hereby accepts from SERVICE PROVIDER, a personal, non-transferable, non-exclusive, limited license to use the Licensed Programs in accordance with any documentation that accompanies the Licensed Programs.

2.2 Any Modifications and Enhancements of the Licensed Programs that SERVICE PROVIDER chooses to make available to The DEPARTMENT shall be subject to the terms and conditions of this Agreement as well as any additional terms and conditions that may apply to the Modifications and Enhancements. This Agreement does not entitle The DEPARTMENT to receive any Modifications and Enhancements and any Modifications and Enhancements may be provided by SERVICE PROVIDER at its discretion.

3. The DEPARTMENT’s Obligations

3.1 The DEPARTMENT hereby accepts the Licensed Programs “AS IS” and shall determine the applicability of the Licensed Programs for The DEPARTMENT’s desired use on The DEPARTMENT’s Devices. Except as expressly set forth in the Contract, all installation, training and maintenance is the sole responsibility of The DEPARTMENT.

3.2 Nothing in this Agreement shall be construed as giving The DEPARTMENT any right to sell, assign, lease, or in any other manner transfer or encumber SERVICE PROVIDER’s ownership of the Licensed Programs.

3.3. The DEPARTMENT shall not duplicate the Licensed Programs, or any portion thereof, except The DEPARTMENT may make archival copies of the Licensed Programs in accordance with The DEPARTMENT’s documented standard computer software back-up procedures. The media containing such authorized copies shall have prominently placed thereon, without change or alteration, the same copyright notices and proprietary legends and markings that are on the delivered Licensed Programs media.

3.4 The techniques, algorithms, and processes contained in the Licensed Product constitute trade secrets of SERVICE PROVIDER. The DEPARTMENT agrees to take all measures reasonable and necessary to protect the confidentiality of the Licensed Product and SERVICE PROVIDER' rights therein. Except as expressly provided in the Contract between SERVICE PROVIDER and The DEPARTMENT, The DEPARTMENT may not rent, lease, network, display, or distribute the Licensed Programs to any third party without SERVICE PROVIDER’s prior written consent. Furthermore, The DEPARTMENT may not reverse engineer, disassemble, decompile, modify, alter, translate, or adapt the Licensed Programs or create any derivative thereof. The obligations set forth in this Subsection shall survive termination or expiration of this Agreement

3.5 The Licensed Programs are licensed as a single product and neither the individual programs comprising the Licensed Programs nor any Modifications or Enhancements may be separated for use by more than one concurrent user.

3.6 The act of copying any portion of the Licensed Programs as authorized hereunder shall not cause, or be construed as causing, any portion thereof to be considered as being in the public domain or generally available on a nonproprietary basis. All such copies shall be treated as confidential as required for original information under Section 3.3.

3.7 To the extent applicable, The DEPARTMENT must comply with all applicable privacy, consumer data and protection laws and all laws that apply to collecting, accessing, storing, processing, using, disclosing and securing user data, including any obligations to notify and obtain consents of users regarding The DEPARTMENT's access to users' personal information.

3.8 In addition to any license fees and other compensation paid for the use of the Licensed Programs, The DEPARTMENT shall pay the gross amount of any present or future sales, use, excise, value-added, or other similar tax applicable to the price, sale or any Products or services furnished hereunder or to their use by SERVICE PROVIDER or The DEPARTMENT, or The DEPARTMENT shall otherwise furnish SERVICE PROVIDER with tax exemption certificates acceptable to all applicable taxing authorities.

4. Ownership

The DEPARTMENT is given possession of a copy of the Licensed Programs, but SERVICE PROVIDER shall at all times retain title or full ownership interest in such Licensed Programs and all Modifications and Enhancements thereof, regardless of the form or media in or on which the original and other copies thereof may subsequently exist. All rights, title, and copyrights in and to the Licensed Programs (including, but not limited to, any images, photographs, animations, video, audio, music, text, and applets incorporated into the Licensed Programs), the accompanying printed materials, and any copies of the Licensed Programs are owned by SERVICE PROVIDER and/or its licensors. Nothing contained herein shall be deemed to convey any title or ownership interest in the Licensed Programs to The DEPARTMENT.

5. Warranty

5.1 Provided: (a) that connectivity and interoperability of The DEPARTMENT's Device with the cellular commercial carrier network or other third party network being used by The DEPARTMENT is fully available and fully functioning; and (b) that the Licensed Programs are used on a Device designated by SERVICE PROVIDER as acceptable for Licensed Programs' use, and (c) correct input data is supplied to The DEPARTMENT's Device, SERVICE PROVIDER warrants, for a period of ninety (90) calendar days from the download of the Licensed Programs onto The DEPARTMENT's Device, that the Licensed Programs furnished to The DEPARTMENT by SERVICE PROVIDER shall be capable of successfully operating on The DEPARTMENT's Device in accordance with the logic defined in the Licensed Programs' operator manuals or other official supporting documentation designated by SERVICE PROVIDER for the Licensed Programs. If, on the basis of evidence submitted to SERVICE PROVIDER within the ninety (90) calendar day term of this warranty, it is shown that any Licensed Program does not meet this warranty, SERVICE PROVIDER, at its option, will either: (i) correct the defect or error in the Licensed Program free of charge and provide a corrected Licensed Program, or (ii) make available to The DEPARTMENT free of charge a satisfactory substitute Licensed Program.

5.2 SERVICE PROVIDER is unable to and cannot guarantee either the extent or consistency of the wireless coverage and communications of a cellular commercial carrier's network or other third party network nor can SERVICE PROVIDER guarantee the quality of the data service provided. Given the dependency on commercial cellular and third party networks, the use of the Licensed Programs, including location information, is not intended for mission critical communications but rather for administrative and other communications.

IN PARTICULAR, SINCE THE LICENSED PROGRAMS' PERFORMANCE, FEATURES AND FUNCTIONALITY MAY BE UNAVAILABLE, IMPRECISE OR INACCURATE DEPENDING ON SYSTEM, NETWORK, CAPACITY, ENVIRONMENTAL, TERRAIN, COMPATIBILITY, INTEROPERABILITY AND OTHER CONDITIONS, SERVICE PROVIDER AND ITS THIRD

PARTY SUPPLIERS AND SUBCONTRACTORS HEREBY DISCLAIM, EXCEPT FOR THE EXPRESS WARRANTY SET FORTH IN SECTION 5.1 ABOVE, ALL OTHER EXPRESS OR IMPLIED WARRANTIES AND CONDITIONS, WHETHER ORAL, EXPRESS, OR IMPLIED, INCLUDING, WITHOUT LIMITATION, WARRANTIES AND CONDITIONS OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, PERFORMANCE, ACCURACY, RELIABILITY, AND NONINFRINGEMENT, WHETHER SUCH WARRANTIES OR CONDITIONS MAY BE IMPLIED BY STATUTE, CUSTOM, COURSE OF DEALING BETWEEN THE PARTIES, TRADE USAGE OR COMMON LAW. FURTHERMORE, EXCEPT FOR THE EXPRESS WARRANTY SET FORTH IN SECTION 5.1 ABOVE, SERVICE PROVIDER AND ITS THIRD PARTY SUPPLIERS AND SUBCONTRACTORS MAKE NO OTHER WARRANTY THAT THE LICENSED PROGRAMS OR THIRD PARTY CONTENT AND SERVICES PROVIDED AS PART OF THE LICENSED PROGRAMS (INCLUDING, WITHOUT LIMITATION, LOCATION DATA) WILL BE UNINTERRUPTED, ACCURATE, RELIABLE, TIMELY, SECURE, FREE FROM VIRUSES OR OTHER HARMFUL COMPONENTS OR ERROR-FREE.

5.3 THE WARRANTIES AND REMEDIES SET FORTH IN THIS SECTION 5 CONSTITUTE THE ONLY WARRANTIES WITH RESPECT TO THE LICENSED PROGRAMS AND ANY MODIFICATIONS OR ENHANCEMENTS TO THE LICENSED PROGRAMS PROVIDED BY SERVICE PROVIDER. THE WARRANTIES AND REMEDIES SET FORTH IN THIS SECTION 5 CONSTITUTE THE DEPARTMENT'S EXCLUSIVE REMEDIES IN THE EVENT SUCH WARRANTIES ARE BREACHED. THEY ARE IN LIEU OF ALL OTHER WARRANTIES WHETHER WRITTEN, ORAL, EXPRESS, IMPLIED, OR STATUTORY INCLUDING, WITHOUT LIMITATION, THE WARRANTY OF MERCHANTABILITY AND THE WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL SERVICE PROVIDER BE LIABLE FOR SPECIAL, CONSEQUENTIAL OR INDIRECT DAMAGES INCLUDING, BUT NOT LIMITED TO, LOSS OF PROFITS OR REVENUES.

6. HIGH RISK ACTIVITIES; LOCATION DATA

6.1 THE LICENSED PROGRAMS ARE NOT FAULT-TOLERANT AND ARE NOT DESIGNED, MANUFACTURED OR INTENDED FOR ANY USE REQUIRING FAIL-SAFE, EMERGENCY OR MISSION CRITICAL PERFORMANCE IN WHICH THE FAILURE OF A LICENSED PROGRAM COULD LEAD TO DEATH, PERSONAL INJURY, PHYSICAL OR ENVIRONMENTAL DAMAGE. THIS USE RESTRICTION INCLUDES, WITHOUT LIMITATION, THE OPERATION OF AIRCRAFT AND THE DESIGN, CONSTRUCTION, OPERATION AND MAINTENANCE OF NUCLEAR FACILITIES.

6.2 ANY LOCATION DATA INCLUDED IN THE LICENSED PROGRAMS IS FOR BASIC INFORMATIONAL PURPOSES ONLY AND IS NOT INTENDED TO BE RELIED UPON IN SITUATIONS WHERE PRECISE LOCATION INFORMATION IS NEEDED OR WHERE ERRONEOUS, INACCURATE OR INCOMPLETE LOCATION DATA MAY LEAD TO DEATH, PERSONAL INJURY, PROPERTY OR ENVIRONMENTAL DAMAGE. NEITHER SERVICE PROVIDER NOR ITS SUBCONTRACTORS AND SUPPLIERS CAN GUARANTEE THE AVAILABILITY, ACCURACY, COMPLETENESS AND RELIABILITY OF THE LOCATION DATA INCLUDED IN THE LICENSED PROGRAMS.

7. LIMITATION OF LIABILITY

7.1 The total liability of SERVICE PROVIDER, including its third party subcontractors and suppliers, for all claims of any kind for any loss or damage, whether in contract, warranty, tort (including negligence or infringement), strict liability or otherwise, arising out of, connected with, or resulting from the performance or non-performance of this Agreement or from the use of the Licensed Programs shall not exceed the total amount of license fees and other amounts paid by The DEPARTMENT to SERVICE PROVIDER for the purchase and use of the Licensed Programs.

7.2 IN NO EVENT, WHETHER AS A RESULT OF BREACH OF AGREEMENT, WARRANTY, TORT (INCLUDING NEGLIGENCE OR INFRINGEMENT), STRICT LIABILITY OR OTHERWISE, SHALL SERVICE PROVIDER, OR ITS SUBCONTRACTORS OR SUPPLIERS, BE LIABLE FOR ANY SPECIAL, CONSEQUENTIAL, INCIDENTAL, INDIRECT OR EXEMPLARY DAMAGES, INCLUDING, BUT NOT LIMITED TO, LOSS OF PROFITS OR REVENUES, LOSS OF USE OF A DEVICE OR ANY OTHER HARDWARE OR EQUIPMENT, COST OF CAPITAL, COST OF SUBSTITUTE GOODS, FACILITIES, SERVICES OR DOWNTIME COSTS.

7.3 The provisions of this Section, LIMITATION OF LIABILITY, shall apply notwithstanding any other provisions of this Agreement or any other agreement and shall survive the expiration or termination of this Agreement.

8. Term and Termination.

8.1 Except as expressly set forth in a Contract providing for a shorter term and unless earlier terminated as provided herein, the term of this Agreement shall be perpetual. If a shorter term is set forth in the Contract, the term of this Agreement shall be the shorter term set forth in the Contract.

8.2 This Agreement may be terminated at any time by written mutual agreement of the parties.

8.3 SERVICE PROVIDER reserves the right, in addition to any other remedies it may retain in this Agreement or may be entitled to in law or equity, to terminate this Agreement at any time prior to the expiration of any Term in the event:

8.3.1 The DEPARTMENT breaches any material term or condition or fails to perform or observe any obligations or covenants of this Agreement or the Contract and such failure and/or breach is not remedied within thirty (30) calendar days of written notice from SERVICE PROVIDER; or

8.3.2 The DEPARTMENT petitions for reorganization, readjustment or rearrangement of its business affairs under any laws or governmental regulations relating to bankruptcy or insolvency, or is adjudicated bankrupt or if a receiver is appointed for The DEPARTMENT, or if The DEPARTMENT makes or attempts to make an assignment for the benefit of creditors, or is unable to meet its obligations in the normal course or business as they fall due.

8.4 In the event this Agreement expires or is revoked or terminated by SERVICE PROVIDER, it is agreed that (a) such termination or revocation shall not affect any provisions of the Agreement which by their nature are inherently intended to survive expiration or termination, and (b) The DEPARTMENT shall be entitled to a reasonable period of time to wind down its use of the Licensed Programs in an orderly fashion, after which The DEPARTMENT shall discontinue use of the Licensed Programs. To discontinue the use of the Licensed Programs, The DEPARTMENT shall un-install and remove the Licensed Programs from The DEPARTMENT’s Devices and delete all copies of the Licensed Programs in The DEPARTMENT’s possession.

9. U.S. Government Contracts

9.1 The DEPARTMENT agrees that it will not use the Licensed Programs in the performance of a contract, or subcontract, with the U.S. Government in a manner so as to affect SERVICE PROVIDER's rights to Licensed Programs. If The DEPARTMENT desires to use the Licensed Programs in the performance of a contract, or subcontract, with the U.S. Government, prior to such use The DEPARTMENT shall consult with SERVICE PROVIDER as to the procedures and use of restrictive markings required to protect the ownership interest of SERVICE PROVIDER.

9.2 If The DEPARTMENT is an agency or department of the U.S. Government, then the following notice applies: The Licensed Programs is Commercial Computer Software as defined in 48 CFR 227.7201 through 227.7202-4 and in 48 CFR 2.101 and 12.212, as appropriate or any equivalent regulations of other governmental agencies, and the rights of the U.S. Government to utilize the Licensed Programs are those expressly set forth in this Agreement. The U.S. Government does not receive unlimited rights to the Licensed Programs. The contractor is Harris Corporation, acting by and through its RF Communications Division, 221 Jefferson Ridge Parkway, Lynchburg, Virginia 24501.

10. Export Control

10.1 The export regulations of the United States prohibit, with certain exceptions, the export from the United States or the transfer to foreign persons (non-U.S. citizens or "green card" permanent residents), whether in the U.S. or abroad, of technical data relating to certain commodities unless the exporter has obtained written authorization from the U.S. Government and received written assurance from the foreign importer that the technical data will not be further exported without permission of the exporter and the cognizant U.S. Government agency. The DEPARTMENT agrees to comply fully with all relevant regulations of the United States to assure that no violation of such regulations occurs.

10.2 The DEPARTMENT further acknowledges that violations of these laws and regulations include, but are not limited to, exporting or re-exporting, or otherwise supplying or providing access to the Licensed Programs, the accompanying documentation or any other materials provided by SERVICE PROVIDER, to: (a) any country against which the United States imposes trade sanctions or export controls; (b) persons on the U.S. Commerce Department's Denied Parties List or Entity List, the U.S. Treasury Department's Specially Designated Nationals List, or the U.S. State Department's List of Debarred Parties; (c) end uses related to nuclear weapons, missile technology, or chemical/biological weapons; or (d) any destination for which an export license is required.

10.3 The DEPARTMENT further acknowledges that the export of the Licensed Programs, documentation and any other materials provided by SERVICE PROVIDER may be controlled by the U.S. State Department's Office of Defense Trade Controls, through the Arms Export Control Act as implemented in the International Traffic in Arms Regulations, 22 C.F.R. §§ 120-130 ("ITAR"),the U.S. Commerce Department's Bureau of Industry and Security, through the Export Administration Act as implemented in the Export Administration Regulations, 15 C.F.R. §§ 730-774 ("EAR"), and/or the U.S. Treasury Department's Office of Foreign Assets Control, and depending on which agency has jurisdiction over these items different restrictions on export, re-export, and use activities will apply. The DEPARTMENT agrees that it is The DEPARTMENT's responsibility to determine which of these U.S. agencies has export control jurisdiction over the Licensed Programs, documentation, and any other materials provided by SERVICE PROVIDER, and The DEPARTMENT acknowledges that export jurisdiction over these items may change from time to time.

10.4 Further, The DEPARTMENT agrees that any violation by The DEPARTMENT of any of these laws and regulations will also constitute material breach of this Agreement, and The DEPARTMENT agrees to indemnify SERVICE PROVIDER against any criminal or civil monetary sanctions, costs, losses or expenses (including but not limited to reasonable attorneys' fees and costs) resulting from The DEPARTMENT's failure to comply. The DEPARTMENT agrees to defend, indemnify and hold SERVICE PROVIDER, and its officers, directors, agents and employees harmless against all criminal and/or civil monetary sanctions, costs, losses or expenses (including but not limited to reasonable attorneys' fees and costs) incurred as a result of any failure on The DEPARTMENT's part to comply with these laws. The DEPARTMENT further agrees to notify The DEPARTMENT's of, and to use best efforts to ensure their compliance with,

the restrictions imposed by these laws and regulations.

11. Maintenance Support

SERVICE PROVIDER may, from time to time, issue Modifications and Enhancements to the Licensed Programs. If SERVICE PROVIDER should issue a Modification or Enhancement to the Licensed Programs, The DEPARTMENT may obtain such Modification or Enhancement at the current price then charged by SERVICE PROVIDER or the price set forth in the Contract, as applicable.

12. Intellectual Property Indemnification

12.1 SERVICE PROVIDER agrees that it shall, at its own expense and at its option, defend or settle any claim, suit, or proceeding brought against The DEPARTMENT, based on an allegation that the Licensed Program furnished under this Agreement constitutes a direct or a contributory infringement of any claim of any United States patent, mask work, copyright or any other intellectual property right. This obligation shall be effective only if The DEPARTMENT shall have made all payments then due to SERVICE PROVIDER for the purchase and/or use of the Licensed Programs and if SERVICE PROVIDER is notified of said allegation promptly in writing and given authority, information, and assistance for the settlement or defense of said claim, suit, or proceeding. If, in any such suit arising from such claim, the continued use of the Licensed Programs for the purpose intended is enjoined by any court of competent jurisdiction, SERVICE PROVIDER shall, at its expense and option, either: (a) procure for The DEPARTMENT the right to continue using the Licensed Programs, or (b) modify the Licensed Programs so that they become non-infringing, or (c) replace the Licensed Programs or portions thereof so that they become non-infringing, or (d) remove the Licensed Programs and refund the license fee paid by The DEPARTMENT to purchase the Licensed Programs license (less reasonable depreciation for use). The foregoing states the entire liability of SERVICE PROVIDER for intellectual property infringement by the Licensed Programs and is subject to any limitation of total liability set forth in this Agreement.

12.2 The preceding subsection 12.1 shall not apply to the use of the Licensed Programs in conjunction with any other hardware or software not supplied by SERVICE PROVIDER to the extent that such conjoined use causes the alleged infringement. As to any portion of the Licensed Programs or use described in the preceding sentence, SERVICE PROVIDER assumes no liability whatsoever for intellectual property right infringement.

12.3 THE INTELLECTUAL PROPERTY INDEMNITY OBLIGATIONS RECITED ABOVE ARE IN LIEU OF ALL OTHER INTELLECTUAL PROPERTY INDEMNITIES WHATSOEVER, WHETHER ORAL, WRITTEN, EXPRESS, IMPLIED OR STATUTORY.

13. Third-Party Software Licenses

Licensed Programs contain material original to SERVICE PROVIDER and may contain material provided by third parties either under separate end-user license agreements or under Open Source licenses. Open Source Licensed Programs are provided under license from individual third party sources, identified in the Appendix attached to the end of this license agreement, if any. Each Open Source third party software license is incorporated herein verbatim from the source and the terms and conditions thereof are accepted by The DEPARTMENT as a condition of use of the Licensed Programs. As used herein, Open Source means any software that is licensed under terms in any license for software which require, as a condition of use, modification and/or distribution of such software or of other software incorporated into, derived from or distributed with such software (hereinafter referred to as "Work"), any of the following: (a) the making available of source code or design information regarding the Work; (b) the granting of

permission for creating derivative works regarding the Work; or (c) the granting of a royalty-free license to any party under intellectual property rights regarding the Work. By means of example and without limitation Open Source includes the following licenses or distribution models: the GNU General Public License (GPL), the GNU Lesser or Library GPL (LGPL), or any similar open source, free software or community licenses. Under no circumstances shall The DEPARTMENT combine Licensed Programs with any Open Source Software not supplied by SERVICE PROVIDER in any way. Third party software products included in the Licensed Programs are only to be used with the Licensed Programs for The DEPARTMENT's internal business purposes and are not to be used, modified or further developed for other purposes.

14. Assignment/Transfer.

This Agreement, the licenses granted hereunder and the Licensed Programs provided to The DEPARTMENT under this Agreement may not be assigned, sub-licensed, or otherwise transferred by The DEPARTMENT to any third party without SERVICE PROVIDER's express prior written consent. Subject to the foregoing, any assignee hereunder shall be subject to all of the terms, conditions, and provisions of this Agreement. Any attempt by The DEPARTMENT to assign, sub-license, or transfer the Licensed Programs, or any of the rights or duties contained in this Agreement, without SERVICE PROVIDER's prior written consent shall be void.

15. Severability.

If any term or provision of the Agreement is determined by a court or government agency of competent jurisdiction to be invalid under any applicable statute or rule of law, such provision(s) are, to that extent, deemed omitted, but this Agreement and the remainder of its provision shall otherwise remain in full force and effect.

16. Waiver.

No waiver will be implied from conduct or failure to enforce rights. No waiver will be effective unless in writing signed on behalf of the party against whom the waiver is asserted.

17. General

17.1 This Agreement supersedes all prior agreements, proposals, representations, and communications between SERVICE PROVIDER and The DEPARTMENT relating to the Licensed Programs. In the event of a conflict in the terms and provisions of this Agreement and the terms and provisions of a Contract, the terms and provisions of this Agreement shall govern.

17.2 The headings for each section are stated for convenience only and are not to be construed as limiting.

17.3 Under the terms of this Agreement, The DEPARTMENT is a licensee of SERVICE PROVIDER. The DEPARTMENT is not an employee, agent, partner, contractor or representative of SERVICE PROVIDER. The respective obligations and rights of SERVICE PROVIDER and The DEPARTMENT are specifically limited by the terms of this Agreement. The DEPARTMENT hereby specifically acknowledges that it does not have authority to incur any obligations or responsibilities on behalf of SERVICE PROVIDER.

17.4 The DEPARTMENT acknowledges that any unauthorized use or disclosure of Licensed Programs will cause irreparable damage to SERVICE PROVIDER and that injunctive relief or other equitable remedies may be necessary to prevent or minimize such damage to SERVICE PROVIDER. The DEPARTMENT agrees that it will not contest the applicability of injunctive relief on any grounds other than no unauthorized use or disclosure of Licensed Programs has occurred.

In addition, SERVICE PROVIDER shall not be required to provide a bond or other financial security to obtain injunctive relief.

17.5 Nothing in this Agreement shall limit SERVICE PROVIDER from using the Licensed Programs and/or licensing the Licensed Programs to other parties.

17.6 Governing Law

17.6.1 It is expressly understood and agreed to by SERVICE PROVIDER and a The DEPARTMENT located in the United States that in the event of any disagreement or controversy between the parties, the terms and conditions of this Agreement shall be governed by the laws of the state set forth in the Contract between SERVICE PROVIDER and The DEPARTMENT without regard to that state's conflicts of laws principles. In the event that no such governing law state is established in the Contract between SERVICE PROVIDER and The DEPARTMENT, then it is expressly understood and agreed to by the parties hereto that in the event of any disagreement or controversy between the parties, the terms and conditions of this Agreement shall be governed by the laws of the State of Nevada without regard to its conflict of laws provisions.

17.6.2 If The DEPARTMENT is located outside of the United States, then, without limiting either party's right to seek injunctive or other equitable relief in court, either party may elect (by written notice given prior to filing a complaint or, in the case of the defendant, prior to answering a complaint) to resolve a dispute by binding arbitration in the English language in London, Great Britain, under the International Arbitration Rules of the International Centre for Dispute Resolution; the decision of the arbitrator will be enforceable in any court. The original of this Agreement has been written in the English language and that version will apply if there is any dispute.

17.6.3 Both SERVICE PROVIDER and The DEPARTMENT agree to exclude application of the U.N. Convention of Contracts for the International Sale of Goods and the Uniform Computer Information Transactions Act (UCITA) to this Agreement, if either were otherwise applicable.

APPENDIX

Open Source Licensed Programs
(See Article 13)

Third Party SW	Licenses	License Location
Android LogBack	GNU LGPL 2.1	https://github.com/twall/jna/blob/master/LGPL2.1
SLF4J	MIT license	http://slf4j.org/license.html
Google Maps	Google	https://developers.google.com/maps/licensing

ATTACHMENT C

Consultant's Name:	Enter Name

LIVE SCAN FINGERPRINTING INSTRUCTIONS

1. The consultant ***MUST*** take with them and provide to DPS the following when they go to do their LiveScan fingerprinting:

   A. A money order or cashier's check made payable to General Services Division in the amount of $36.25 (as of October 1, 2016).

   B. The Fingerprint Request Form provided by Jeramie Brown or designee from the NDOT Purchasing Division.

FOR DPS LIVE SCAN PROCESSING OF FINGERPRINTS

1. *In order to do the Live Scan fingerprinting, the consultant must call and make an appointment at the Department of Public Safety (DPS). The phone number is:*

   A. ***775-684-6262*** – individual needs to make an appointment and also call the morning they are going to go to make sure the machine is functioning.

2. *The address for the Live Scan fingerprinting is:*

   Department of Public Safety (DPS) Records and Technology Division
   333 West Nye Lane, Suite 100
   Carson City, NV 89706

3. ***Please Note: If you are more than five (5) minutes late in arriving for your Live Scan appointment, DPS may turn you away requiring the appointment to be rescheduled and final system access authorization to be delayed.***

4. *DPS will submit the results to the agency for vetting. Upon a clean check, the agency will provide final system access authorization.*

Revised: 06-30-17

Nevada Department of Public Safety

FINGERPRINT BACKGROUND WAIVER

As an applicant who is the subject of a Federal Bureau of Investigation (FBI) fingerprint-based criminal history record check for a noncriminal justice purpose you have certain rights which are discussed below.

1. You must be notified by (enter name of requesting agency) Nevada Department of Transportation that your fingerprints will be used to check the criminal history records of the FBI and the State of Nevada.

2. If you have a criminal history record, the officials making a determination of your suitability for the job, license or other benefit for which you are applying must provide you the opportunity to complete or challenge the accuracy of the information in the record. You may review and challenge the accuracy of any and all criminal history records which are returned to the submitting agency. The proper forms and procedures will be furnished to you by the Nevada Department of Public Safety, Records Bureau upon request. If you decide to challenge the accuracy or completeness of you FBI criminal history record, Title 28 of the Code of Federal Regulations Section 16.34 provides for the proper procedure to do so:

> **16.34 - Procedure to obtain change, correction or updating of identification records.**
> If, after reviewing his/her identification record, the subject thereof believes that it is incorrect or incomplete in any respect and wishes changes, corrections or updating of the alleged deficiency, he/she should make application directly to the agency which contributed the questioned information. The subject of a record may also direct his/her challenge as to the accuracy or completeness of any entry on his/her record to the FBI, Criminal Justice Information Services (CJIS) Division ATTN: SCU, Mod. D-2, 1000 Custer Hollow Road, Clarksburg, WV 26306. The FBI will then forward the challenge to the agency which submitted the data requesting that agency to verify or correct the challenged entry. Upon the receipt of an official communication directly from the agency which contributed the original information, the FBI CJIS Division will make any changes necessary in accordance with the information supplied by that agency.

3. Based on 28 CFR § 50.12 (b), officials making such determinations should not deny the license or employment based on information in the record until the applicant has been afforded a reasonable time to correct or complete the record or has declined to do so.

4. You have the right to expect that officials receiving the results of the fingerprint-based criminal history record check will use it only for authorized purposes and will not retain or disseminate it in violation of federal or state statute, regulation or executive order, or rule, procedure or standard established by the National Crime Prevention and Privacy Compact Council.

5. I hereby authorize (enter name of requesting agency) Nevada Department of Transportation, to submit a set of my fingerprints to the Nevada Department Public Safety, Records Bureau for the purpose of accessing and reviewing State of Nevada and FBI criminal history records that may pertain to me.

In giving this authorization, I expressly understand that the records may include information pertaining to notations of arrest, detainments, indictments, information or other charges for which the final court disposition is pending or is unknown to the above referenced agency. For records containing final court disposition information, I understand that the release may include information pertaining to dismissals, acquittals, convictions, sentences, correctional supervision information and information concerning the status of my parole or probation when applicable.

6. I hereby release from liability and promise to hold harmless under any and all causes of legal action, the State of Nevada, its officer(s), agent(s) and/or employee(s) who conducted my criminal history records search and provided information to the submitting agency for any statement(s), omission(s), or infringement(s) upon my current legal rights. I further release and promise to hold harmless and covenant not to sue any persons, firms, institutions or agencies providing such information to the State of Nevada on the basis of their disclosures. I have signed this release voluntarily and of my own free will.

A reproduction of this authorization for release of information by photocopy, facsimile or similar process, shall for all purposes be as valid as the original.

In consideration for processing my application I, the undersigned, whose name and signature voluntarily appears below; do hereby and irrevocably agree to the above.

Applicant's Name: _____
(PLEASE PRINT LAST, FIRST, MIDDLE)

Address: _____

Applicant's Signature: _____

Date: _____

Submitting Agency: Nevada Department of Transportation

Address: 1263 South Stewart Street, Carson City, NV 89712

Agency representative: Jeramie Brown
(PLEASE PRINT LAST, FIRST, MIDDLE

Agency representative's Signature: _____

Date: _____

STATE OF NEVADA FINGERPRINT REQUEST FORM

Applicant: ***Please provide this form to the fingerprint technician/official at the time the fingerprints are taken to ensure that all fields contain the required/authorized information needed for processing.***

Fingerprint technician: ***Please ensure that you see photo ID for identity verification purposes prior to fingerprinting.***

APPLICANT INFORMATION							
Applicant Name (Last, First, MI):							
Applicant Address:							
City, State, Zip:							
Date of Birth:				Place of Birth:			
SSN (if required):				Citizenship:			
Sex:		Race:					
Height:		Weight:		Eyes:		Hair:	

AUTHORIZED ENTITY INFORMATION			
Account Number (MNU):	**151654**	ORI:	**NV0131700**
Bill to Account Number (MNU): (If applicable)	**Cash**	Reason Fingerprinted: (NRS or Public Law)	**NRS239B.010.B**
Submit Fingerprints Electronic Livescan:			
Yes:	X	No: (If no, please print hand cards and return to applicant for manual submission:	

SIGNATURE OF AUTHORIZATION *Signature of Employer or Authorized Entity Requesting Fingerprints*
Jeramie L Brown on behalf of Nevada Department of Transportation

FINGERPRINT SITE INFORMATION			
Signature of Official Taking Prints:		Date:	
TCN Number: (Used for Tracking Purposes)			

PRIOR ARRESTS AND CRIMINAL CONVICTION DISCLOSURE

Employee/Contractor Name:	

State Agency Name:	Nevada Department of Transportation

Contract or Project Name (if applicable):	

Commented [LD1]: You can enter your project name or contract gives you a reference as to what it was for.

Prior Arrests/Criminal Conviction/Traffic Violations

(Omitting or providing incomplete information is a basis for rejecting an applicant)

Have you ever been arrested? ☐ Yes ☐ No

Have you ever been convicted of a misdemeanor, gross misdemeanor or felony (exclude juvenile adjudication)? ☐ Yes ☐ No

Have you received a moving traffic violation within the last five years? ☐ Yes ☐ No

If yes, give date(s), time(s), locations(s), circumstance(s), and dollar amount of fine(s). Include any conditions of your parole and/or probation, if applicable. Moving traffic violations will only be considered if driving a vehicle is a job requirement. An arrest or criminal conviction is not an automatic bar to employment. Each case is considered on its individual merits.

DATE	TIME	LOCATION	CIRCUMSTANCE	FINE AMOUNT

Remarks:

Employee/Contractor Signature:_____Date:_____

State of Nevada

Information Security Committee

Standard

Control No.	Rev.	Title	Effective Date	Page
105	G	Personnel Security	2/03/2017	1 of 4

1.0 PURPOSE

This standard establishes the minimum Personnel Security standards for users of State information and information technology (IT).

The greatest harm/disruption to a system comes from the actions of individuals, both intentional and unintentional.

The Personnel Security process begins with a review of the user's mission needs, relevant policies, regulations, standards, and threats for a defined environment. Their interaction with the information systems, their roles, responsibilities, and authorities must be identified and documented.

2.0 SCOPE

This standard applies to all state agencies meeting the requirements identified in the State Information Security Consolidated Policy, Section 1.1, Scope and Applicability.

3.0 EFFECTIVE DATES

This standard becomes effective at the time of approval of the State Chief Information Officer (CIO).

4.0 RESPONSIBILITIES

The agency head and appointed agency Information Security Officer (ISO) have the responsibility to ensure the implementation of and compliance with this standard.

Agency management and personnel staff are responsible for coordinating and cooperating with the ISO to ensure compliance with the requirements of this standard.

5.0 RELATED DOCUMENTS

State Information Security Consolidated Policy, 100
State Information Security Officer (ISO) Roles and Responsibilities, 102

6.0 STANDARDS

A. Positions shall be identified and classified with regard to the sensitivity of the data they control or process and the facilities to which they have access. Agency managers and ISOs shall use the following guidelines to determine sensitive positions. If the position:

   1) Has a major responsibility for the development, planning, direction, or implementation of a computer system.
   2) Has a major responsibility for the development, planning, direction or implementation of a computer security program.

3) Has approval authority for major component of a computer system, including hardware and software.
4) Has the ability to cause grave damage to a system or realize significant personal gain through their access or responsibility.
5) Has the potential for detrimentally impacting computer security.
6) Has duties of considerable importance to the agency IT mission, with significant program responsibilities.
7) Has access to, or affect the processing of, proprietary data or privileged information.

B. The following IT positions, at a minimum, shall be identified as sensitive positions:

1) Positions grade 39 and above.
2) Managers
3) Security Officers
4) Systems Administrators
5) Systems Maintenance
6) Network Administrators
7) Database Administrators
8) Programmers
9) Backup Administrators
10) Contractors and Vendors who work for or provide IT services to the state

C. Employees who will hold sensitive positions shall have pre-employment screenings, which are documented and maintained within the agency Personnel File. Please refer to NAC 284.317 below as a guideline for such screenings.

NAC 284.317 Investigations of applicants; minimum age requirement.

1. To determine whether an applicant meets the minimum qualifications established for the class or position and other necessary criteria, the Division of Human Resource Management may require evidence of United States citizenship, alien status, discharge under honorable circumstances from the Armed Forces of the United States, possession of valid licenses for various purposes, educational transcripts or other evidence of identification and qualification. Except as otherwise provided in, NAC 284.325 with respect for a veteran's preference, any required information which is not received by the time of certification will be cause for the Director to decline to certify the applicant.
2. A reasonable minimum age requirement may be established for any position that involves public safety, supervision or care of wards of the State of Nevada, hazardous working conditions or other unusual circumstances. If such a minimum age requirement is established, it must be specified in the approved class specification or the publicized job announcement and an applicant shall, upon request, submit appropriate proof of age to the Division of Human Resource Management.
3. The Division of Human Resource Management or employing agency may investigate an applicant's character, past employment, education, and experience and, as allowed by specific statute, criminal background. [Personnel Div., Rule IV part § A, eff. 8-11-73; Rule IV § B, eff. 8-11-73]—(NAC A by Dep't of Personnel, 10-26-84; 7-6-92; A by Personnel Comm'n by R183-03, 1-27-2004)

D. All agencies will comply with existing state and federal laws, and regulations that impose significant responsibilities on employees for the security of information.

E. Employees shall sign a Letter of Agreement and/or Non-disclosure Agreement before access is allowed to information or information systems indicating that they understand their role and responsibilities for securing information and protecting information technology. These requirements shall normally be accomplished through the New Employee Orientation and/or Information Security Awareness Training.

F. Sensitive positions shall have critical functions divided among different individuals (separation of duties), whenever possible, to ensure that no individual has all necessary authority or information access that could result in fraudulent activities and misuse of confidential/privileged information.

6.0.1 BACKGROUND CHECKS

A. Background checks shall be conducted on all positions determined to be sensitive and is supported by NRS 239B, Disclosure of Personal Information to Governmental Agencies.

B. Fingerprint checks shall be submitted to the Department of Public Safety. The agency may absorb the applicable fees for fingerprinting and background checks. Fingerprinting must be done by a law enforcement agency.

C. Unfavorable results from a background check are not an automatic cause to refuse employment or cause termination. The agency head after consult with the State Chief Information Security Officer (CISO) has the final decision on action to be taken or not taken based on any unfavorable results. The agency head after consult with the CISO shall consider a conviction in any jurisdiction of any crime involving moral turpitude or indicating a lack of business integrity or honesty, whether denominated a felony or misdemeanor, to be an unfavorable result of a background check.

D. A list of agency employees/contractors holding sensitive positions as provided in Section 6.0 shall be maintained by the agency ISO. The list shall be updated within 30 days of any change in status (e.g. new hire appointment completion date, termination, functional responsibility change, etc.). The list shall include: name of employee/contractor; functional IT responsibility; status of background investigation; and date of completed appointment.

6.0.2 TERMINATION

A. Agencies will establish, implement and maintain procedures for processing terminations, both voluntary and involuntary, of employees. The procedures for processing termination involving sensitive positions or access to sensitive information shall be more restrictive than those in non-sensitive positions.

B. When an employee is involuntarily terminated from employment, all system access privileges will be immediately revoked and the employee is to be prevented from having any opportunity to access information or equipment.

State of Nevada

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Standard

7.0 DEFINITIONS

State Agency – The use of the term "State agency" in this document means every public agency, bureau, board, commission, department, division or any other unit of the Executive Branch of the government of the State of Nevada.

8.0 EXCEPTIONS/OTHER ISSUES

Requests for exception to the requirements of this Information Security Standard must be documented, provided to the Office of Information Security (OIS), and approved by the State Chief Information Security Officer (CISO).

Approved By		
Title	**Signature**	**Date**
State Information Security Committee	Approved by Committee	10/03/2016
State Chief Information Security Officer (CISO)	Signature on File	1/30/2017
State Chief Information Officer (CIO)	Signature on File	2/03/2017

Document History		
Revision	**Date**	**Change**
A	02/14/02	Initial release.
B	12/12/02	Revision to incorporate background checks
C	12/11/03	Revision to maintain sensitive position information, change to Section 6.0.1 paragraph B
D	10/03/06	Reviewed by ITSPC. One Change (6.0. paragraph C.1) Corrected reference to NRS to NAC.
E	06/30/11	Revision to update background check requirements, Section 6.0.1
F	01/22/15	Office of Information Security biennial review, replaces standard 4.04
G	9/29/16	Changes to Section 6.0.1 (A) and (D)

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Standard

Control No.	Rev.	Title	Effective Date	Page
106	D	Enterprise Physical Security and Environmental Controls	02/22/2018	**1** of **6**

PURPOSE

This standard establishes the minimum physical and environmental controls required for State information and information technology.

2.0 SCOPE

This standard applies to all state entities, state employees, contractors and all other authorized users, including outsourced third parties, who manage facilities to include IT data centers, offices or facilities that house telephone networks, data networks, servers, workstations, and other IT-related systems within or for the Executive Branch of Nevada State Government.

3.0 EFFECTIVE DATES

This standard becomes effective at the time of approval of the State Chief Information Officer (CIO).

4.0 RESPONSIBILITIES

The agency head and appointed Information Security Officer (ISO) have the responsibility to ensure the implementation of and compliance with this standard.

5.0 RELATED DOCUMENTS

State Information Security Consolidated Policy, 100
Information Security Officer (ISO) Roles and Responsibilities, 102

6.0 STANDARD

6.1 Physical Security Defined

A. The following are the essential elements of physical security:
   a. List or definition of assets to be protected
   b. List or definition of persons authorized for unescorted access
   c. List of threats determined to pose a significant risk
   d. Statement of an intended method for keeping the assets secured, allowing unescorted access only to authorized persons

B. All security decision should be based on an assessment of risk. The benefits of any security measure should be balanced against the direct costs as well as the indirect costs (e.g. inconvenience and extra tasks) of security measures. ISOs are responsible for identifying and presenting risks and the value of mitigations and security enhancements to management. The business decision to accept or mitigate risk should be made at the highest level of the business when sensitive information or valuable assets are involved.

C. The minimum standard for any physical security method or implementation is that a breach of security will be immediately, easily, and directly observable. Preventing unauthorized access is the ideal, but detecting unauthorized access is paramount.

   a. There are unusual methods and equipment that can breach many physical security implementations without leaving obvious traces. For the purposes of establishing a minimum security standard, consider only the skills of an ordinary person, with a high degree of motivation, and the tools commonly and locally available.

   b. Security measures chosen to protect assets should match the level of the threat to those assets. For instance, if a bad actor could be motivated to use lock pick skills and tools to obtain a high value asset, an agency should use RFID to secure the entrances, or use mitigating tools such as motion detectors and digital video recorders to ensure the agency is reasonably protected or at least aware of unauthorized access to secure sites.

6.2 Common Controls

A. Each agency site will have a written plan that addresses each of the essential elements of physical security listed in 6.1 (A), at a minimum. The plan will be reviewed at least annually, and the review will be documented.

B. The agency Information Security Officer (ISO) or his/her appointed representative shall, in accordance with the Information Security Policy Section 4.1, perform an on-site review of physical security and environmental control procedures annually, or whenever facilities, environment, and/or security procedures are significantly modified, and document review results.

C. Agencies planning for new, remodeled or leased office construction shall include the agency ISO during design phase requirements discussions and planning. Agencies will ensure all appropriate physical security controls and requirements are incorporated in the design.

D. The agency ISO or designee will verify the secure operation of controls at each entry point, for each site, annually. This includes all entry points, whether they are controlled by physical, electronic/technology, human, or other means. This review will be documented.

E. Visitors to secure areas will be escorted by an authorized person and a record of visits will be maintained for one year, at a minimum.

F. IT Infrastructure will not be directly accessible from public areas. This includes servers, communications equipment, plus low voltage and fiber optic data and voice cabling, and power and environmental infrastructure that serve the IT infrastructure. Infrastructure specifically built to interact with the public, such as a kiosk, is exempt from this requirement.

G. Computers, monitors, and other related equipment will not be placed so that active, usable data ports are within reach of members of the public. This includes USB, Ethernet, SCSI, serial, and any other ports capable of carrying data. The ports will be protected through physical placement of the device, measures that block port access such as port plugs or device cages, or software or other measures that prevent unauthorized use of the ports.

H. Monitors that are used to display controlled or confidential information will not be viewable from public areas. Covers that distort the screen image may be acceptable mitigations provided public spaces allow only angled views to the computer screen.

a. There is no distance limitation to this requirement since current technology can be used to successfully read a computer screen from hundreds of feet away.

b. Agency ISOs or designee will conduct annual audits of what can be viewed from public areas and through building windows.

6.3 IT Data Center Controls

A. Mainframe computers, network servers, voice and network relays, telecommunications equipment, desktop computers, and support peripheral devices shall be installed in physically secure and environmentally sound facilities or locations in accordance with industry and manufacturers standards.

B. Electrical considerations in respect to the location of IT equipment shall be considered, including but not limited to: avoidance of multiple systems on one electrical circuit, appropriate grounding, uninterruptible power supply units attached to critical systems, and surge protectors on computer and peripheral equipment.

C. Appropriate fire suppression devices shall be available and strategically located throughout the building and controlled computer areas and maintained in accordance with industry and manufacturers standards

D. Water damage precautions shall be considered with respect to computer facilities and equipment including installation of leak detection devices (water).

E. Environmental controls shall be installed to ensure that the facility and equipment are maintained within optimum operating conditions including, but not limited to temperature, humidity, and dust prevention.

F. Environmental controls shall also provide for the safety of personnel.

G. Controlled computer areas and related spaces, including but not limited to media and/or data storage and software libraries shall not be used as temporary storage rooms, lunch areas or

warehouses. All equipment, floors and work surfaces shall be cleaned regularly and maintained in accordance with industry and manufacturers standards.

H. Agency management or appointed ISO shall ensure backups of agency applications comply with State Security Standard 132.

6.4 Communications Room Controls

A. All computers, peripheral, media, data storage, mobile devices and network components outside the central computer room shall receive the level of security, based on the criticality of the equipment and the data processed, necessary to avoid damage, theft, and/or unauthorized access, and in accordance with industry and manufacturers standards.

B. Electrical considerations in respect to the location of IT equipment in the facility's designated communication room shall be considered, including but not limited to: avoidance of multiple systems on one electrical circuit, appropriate grounding, uninterruptible power supply units attached to critical systems when possible, and surge protectors on computer and peripheral equipment.

C. Appropriate fire suppression devices shall be available and strategically located in the communications room, and maintained in accordance with industry and manufacturers standards

D. Water damage precautions shall be considered with respect to the designated communications room and its associate equipment.

E. The buildings environmental controls shall be monitored to ensure that the equipment in the communications room is maintained within acceptable operating conditions including, but not limited to, temperature, humidity and dust prevention.

F. A facilities designated communications rooms shall not be used as temporary storage rooms, lunch areas or warehouses. All equipment, floors and work surfaces shall be cleaned regularly and maintained in accordance with industry and manufacturers standards.

G. Agency management or appointed ISO shall ensure agency applications and data comply with State Security Standard 132.

7.0 DEFINITIONS

Communications Room: A communications room is a small room that contains network and telecommunications systems and devices, and physical or virtual servers. It generally provides localized network and data services for the office or building in which it resides, as well as a connection into SilverNet or the agency's Wide Area Network. Communications Rooms are sometimes called Wiring Closets or Telecom Closets.

Data Center: A data center is the principal location that stores, processes and serves large amounts of mission-critical data. The location can including physical and virtual servers, storage subsystems, networking switches, routers and firewalls, as well as the cabling and physical racks used to organize and interconnect the IT equipment. The location must also contain an adequate infrastructure, such as power distribution and supplemental power subsystems, including electrical switching; uninterruptable power supplies; backup generators to include ventilation and cooling systems.

8.0 REFERENCES

National Institute of Standards and Technology (NIST), Special Publications:
800-12, An Introduction to Computer Security; the NIST Handbook, October 1995
800-14, Generally Accepted Principles and Practices for Securing IT Systems, September 1996
800-53, Security and Privacy Controls for Federal Information Systems and Organizations, February 28, 2012

9.0 EXCEPTIONS/OTHER ISSUES

Requests for exception to the requirements of this Information Security Standard must be documented, provided to the Office of Information Security (OIS), and approved by the State Chief Information Security Officer (CISO).

Approved By		
Title	**Signature**	**Date**
State Information Security Committee	Approved by committee	02/22/2018
State Chief Information Security Officer (CISO)	Signature on File	03/19/2018
State Chief Information Officer (CIO)	Signature on File	04/05/2018

Document History		
Revision	**Date**	**Change**
A	7/11/02	Initial release.
B	3/14/12	Renumbering and minor revisions.

State of Nevada

Information Security Committee

Standard

C	1/21/15	Office of Information Security biennial review, replaces standard 4.11
D	2/22/18	Update to include Data Center controls, revision of basic physical security

Change Order Policy

Change Order refers to a formal process for the issuance of Change Orders to the Nevada Shared Radio Replacement Project. The goal of Change Order document is to increase awareness, manage the cost of the Project, understand the proposed changes to the NSRS members, the SERVICE PROVIDER, and team members, and ensure that all changes are made in a thoughtful manner that minimize negative impacts to services and customers.

All changes to the Nevada Shared Radio Replacement Project must follow a structured process to ensure appropriate financial oversight, planning, and execution.

The DEPARTMENT will not issue a Change Order unless:

- A change to the scope is specifically requested by the DEPARTMENT; or
- The change is to the advantage of the DEPARTMENT; or
- The change is a result of something unforeseen at the time of Agreement execution.

NDOT does not expect to make changes except under the circumstances listed above. However, the intent is to allow value engineering recommendations to be proposed.

An effective Change Order process defines the process used to request, review, approve, and enact a change and minimize the resulting impact on the Project. By managing the issuance of Change Orders, the following are intended to be accomplished:

- Reduce the negative impact of changes to the Project
- Identify issues and risks related to proposed changes
- Ensure that changes do not affect the Project's ability to achieve its desired objectives and maintain the Project scope
- Control the cost of changes within the Project.
- Regulate the schedule of the Project.
- Communicate the changes to the DEPARTMENT, the SERVICE PROVIDER, the stakeholders, and the Project Team.

Only those changes to the baseline management of the Project will be subject of Change Orders. That is, changes that affect Project scope, budget, system configuration, design, schedule, and deliverables.

Levels of Change

Limited Change

Limited changes require a completed Change Order and invoke a simple Change Order process. For such changes, planning and approval will be handled entirely by the DEPARTMENT and SERVICE PROVIDER Project managers; and will not involve the Change Advisory Board (CAB).

Limited changes have most or all of the following characteristics:

- A limited or no potential impact on the Project schedule; or
- A limited or no potential impact on the Project budget; or
- A limited or no potential impact on the Project quality; or
- There is a reasonable balance between the level of risk and the cost and resources to implement the change; or
- The Change does not affect other NSRS members.

Moderate Change

Moderate changes require a completed Change Order, approval by the DEPARTMENT and SERVICE PROVIDER Project managers, the implementation rescheduled, if necessary, and will be included in the Post Implementation Review (PIR). Moderate changes will not involve the CAB.

Moderate changes have most or all the following characteristics:

- Has moderate potential impact on the Project schedule; and
- Has a cost impact of less than ten thousand dollars (<$10,000) on the Project budget; and
- Without the change there may be some impact on the Project quality; and
- There is some risk to the Project if the change is/is not implemented; and
- Will require additional NDOT staffing resources; and
- The change will affect other NSRS members.

Major Change

Major changes require a completed Change Order, approval by the DEPARTMENT and SERVICE PROVIDER Project managers and the CAB. The implementation will be scheduled and will be included in the PIR.

Major changes have most or all the following characteristics:

- Has significant potential impact on the Project schedule; and
- Has a cost impact of greater than ten thousand dollars (>$10,000) on the Project budget; and
- Without the change there will be an impact on the Project quality; and
- There is a significant risk to the Project if the change is/is not implemented; and
- Will require additional NDOT staffing resources; and

- The change will affect other NSRS members; and

Roles and Responsibilities

Change Requestor

The change requestor is responsible for identifying the need for a change and completing the Request for Change form (refer to *Addendum A Sample Request for Change Form*), with the relevant information needed for the Project Manager(s) and the Change Advisory Board, to determine if the change should be implemented.

Change Manager

The change manager is responsible for recording the submitted Change Orders on the Change Register (refer to *Addendum B Sample Change Register*), determining the risk classification of each change, updating the status of the Change Orders on the Change Register, scheduling CAB meetings, and updating the Register as necessary.

SERVICE PROVIDER Project Manager

The SERVICE PROVIDER Project Manager is accountable for providing cost estimates, communication to the stakeholders and Project Team regarding change status, risks, impacts, and scheduling, and ensuring that the Change Order process is managed efficiently. The SERVICE PROVIDER will coordinate the implementation of the changes, review implemented changes, produce monthly Change Order Status Reports, perform a post implementation review, and implement improvements to the SERVICE PROVIDER's management of the Change Order process.

The SERVICE PROVIDER Project Manager shall be responsible for maintaining a Budget Sheet (refer to *Addendum C Sample Budget Sheet*), separate from the budget sheets maintained by the DEPARTMENT. The Budget Sheet will maintain current, total expenditures of the project, including change orders.

DEPARTMENT Project Manager

The DEPARTMENT Project manager is responsible for the general oversight of the Change Order process, evaluation of each Change Order for accuracy, receiving and reviewing monthly status reports on Change Orders, and facilitating weekly meetings with the Change Manager and SERVICE PROVIDER Project Manager to review status of Change Orders.

The DEPARTMENT Project Manager shall be responsible for maintaining a Budget Sheet (refer to *Addendum C Sample Budget Sheet*), separate from the budget sheets maintained by the SERVICE PROVIDER. The Budget Sheet will maintain current total expenditures of the project, including change orders.

Change Advisory Board

It is the Change Advisory Board's (CAB) responsibility to assess each Change Order from a business, technical, and financial viewpoint and to make recommendations on the impact, planning, and approval of each Change Order. The CAB membership draws its members from the NSRS Technical Advisory Committee (TAC). CAB meetings for individual changes may be in a teleconference or web-meeting environment; however, a core CAB Team will also meet periodically to review policies and procedures, on-going changes, and the change order backlog.

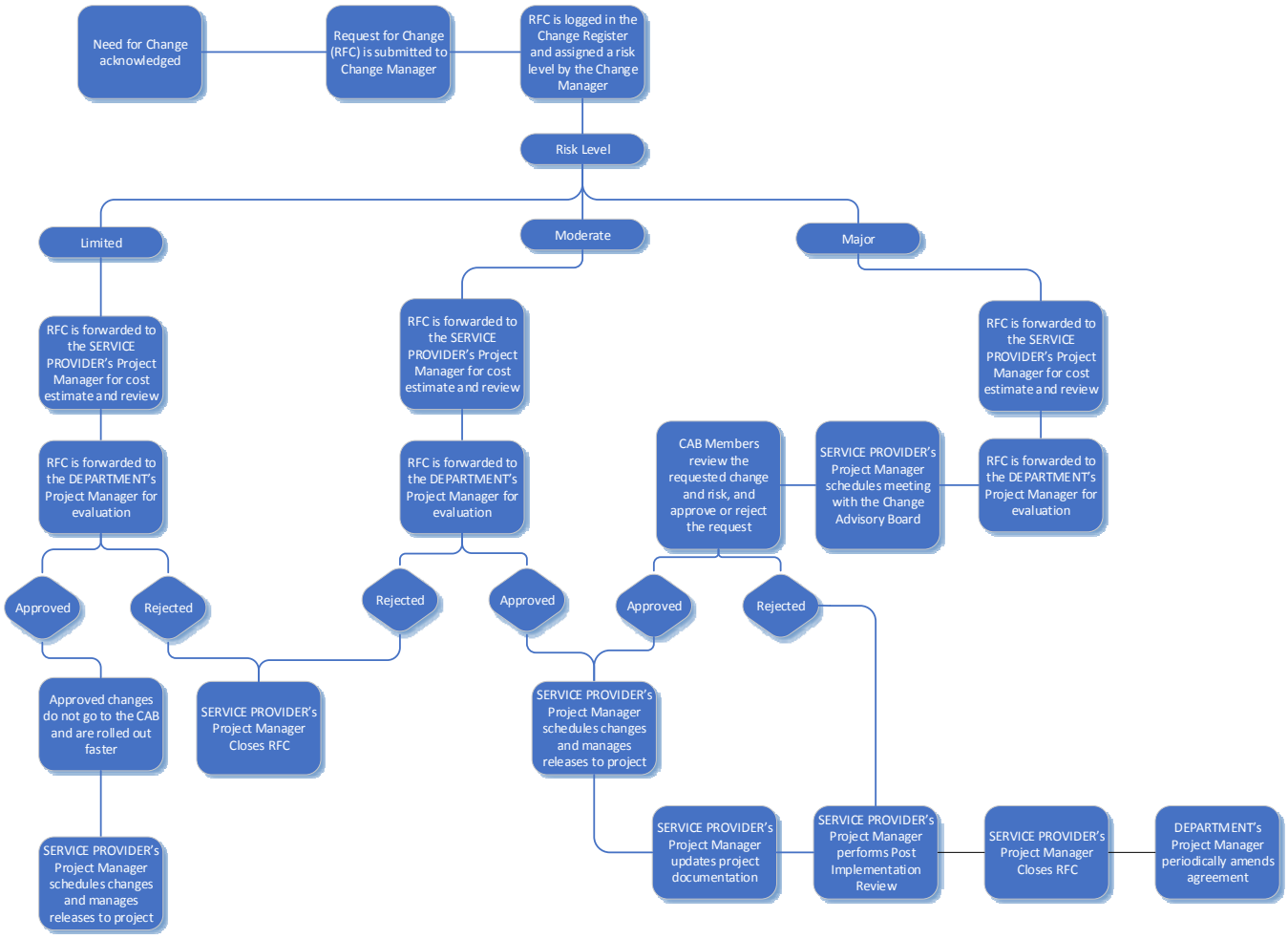
Role	Name
Change Requestor	NSRS members, SERVICE PROVIDER, Project Managers, and Project Team Members.
Change Manager	Richard Martin Federal Engineering
DEPARTMENT Project Manager	Richard Martin Federal Engineering
SERVICE PROVIDER Project Manager	Phil Roland Harris Project Manager
Change Advisory Board	Jim Whalen, NDOT Shawn Tayler, Washoe County Lee Onsager, NV Energy

Change Order Process

The Change Order Process is made up of the following steps:

1. Identify Need for Change
2. Create and record the Request for Change Form
3. Review the Request for Change Form
4. Evaluate the requested Change Order
5. Approve/authorize the Change Order
6. Coordinate Implementation of the Change Order
7. Update the associated Project documentation
8. Review and close the Change Order

The figure below depicts the work flow required to identify, document, review, evaluate, approve, and implement Change Order for the Project.



Identify Need for Change

The first step in the Change Order process is to identify the need for a change. NSRS members, Project Managers, team members, SERVICE PROVIDER and others working on the Project may suggest a change.

After identifying a need for change, the requestor records relevant information on a Request for Change Form. This relevant information is made up of the change description along with identifying impetus, benefits, potential cost benefits, if known, and the potential impact of the change on the Project. The requestor then forwards the Change Order to the Change Manager for review.

Create and Record the Request for Change

A Request for Change is created by any individual involved in the Project by completing a Request for Change Form.

The Request for Change Form will contain the relevant information necessary to make informed decisions concerning the authorization and implementation of a Change Order, including identifying

information, a description, configuration item incurring the change, a reason for the change, type of change, scheduling, costs, back-out plan, risks, benefits, and justification. The Request for Change Form is submitted to the Change Manager.

The Change Manager will record the Change Order on a Change Register and track the Change Order throughout the Project. The Change Register will be updated by the Change Manager for each Change Order as it moves through the Change Order Process.

Each Change Order will be reviewed and prioritized by the Change Manager for business practicality. The Change Order may be rejected and returned to the submitter as notification of its acceptance or rejection; or return the Change Order to the submitter to request more detail. These unapproved Change Orders must be monitored and closed, as needed.

The Change Manager will forward the Change Order to the SERVICE PROVIDER's Project Manager.

Review and Estimate the Change

The SERVICE PROVIDER's Project manager reviews all Change Orders for validity, provides a cost estimate, assesses the impact, checks for implementation and back out plans, and ensures collaboration with the team that the change can occur. Upon completion of the Change Order, a Post Implementation Review (PIR), is performed for moderate and major changes. The PIR will be submitted to the DEPARTMENT Project Manager and the Change Manager within thirty (30) days of the Change Order being closed.

Evaluate the Change

The DEPARTMENT's Project Manager evaluates the presented Change Order to determine the basis for the requested change, the impact of the requested change to the Project, and the importance of the requested change to the successful delivery of the Project. Changes which are not critical to Project delivery are to be avoided whenever possible to prevent scope creep. A decision determining that the scope must be changed can only be made if the Change Order posed is that of a Major Change and must go to the Change Advisory Board for approval.

Evaluating the change to assess the impact, risk, and benefits to the Project is critical to avoid unnecessary disruption to business operations. Impact assessment will consider the impact on the business, infrastructure, customer service, other services, implementation resources, and currently scheduled changes in the Change Register. For major risks, the Change Advisory Board (CAB) will also evaluate changes. The SERVICE PROVIDER will offer its insight into the effects of the change to the Project.

Approve Change

If the change is deemed critical to Project success, the DEPARTMENT Project Manager approves the request for the Change Order and, when necessary, forwards the Change Order to the Change Advisory Board for approval. Based on the level of risk, impact, benefits, and cost to the Project, the decision may be to decline, delay or approve the change request.

Cost of the Change

The cost of the Change Order will be recorded on Change Register by the Change Manager.

Coordinate Implementation

If the change is approved, the SERVICE PROVIDER's Project Manager will schedule and coordinate the implementation accordingly. After implementing the change, the SERVICE PROVIDER's Project Manager reviews the effects of the change on the Project to assure that it achieved the desired outcome and reports the results of his/her review to the Change Manager. The Change Manager will close the Change Order in the Change Register.

The SERVICE PROVIDER's Project Manager will schedule each Change Order based on the business risk and any implementation requirements. The SERVICE PROVIDER's Project Manager will communicate to the NSRS members and Project team members of upcoming changes, regardless of the severity of the change's impact to the Project. The change communication, along with Projected service outages, or expected deviations in service availability, will be taken into consideration when coordinating Change Order implementation. The SERVICE PROVIDER will be responsible for coordinating the implementation and coordination of the necessary training associated with the Change Order.

The SERVICE PROVIDER's Project Manager is responsible to update all Project documentation that is affected by the Change Order and assure that the update documents are available to the Project team members.

Review and Close the Request for Change

Upon completion of the Change Order, a Post Implementation Review (PIR) will be conducted, which provides a review of the detailed implementation results, and confirms the change has successfully achieved its objective. The PIR is performed for moderate and major changes and will be submitted to the DEPARTMENT Project Manager and the Change Manager within thirty (30) days of the Change Order being closed.

If successfully implemented, and the Change Order was associated with correcting an error in service, all associated problems and known errors shall be closed. If not successful, a remediation plan will be activated appropriately.

Definitions

Baseline – The approved version of a work product that can be changed only through the formal Change Order procedures and is used as a basis for comparison and the starting point of a Project.

Budget Sheet - Auditable spreadsheet of project costs.

Change - The addition, modification or removal of approved, supported or baselined hardware, network, software, application, environment, system, infrastructure, or associated documentation.

Change Advisory Board - One staff member from each of the three (3) NSRS membership agencies that support the assessment, prioritization, authorization, and scheduling of Change Orders.

Change Register - Auditable log of who, what, why, when, and how for all changes.

Change Order - Process of controlling changes to the infrastructure or any aspect of services to enable completion of approved changes with minimum disruption.

Request for Change From - the document initiated by a RFC that is used to capture the details of an approved change to the Project.

Impact – Determine, prior to implementing a change, the estimated amount of disruption to users, budget, quality and/or schedule that a requested Change Order will have on the Project.

NSRS members – Nevada Department of Transportation, NV Energy, and Washoe County and/or the staff which represents these entities.

Post Implementation Review (PIR) - Upon completion of the change, a Post Implementation Review, is performed for moderate and major changes. The PIR will be submitted to the DEPARTMENT Project Manager and the Change Manager within thirty (30) days of the Change Order being closed.

Request for Change Order – A formal proposal for a change to be made to the Project. It includes details for the proposed change.

Service – A means of delivering value to customers by facilitating those outcomes the customers want to achieve without the ownership of specific costs and risks.

Change Order Status Reports – A monthly report that includes the status of all Change Orders.

ADDENDUM A

SAMPLE Request for Change

Change Order Number _____

Date _____

Risk Level: Limited ☐ Moderate ☐ Major ☐

1. **Overview of change order and justification:**

To be completed by the submitter

2. **Detail change description:**

To be completed by the submitter

3. **Estimated Cost and Schedule Impact of Change (including additions and deletions of work):**

To be completed by the SERVICE PROVIDER

4. **Risks:**

To be completed by the SERVICE PROVIDER

5. **Approvers:**

Name	Signature	Title
		SERVICE PROVIDER Program Manager
		DEPARTMENT Program Manager
		Change Authority Board Member
		Change Authority Board Member
		Change Authority Board Member

Prepared by: Date Submitted

Notes:

ADDENDUM B

SAMPLE Change Register

Project Name:
Project Manager:

Change Register for Nevada Shared Radio Replacement Project

ID	Date	Submitted By	Description of Change	Impact Rating Standard/Minor/Major	SERVICE PROVIDER Approval Date	DEPARTMENT Proj Mgr Approval Date	CAB Approval Date if applicable	Implementation Date	Cost of Change

ADDENDUM C

SAMPLE Budget Sheet

7/13/2018

Sample Budget Sheet

Nevada Shared Radio Replacement Project

Total Agreement Cost:	$1,000,000	Remaining Project Budget:	$964,000
Contingency Fund:	$100,000	Remaining Contingency Fund:	$64,000
Agreement Cost + Contingency:	$1,100,000	Total Spent-to-Date:	$46,500

Deliverable	Invoice Number	Invoice Date	Budgeted Amount	Invoice Amount
Complete Design Plan	1234	6/3/2018	$16,000	$16,000
Complete Site Plans	1245	7/1/2018	$12,400	$12,400
Preliminary Site Visits	1303	7/12/2018	$7,600	$7,600
Region 0 Build			$150,000	
Region 0 Testing			$50,000	
Region 0 Deployment			$41,000	
Region 1 Build			$150,000	
Region 1 Testing			$50,000	
Region 1 Deployment			$41,000	
Region 2 Build			$150,000	
Region 2 Testing			$50,000	
Region 2 Deployment			$41,000	
Region 3 Build			$150,000	
Region 3 Testing			$50,000	
Region 3 Deployment			$41,000	
			$1,000,000	$36,000

Change Order Number and Description	Invoice Number	Invoice Date	Estimate Amount	Invoice Amount
001 Change location of undeveloped site #43 - update Design Plan and drawings	1310	7/4/2018	$500.00	$500.00
002 Change color of paint on buildings from brown to blue	1315	7/5/2018	no charge	no charge

003	Add additional generator to 5 sites	1387	7/12/2018	$10,000.00	$10,000.00
004	Increase training to include 2 additional 8-hour sessions			$8,000.00	
005					
				$18,500.00	$10,500.00