STAFF REPORT FOR THE PLANNING COMMISSION MEETING OF JANUARY 26, 2022

FILE NO: LU-2021-0452 **AGENDA ITEM: 6.D**

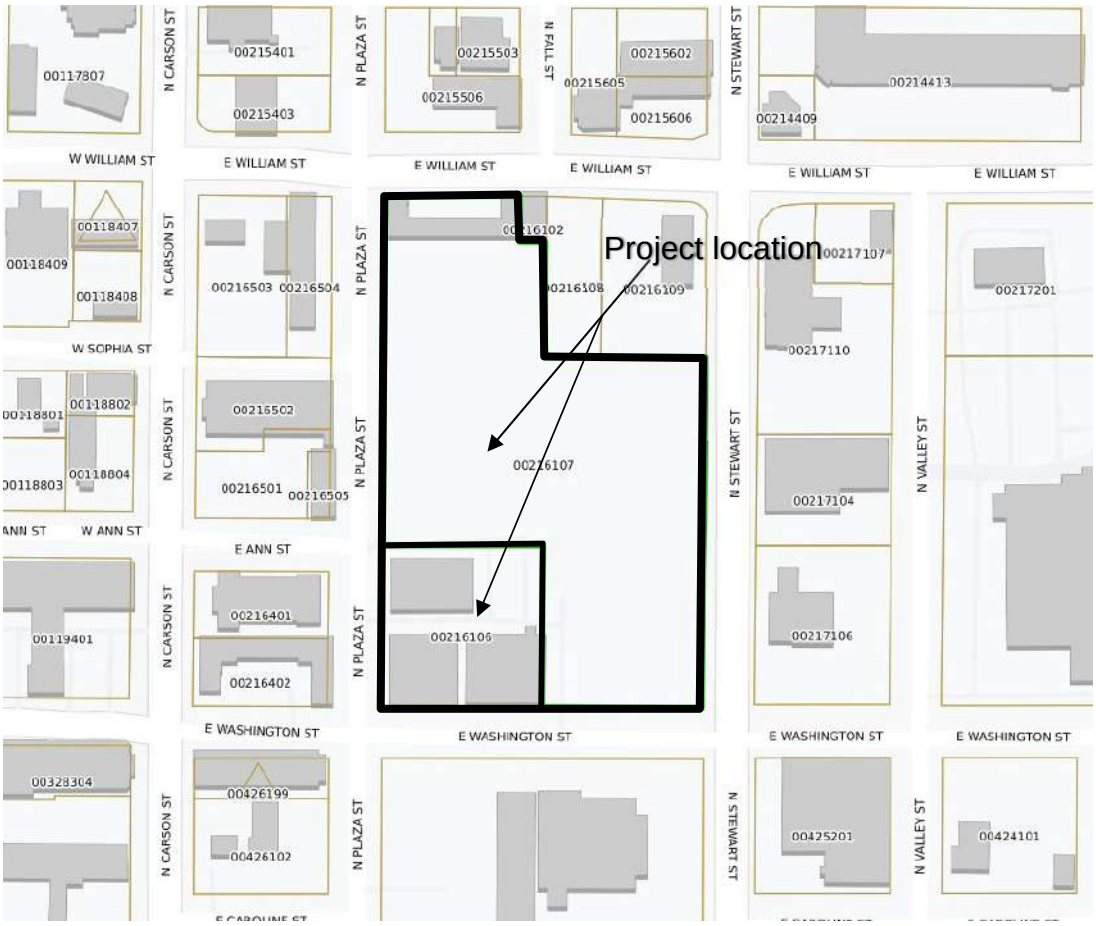
STAFF CONTACT: Heather Ferris, Planning Manager

AGENDA TITLE: For Possible Action: Discussion and possible action regarding a request for a special use permit ("SUP") to allow alternative compliance of the Downtown Mixed Use Standards, specifically standards related to the mixed use, sidewalk, window transparency, and building envelope step-back requirements relative to a multi-family residential development on property zoned Downtown Mixed Use ("DT-MU"), located at 201 E. William Street and 222 E. Washington Street, APNs 002-161-06 and 002-161-07. (Heather Ferris, hferris@carson.org).

STAFF SUMMARY: The applicant is proposing to construct a 207-unit apartment complex known as The Altair. As the property is located in the Downtown Mixed Use zoning district, development must meet the standards identified in Division 6 of the Development Standards. Alternatively, per CCMC 18.07.025, the applicant may seek a special use permit to allow for alternative compliance. The Planning Commission is authorized to approve a special use permit.

RECOMMENDED MOTION: "I move to approve LU-2020-0452, based on the findings and subject to the conditions of approval contained in the staff report."

VICINITY MAP:



RECOMMENDED CONDITIONS OF APPROVAL:

1. The applicant must sign and return the Notice of Decision for conditions of approval within 10 days of receipt of notification. If the Notice of Decision is not signed and returned within 10 days, then the item may be rescheduled for the next Planning Commission meeting for further consideration.

2. All development shall be substantially in accordance with the development plans approved with this application, except as otherwise modified by these conditions of approval.

3. All on and off-site improvements shall conform to city standards and requirements.

4. The use for which this permit is approved shall commence within 12 months of the date of final approval. A single, one year extension of time may be requested in writing to the Planning Division thirty days prior to the one-year expiration date. Should this permit not be initiated (obtain a Building Permit) within one year and no extension granted, the permit shall become null and void.

5. This approval does not include the approval of any signs. Any proposed signs will require a sign application and must meet the downtown development standards.

6. A detailed lighting plan, including cut sheets, is required at the time of building permit application to ensure compliance with the downtown design standards.

7. All utility and mechanical equipment must be screened.

8. At the time of building permit application, the applicant shall demonstrate that 35 percent of the building at the pedestrian level includes window openings consistent with Carson City Development Standards 6.6.10.4.

9. Trash enclosures provided on-site must meet the specification in Division 1 of the Carson City Development Standards.

10. Prior to issuance of any construction permit, the applicant shall demonstrate compliance with the HRC approvals dated September 9, 2021 and October 14, 2021.

11. The water main that is proposed to bisect the property must be privately owned and operated.

12. The project must meet all Carson City Development Standards and Standard Details including but not limited to the following:
    a. The traffic impact study must be updated to the satisfaction of the transportation manager.
    b. New 8-inch water mains must be extended along the frontage of the project on Plaza Street where no mains exist, and the entirety of the frontage on Washington Street.
    c. The water main that bisects the property must be isolated with reduced pressure principal assembly backflow preventers on either side. Mains with only fire hydrants may be isolated with single check valves to maintain pressures.
    d. Any existing segments of water or sewer main on the property which are not to be used, must be properly abandoned.
    e. The water main analysis must be updated to show that required flow and pressure

can be delivered for fire flow during peak demand. Losses from backflow preventers must also be accounted for.

f. The underground detention system must be privately owned and operated and must be accessible for maintenance.
g. Trees must be located at least 10 feet from water and sewer lines.
h. Low impact design features must be incorporated into the stormwater design.
i. Storm drains shall be a minimum of 15 inches in diameter.
j. A sewer main easement must be provided for the 12-inch PVC main which bisects the property from West Sophia Street to North Stewart Street. This easement must be 20 feet wide plus any additional width needed for benching excavations, depending on sewer depth.

LEGAL REQUIREMENTS: CCMC 18.02.080 (Special Use Permits), CCMC 18.04.125 (Downtown Mixed-Use DT-MU); Development Standards Division 6 (Downtown Mixed-Use District)

MASTER PLAN DESIGNATION: Downtown Mixed-Use

ZONING DISTRICT: Downtown Mixed-Use District

KEY ISSUES: Will the alternative compliance be consistent with the downtown character, incorporated into a broader mix of uses, and consistent with the master plan policies for downtown?

SURROUNDING ZONING AND LAND USE INFORMATION:
NORTH: Downtown Mixed-Use and General Commercial / E. William Street & service garage
EAST: Downtown Mixed-Use / Bank, retail, office, warehouse, & church
WEST: Downtown Mixed-Use & Public Community / service garage, motel, office, & museum
SOUTH: Public Regional/ government building

ENVIRONMENTAL INFORMATION:
FLOOD ZONE: Zone X shaded
EARTHQUAKE FAULT: Within 500 feet; zone II (Moderate Severity)
SLOPE/DRAINAGE: generally flat

SITE DEVELOPMENT INFORMATION:
NUMBER OF UNITS: 207 units
LOT SIZE: 4.93 acres
PARKING: 253 parking spaces

PREVIOUS REVIEWS:

HRC-2021-0312: September 9, 2021 the Historic Resources Commission reviewed and approved the 207-unit multi-family project finding that the proposal is in conformance with the Secretary of the Interior Guidelines and Standards for Rehabilitation, Carson City Historic District Guidelines, and Historic Resources Commission policies.

MPR-2021-0236: July 20, 2021 a Major Project Review for a 207- unit multi-family project was completed.

MPR-18-036: March 6, 2018 a Major Project Review for a 250-unit multi-family project was completed.

V-87/88-2: December 3, 1987 a variance from the number of on-site parking spaces was approved

for the proposed rehabilitation and conversion of V&T Engine House building into retail shops and a bed and breakfast.

U-83-13: April 28, 1983 a Special Use Permit for conversion of existing motel operations to monthly rentals with cooking facilities was approved on APN 002-161-07.

DISCUSSION:
The subject property is comprised of two parcels totaling 4.93 acres. Both properties are zoned Downtown Mixed-Use (DT-MU), and both are designated as Urban Mixed-Use within the DT-MU district. The project site fronts on E. Williams Street and N. Stewart Street, both minor arterials, and N. Plaza Street and E. Washington Street, both local roads.

The larger of the two parcels, APN 002-161-07, is also located in the Historic District. The subject property was the site of the Virginia and Truckee Railroad roundhouse complex constructed by Abe Curry in 1872-73. The facility closed in 1950 after over 80 years of operation. It was sold in 1955 and used for several years as an automotive testing center until it was vacated in the 1970s. The buildings were demolished in 1991. As a result of a lot line deletion recorded in 1990, the parcel is currently the site of a strip of retail stores fronting E William Street, constructed in the late 1950s.

The applicant is proposing the construction of a 42-foot-tall apartment complex with a maximum of 207 residential units (7 studios, 121 one-bedroom, and 79 two-bedroom) and 253 parking spaces (a combination of garage and surface parking). The project will include a total of 5 buildings each 3 stories in height with a loft level, a clubhouse, fitness center, swimming pool, outdoor seating areas, barbeques, fire pits, and walking paths. The existing 4,069 square foot retail use fronting E. William Street (APN 002-161-07) will be demolished.

Multi-Family Dwellings are an allowed use in the DT-MU and must be designed and constructed consist with Division 6 of the Development Standards. Per CCMC 18.07.025, alternative compliance may be approved subject to a Special Use Permit and three additional findings. The Planning Commission is authorized to approve a Special Use Permit.

The applicant is requesting alternative compliance for the following four items.

<u>6.5.3 Mix of Uses</u>
Sites greater than 50,000 square feet shall include at least one use from the commercial / service / retail use group as identified in the table in Division 6.

The applicant proposes an entirely residential use.

<u>6.6.7.3.a Streetscape</u>

a. Prior to the completion of the city's downtown streetscape plan, and for all other properties not addressed within the completed downtown streetscape plan, streetscape shall be provided along all street frontages as follows:
(1). Residential Character: Minimum - foot-wide planter area in combination with minimum 8-foot sidewalk; or
(2) Urban Character: Minimum 15-foot sidewalk with street trees in grates.

As the development is on a commercial corridor as opposed to a residential street, a 15-foot sidewalk with street trees should be provided. The applicant is proposing an 8-foot wide sidewalk along N. Stewart Street and N. Plaza Street with a 5-foot planting area between the sidewalk and

the street and an additional planting strip between the sidewalk and the building. A 10-foot sidewalk is proposed along E. William Street with a 9-foot planting area between the building and the sidewalk; and a 10-foot sidewalk with a planting area on both sides of the sidewalk is proposed along E. Washington Street.

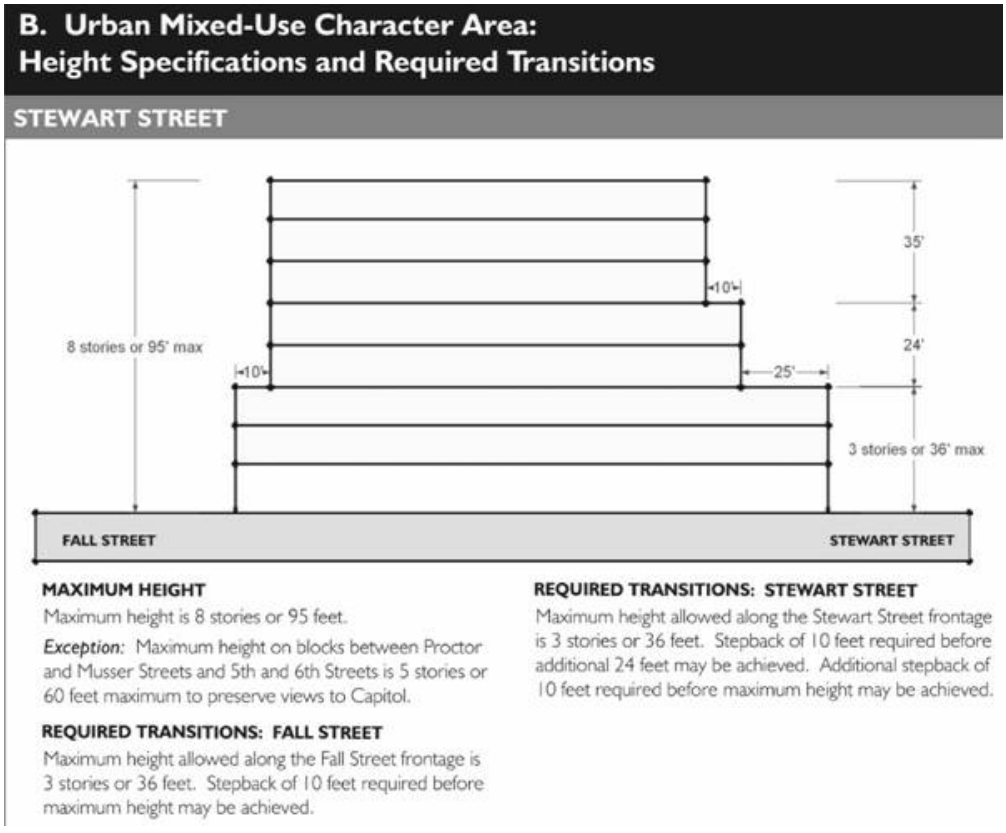
6.6.10.4.2.b Street Level Interest/Transparency

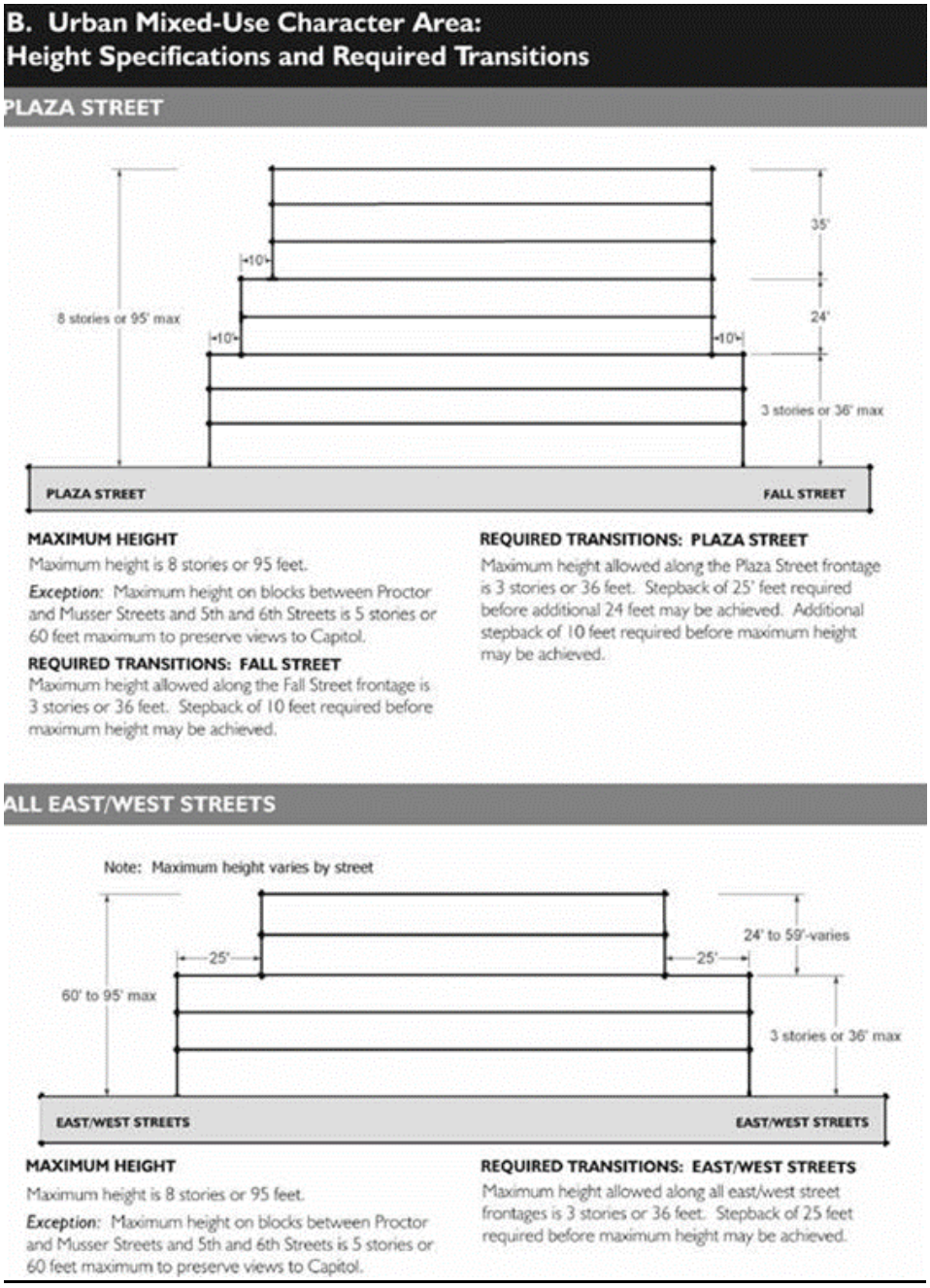
a. A minimum percentage of the total area of each ground floor building façade which faces a street, plaza, park, or other public space, shall be comprised of transparent window openings to allow views of interior spaces and merchandise, to enhance the safety of public spaces by providing direct visibility to the street, and to create a more inviting environment for pedestrians. Minimum percentages vary according to character area and use as follows:

(1) Main Street Mixed-Use Character Area: 50 percent minimum.
(2) Urban Mixed-Use Character Area:
    (a) Non-Residential Uses: 50 percent minimum;
    (b) Residential Uses: 35 percent minimum.
(3) Neighborhood Transition Character Area:
    (a) Non-Residential Uses: 40 percent minimum;
    (b) Residential Uses: 30 percent minimum.

As the development is proposed to be entirely residential, the applicant is requesting compliance with the residential character which requires 35% transparency. For residential uses glazing on ground floor windows shall be transparent to allow views into common hallways, foyers, or entryways, but may be translucent or opaque when necessary to protect the privacy of ground-floor spaces used for dwelling purposes.

6.7 Street Envelope Standards





As shown in the above graphic, after three stories, the building should "step back" 25 feet along the north and south streets and 10 feet from the east and west streets. The applicant is proposing a design that provides a stepback of at least 10 feet at each loft and up to 23.5 feet some instances. The design meets the required stepback on Plaza Street but does not meet the stepback at Williams, Stewart or Washington Streets. The applicant is proposing a minimum stepback of 10 feet along these streets.

PUBLIC COMMENTS: Public notices were mailed to 78 property owners within 600 feet of the subject site on January 11, 2022. As of the writing of this report, no comments have been received. Any comments that are received after this report is completed will be submitted prior to or at the Planning Commission meeting, depending on the submittal date to the Planning Division.

OTHER CITY DEPARTMENTS OR OUTSIDE AGENCY COMMENTS: The following comments were received by various city departments. Recommendations have been incorporated into the recommended conditions of approval, where applicable.

Development Engineering:

Development Engineering has no preference or objection to the special use request provided that the following conditions are met:

- The water main that is proposed to bisect the property must be privately owned and operated.
- The project must meet all Carson City Development Standards and Standard Details including but not limited to the following:
    - The traffic impact study must be updated to the satisfaction of the transportation manager.
    - New 8-inch water mains must be extended along the frontage of the project on Plaza Street where no mains exist, and the entirety of the frontage on Washington Street.
    - The water main that bisects the property must be isolated with reduced pressure principal assembly backflow preventers on either side. Mains with only fire hydrants may be isolated with single check valves to maintain pressures.
    - Any segments of water or sewer main on the property which are not to be used, must be properly abandoned.
    - The water main analysis must be updated to show that required flow and pressure can be delivered for fire flow during peak demand. Losses from backflow preventers must also be accounted for.
    - The underground detention system must be privately owned and operated and must be accessible for maintenance.
    - Trees must be located at least 10 feet from water and sewer lines.
    - Low impact design features must be incorporated into the stormwater design.
    - Storm drains shall be a minimum of 15 inches in diameter.
    - A sewer main easement must be provided for the 12-inch PVC main which bisects the property from West Sophia Street to North Stewart Street. This easement must be 20 feet wide plus any additional width needed for benching excavations, depending on sewer depth.

Development Engineering has reviewed the application within our areas of purview relative to adopted standards and practices and to the provisions of CCMC 18.02.080, Conditional Uses. Development Engineering offers the following discussion:

CCMC 18.02.080(5)(a) - Master Plan
The request is not in conflict with any Engineering Master Plans.

CCMC 18.02.080(5)(b) – Use, Peaceful Enjoyment, Economic Value, Compatibility
Development Engineering has no comment on this finding.

CCMC 18.02.080(5)(c) - Traffic/Pedestrians
The requested waivers will have a negligible impact to vehicular and pedestrian traffic. The traffic impact analysis will be updated to the satisfaction of the transportation manager and any necessary mitigation will be included in the project design, prior to a construction permit being issued.

CCMC 18.02.080(5)(d) - Public Services
The requested waivers will have a negligible impact to sanitary sewer, domestic water, and stormwater demand. The water main and storm drainage analyses will be updated to the

satisfaction of Development Engineering and any necessary mitigation will be included in the project design, prior to a construction permit being issued. The sewer main analysis is adequate to determine that there will be no detrimental impact to the sanitary sewer system. The applicant may elect to install privately owned and operated booster pumps to increase pressures on the upper stories of the facility.

CCMC 18.02.080(5)(e) – Title 18 Standards
Development Engineering has no comment on this finding.

CCMC 18.02.080(5)(f) – Public health, Safety, Convenience, and Welfare
The project meets will meet engineering standards for health and safety if conditions are met.
Earthquake faults: The closest fault is approximately 230 feet away with a slip rate of less than 0.2 mm/yr.
FEMA flood zones: The FEMA flood zone is Zone X (shaded) so no special flood mitigation is required.
Site slope: The site is currently developed so the slope is minimal.

CCMC 18.02.080(5)(g) – Material Damage or Prejudice to Other Property
Development Engineering has no comment on this finding.

CCMC 18.02.080(5)(h) – Adequate Information
The plans and reports provided were adequate for this analysis.

Fire Department:

1. Project must comply with the International Fire Code and northern Nevada fire code amendments as adopted by Carson City.

Environmental Control

1. An asbestos assessment is required on all applicable materials being demolished on APN 00216106 & 00216107, per CCMC 12.12.065 and 40 CFR Part 61.

2. After receiving results back from the asbestos assessment, complete Carson City's Acknowledgement of Asbestos Assessment Form. Submit a copy of this form along with a copy of the asbestos assessment at the Carson City Building Department, per CCMC 12.12.065.

3. EPA requires a NESHAP 10 Day Notification on a complete demolition of a commercial property, regardless of whether asbestos is detected during the assessment. Submit a completed copy of this document to the Carson City Building Department along with proof that the Notification was sent to EPA Region IX, per CCMC 12.12.065.

4. Please note: if any asbestos containing material is to be taken to the Carson City Landfill for disposal, an Industrial Waste Manifest must be obtained from the ECA Department before this material will be allowed to enter the landfill, per CCMC 12.12.050. If any asbestos containing material is to be taken to the Lockwood Landfill for disposal, Carson City's Environmental Control Authority (ECA) will require a copy of the receipt issued from Lockwood to be submitted to the Carson City Building Department.

5. Provide details of best management practices in place to prevent oil or grease reaching the storm sewer or sanitary sewer in the event of flooding or mechanical failure of hydraulic elevators, per CCMC 12.19.080 and 12.06.410.

6. A properly sized grease interceptor may be required dependent on the level of food service anticipated at the clubhouse, per CCMC 12.06.245.

These comments are based on a very general site plan and do not indicate a complete review. All pertinent requirements of Federal Code, Nevada State Law, Carson City Municipal Code, and Carson City Development Standards will still apply whether mentioned in this letter or not.

FINDINGS: Staff's recommendation is based upon the findings as required by CCMC Section 18.02.080 (Special Use Permits) with the supplemental findings identified in 6.5.2 of the Development Standards as enumerated below and substantiated in the public record for the project.

1. *Will be consistent with the objectives of the Master Plan elements.*

The project site is designated Downtown Mixed-Use. The purpose of the designation is to recognize downtown as the most intense activity center and the "heart" of the community. The DTMU designation is intended to allow for and encourage a broader mix of uses than exist today in Downtown, while respecting its historic context and creating an inviting, pedestrian-friendly environment.

The DTMU designation is provided specifically for the City's historic Downtown area, with a series of smaller "character areas." The subject property is in the Urban Mixed-Use area. The purpose of the urban mixed-use character area is to provide for urban intensity mixed-use development in areas of downtown that contain larger tracts of vacant or underutilized land. It is intended to provide opportunities for concentrations of active uses such as convention space, casinos, hotels, urban residential or similar uses which typically have more intensive land requirements than could be readily accommodated in other areas of downtown. To support these objectives, building heights in this area are permitted to be higher than in other character areas within downtown, provided appropriate transitions are provided to the more modest scale of development found along Carson Street, the surrounding neighborhoods, and the State Capitol complex.

Goal 5.6 of the Master Plan is to Promote Downtown Revitalization.

Developing the subject property as entirely residential is consistent with the objective of the Urban Mixed-Use area in that there is commercial spaces and government buildings surrounding the property. Realistically, given the location of the site adjacent to commercial uses, the urban scale residential development will complement these existing uses, creating a mixed-use node.

The sidewalk and street level interest/transparency requirements are part of creating an inviting, pedestrian friendly environment. The applicant is proposing an 8-foot sidewalk along N. Plaza and N. Stewart with a landscape strip between the sidewalk and the street. Along E. Washington, the applicant will be providing a 10-foot sidewalk with a landscape strip between the street and the sidewalk. Along E. William Street a 10-foot sidewalk will be provided with a 9-foot landscape strip between the sidewalk and the building. The proposed sidewalk width is consistent with the requirements for a project with the residential character within the DT-MU zoning district. Staff finds, with the elimination of the requirement for a mix of uses, as outlined above, the reduced sidewalk width is appropriate. The applicant has also requested compliance with the residential character for street level interest/transparency. The applicant is proposing a strictly residential use and will be providing only one small public park area along N. Stewart. As designed, the park will be completely visible from the street. Staff finds that providing transparency consistent with the residential character requirements is consistent with the master plan.

The applicant is proposing a 3-story building with some units having a loft area, with a minimum of step back of 10 feet. The step back is part of creating an inviting, pedestrian friendly environment in that it allows for sunshine to reach sidewalks and outdoor areas and avoids a constant shadow. In this case, the site is designed with a 19-foot setback as well as a minimum of a 10-foot step back above 36 feet, providing for a more open pedestrian friendly environment. Given this design, the sidewalk will receive sunshine. Therefore, staff finds that the reduced step back will be consistent with the Master Plan.

2. ***Will not be detrimental to the use, peaceful enjoyment, economic value, or development of surrounding properties or the general neighborhood; and is compatible with and preserves the character and integrity of adjacent development and neighborhoods or includes improvements or modifications either on-site or within the public right-of-way to mitigate development related to adverse impacts such as noise, vibrations, fumes, odors, dust, glare or physical activity.***

The proposed alternative compliance requests will not be detrimental to surrounding properties or the general neighborhood. The exclusively residential use will place customers near existing commercial uses and jobs in the downtown.

The request for relief from the mixed use requirement, a reduced sidewalk width, compliance with the residential character transparency requirement, and a reduced step-back will not create adverse impacts such as noise, vibrations, fumes, odors, dust, glare or physical activity.

3. ***Will have little or no detrimental effect on vehicular or pedestrian traffic.***

The Special Use Permit is for the alternative compliance of a single residential use as opposed to mixed use, sidewalk widths that are not per the development standards, street level interest/ transparency consistent with the residential character, and a reduced building step back. The requested waivers will have a negligible impact to vehicular and pedestrian traffic. The traffic impact analysis will be updated to the satisfaction of the transportation manager and any necessary mitigation will be included in the project design, prior to a construction permit being issued.

Subject to the recommended conditions of approval, the proposed improvements and existing infrastructure is sufficient for safe and efficient pedestrian and vehicular travel.

4. ***Will not overburden existing public services and facilities, including schools, police and fire protection, water, sanitary sewer, public roads, storm drainage, and other public improvements.***

The proposed alternative compliance request will not overburden public services and facilities. Of note multi-family residential is an allowed use in the DTMU. It is the requested alternative compliance that is being reviewed.

The requested waivers will have a negligible impact to sanitary sewer, domestic water, and stormwater demand. The water main and storm drainage analyses will be updated to the satisfaction of Development Engineering and any necessary mitigation will be included in the project design, prior to a construction permit being issued. The sewer main analysis is adequate to determine that there will be no detrimental impact to the sanitary sewer system. The applicant may elect to install privately owned and operated booster pumps to increase pressures on the upper stories of the facility.

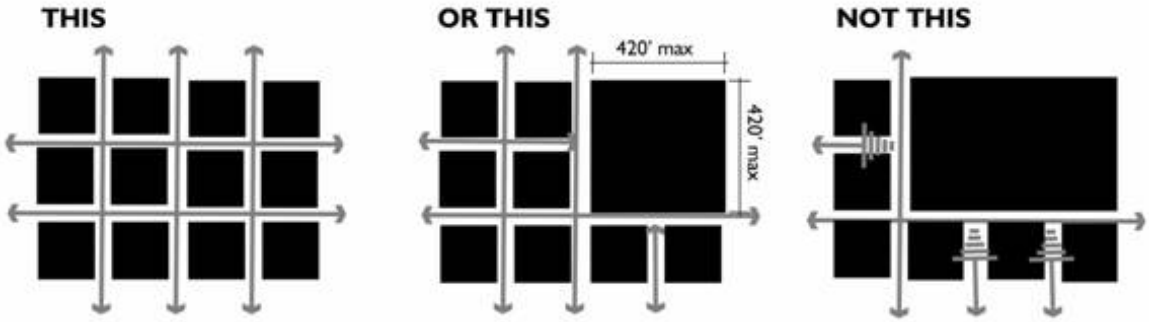
As noted above, a multi-family residential use is an allowed use in the DT-MU zoning district. The school district, Sheriff's Office, and Fire Department already provided services.

5. *Meets the definition and specific standards set forth elsewhere in this Title for such particular use and meets the purpose statement of that district.*

Section 6.6 of the Development Standards provides for the general development standards and guidelines in the Downtown Mixed-Use District. These standards are as follows.

6.6.1 Vehicular and Pedestrian Connections.

1. *Intent.*
   a. *To maintain a well-defined pattern of urban blocks within downtown that provide frequent connections to adjacent neighborhoods and serve as a framework for a varied mix of uses.*
   b. *To maintain frequent pedestrian connections that reflect Carson City's traditional pattern of blocks while allowing for the incorporation of some larger developments and outdoor plazas that require the consolidation of 2 or more blocks, where appropriate.*
2. *Block Size.*
   a. *To the maximum extent feasible, new development shall work within the framework of downtown's existing pattern of blocks to avoid interrupting the grid pattern, creating large "superblocks," and limiting access to adjacent neighborhoods.*
   b. *Maximum block lengths resulting from block consolidation shall be limited to 420 feet.*
   c. *Where block consolidation is proposed (by right-of-way abandonment), special consideration shall be given to vehicular circulation patterns, flood/drainage pathways, and view corridors to significant features in the area, such as the Capitol building and the mountains to the west.*



STAFF RESPONSE: The proposed development will not involve any modification to the shape or size of the block.

6.6.2 Lighting.

1. *Intent.*
   a. *To encourage a safe, appealing, and pedestrian-friendly nighttime environment within downtown core.*
   b. *To promote the retention of the downtown core's unique nighttime character, as provided by its numerous lighted marques and animated lights.*
   c. *To ensure that new lighting is compatible with the established character of the downtown and the surrounding neighborhoods.*
2. *Exterior Lighting.*
   a. *Low-scale, decorative lighting shall be used to accent architectural details, building entries, or signs. Additional, pedestrian-scaled lighting shall be provided to illuminate sidewalks, enhancing security and extending hours of activity.*
   b. *All light sources shall be shielded to protect the city's dark skies and prevent spillover into*

adjacent residential neighborhoods and the city's downtown.

c. Lighted marques and animated lighting, such as chase lights, exist in many locations within downtown and are reflective of the city's gaming traditions. Generally, this type of lighting should be limited to that which exists today; however, new lights may be approved by the director or designee on a project-by-project basis.

d. Building façade accent lighting is limited to an upward angle of 45 degrees and must be focused on the building to minimize light trespass onto adjacent properties and into the sky.

3. Storefront Lighting. The incorporation of interior window lighting to highlight displays is strongly encouraged to provide off-hour interest along Carson Street.

4. Street Lights. All street lights, whether intended for pedestrian or auto-oriented purposes, shall be consistent with the city's downtown streetscape plan.

STAFF RESPONSE: Consistent with the guidelines, all lighting will be shielded to protect the dark skies. Decorative lighting will be used to accent architectural details, building entries and signs. The applicant proposes to utilize the downtown streetlights. Staff has included a condition of approval requiring that details of the proposed lighting fixtures are required to be submitted with the building permit application and will be reviewed for compliance with the downtown development standards.

6.6.3 Signage.

1. Intent.

a. To encourage a diverse and visually interesting streetscape environment along Carson Street by allowing a variety of types of business signage, as traditionally found; and

b. To ensure that signage is compatible with the pedestrian-oriented scale of downtown.

2. General.

a. All standards contained in this subsection shall be applied in addition to signage regulations contained in Division 4 of the city's development standards.

b. If a conflict between the two articles appears to exist, the standards contained in this article shall take precedence.

3. Materials. Signs shall be constructed of durable, low-maintenance materials that complement the design and character of the building they serve.

4. Preferred Signage Types.

a. The use of hanging signs is encouraged for non-gaming uses to reinforce the pedestrian-oriented scale of downtown. Hanging signs and other sign types attached to the front of buildings are permitted to project into the public right-of-way, over the sidewalk, subject to the issuance of an encroachment permit. Hanging signs shall not:

(1) Exceed 24 inches in height and 3 feet in length; or

(2) Be located where less than 8 feet of clear height can be provided above the sidewalk from the overhang or awning from which they are suspended.

b. The creative use of symbols or other images indicative of the use contained within the building in the design of signs is strongly encouraged.

c. The use of permanent window signs is encouraged for non-gaming uses to reinforce the pedestrian-oriented scale of downtown. Window signs shall not exceed 10 percent of the window area.

5. *Neighborhood Transition Character Area. The following standards shall be applicable within the neighborhood transition character area only.*

a. The maximum freestanding sign height shall be 6 feet.

b. Signs shall be designed to reflect the more residential scale and appearance of the neighborhood transition character area.

6. Wayfinding Signage. All on-site wayfinding signage shall be consistent with the city's wayfinding signage design standards.

7. A-Frame Signs ("Sandwich-Board" Signs).
- *a. One A-Frame sign is permitted per business per street frontage.*
- *b. Sign must be placed against the building the business operates from or within the landscaped area between the sidewalk and the street.*
- *c. A minimum of 6 feet of unobstructed sidewalk clearance must be maintained.*
- *d. Signs must be professionally manufactured and shall not exceed 32 inches in width and 36 inches in height. However, chalkboard frames with erasable letters are also appropriate.*
- *e. All signs shall be in good repair and neatly painted. No attachments to signs are permitted.*
- *f. Signs shall not be displayed during non-business hours.*
- *g. No sign shall be located where it obstructs the line of sight for passing motorists.*

STAFF RESPONSE: No signs have been proposed. Any proposed signs will be required to meet the downtown development standards.

6.6.4 Sustainable Design and Construction.

1. Intent.
- *a. To encourage the use of sustainable building materials and construction techniques in downtown projects, through programs such as the US Green Building Council's LEED (Leadership in Energy Efficiency and Design) program;*
- *b. To encourage the use of new and emerging technologies that lead to increased energy conservation for downtown uses; and*
- *c. To establish downtown Carson City as a leader in the incorporation of innovative and sustainable design and construction techniques.*

2. LEED (Leadership in Energy and Environmental Design). All new residential, commercial, and mixed-use buildings are required to meet basic LEED green building rating system criteria and are required to submit a LEED scorecard as part of the design review process.

STAFF RESPONSE: Modern construction techniques and materials will be utilized

6.6.4 Outdoor Gathering Spaces and Community Amenities.

1. Intent.
- *a. To establish a series of safe and inviting outdoor gathering spaces where downtown residents, employees, and visitors may gather, interact, rest, shop, and eat.*
- *b. To create an attractive public realm and vibrant pedestrian environment within downtown's most urban character areas.*
- *c. To encourage the incorporation of public art, urban recreation spaces, and other community amenities into the design of outdoor gathering space.*

2. Improvements in Public Space. Public and private improvements on any city-owned property within the DT-MU district, including without limitation streets, sidewalks, curbs, landscaping and outdoor gathering and urban recreation spaces must conform to the design standards in this chapter and to the city's downtown streetscape plan, as applicable.

3. Provision of On-Site Amenities.
- *a. Development on sites 50,000 square feet or less shall incorporate at least one of the following on-site outdoor gathering spaces or community amenities, and developments on sites larger than 50,000 square feet shall incorporate at least two of the following outdoor gathering spaces or community amenities and one additional amenity for each 25,000 square feet above 50,000 square feet of area, as highly-visible, easily-accessible, focal points:*
  - *(1) Patio or plaza with a minimum depth and width of 10-feet, and a minimum total*

area of 150 square feet.

(2) Landscaped mini-parks or squares provided such park or green has a minimum depth and width of 10-feet and a minimum total area of 250 square feet.

(3) Protected pedestrian walkways; arcades; recessed corner entries with a minimum area of 100 square feet; or easily identifiable building pass-throughs containing window displays and intended for general public access.

(4) Outdoor public art, as approved by the city, in an area that is:

(i) Visible from an adjacent public sidewalk or street, and

(ii) Easily accessed for viewing by pedestrians (e.g., a sculpture mounted to an exterior building wall).

(5) Similar feature as approved by the director or designee.

b. Outdoor gathering spaces provided in accordance with the above standard shall incorporate a variety of pedestrian amenities to promote regular use. Pedestrian amenities may include, but are not limited to, seating, lighting, special paving, landscaping, food and flower vendors, artwork, and/or special urban recreational features.

4. Buildings Adjacent to Outdoor Gathering Spaces/Community Amenities. To ensure the visibility and security of outdoor gathering spaces and community amenities, buildings located adjacent to an existing or planned pedestrian plaza, patio, or urban park shall provide at least two of the following elements along the building wall abutting the outdoor gathering space or community amenities:

a. A building entry;

b. Windows meeting the street frontage standards facing onto the outdoor amenity;

c. Arcades along the edges of the outdoor amenity;

d. Outdoor seating areas or cafes; or

e. A similar feature that the director finds will, to at least the equivalent degree; bolster security and encourage pedestrian use of the outdoor amenity.

5. Outdoor Decks and Balconies. Decks and balconies may project into the public right-of-way, over sidewalk areas, subject to the issuance of an encroachment permit.

STAFF RESPONSE: The applicant proposes a small public park visible and accessible from N. Stewart Street; there will be pedestrian paths around and through the site, and bike paths. Additionally, the applicant proposes community amenities such as a fitness center, pool, club house, and yoga studio. The applicant is meeting the requirements of this Division.

6.6.5 Parking.

1. Intent.

a. To encourage the redevelopment of smaller sites and the preservation and adaptive reuse of historic structures in downtown by providing a more flexible approach to parking;

b. To minimize the visual and physical impact of surface parking lots on the downtown pedestrian environment;

c. To reduce the predominance of single-purpose, surface parking lots in downtown; and

d. To make efficient use of available on-street parking.

2. Minimum Required On-Site Parking.

Type of Use	*Minimum # of on-site Parking Spaces Required*
Residential Uses	
1 bedroom or studio unit	*1 space/residential unit*
2 bedroom unit	*1.25 spaces/residential unit*
3 or more bedroom unit	*1.5 spaces/residential unit*

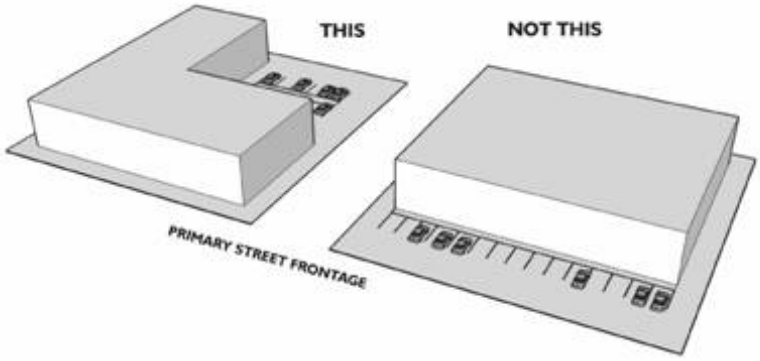
Senior citizen housing	*0.5 per bedroom plus 1 per employee for the largest shift.*
Guest Parking	*1 space per 8 dwelling units.*

3. Fee-In-Lieu. Applicants may make an in-lieu payment (as defined within the Carson City downtown parking strategy) for construction, maintenance and operation of public off-street parking or on-street parking instead of providing the full number of off-street parking spaces as required above. The portion of required parking eligible for an in-lieu payment shall vary according to the type of use and the size of the development as follows:

Type of Use	Percentage of Required Off-street Parking spaces eligible for in-lieu payment
Residential Uses	
Guest Parking Only	Up to 25-percent

4. Shared Parking. The amount of off-street parking required may be reduced by an amount determined through a parking demand study establishing that sufficient parking is or can be met by the subject uses through shared parking. The parking demand study shall provide information and evidence about the anticipated parking demand at peak times during the day and the distance relationship between available shared parking spaces and the specific uses served.

5. Tandem Parking. Required parking for residents of residential developments may be provided in the form of tandem parking when at least one space is within an enclosed garage or parking structure.



6. Parking Location. Surface parking shall be located behind and/or to the side of buildings. Surface parking will not be permitted between the building and the primary street frontage.

STAFF RESPONSE: Using the parking requirements of the Development Standards, 253 parking spaces are required. The applicant is providing 253 on-site parking spaces. A fee-in-lieu, shared parking, and tandem parking are not proposed. The proposed parking is interior to the site and will be shielded from the street by the residential buildings.

6.6.6 Landscaping and Screening.

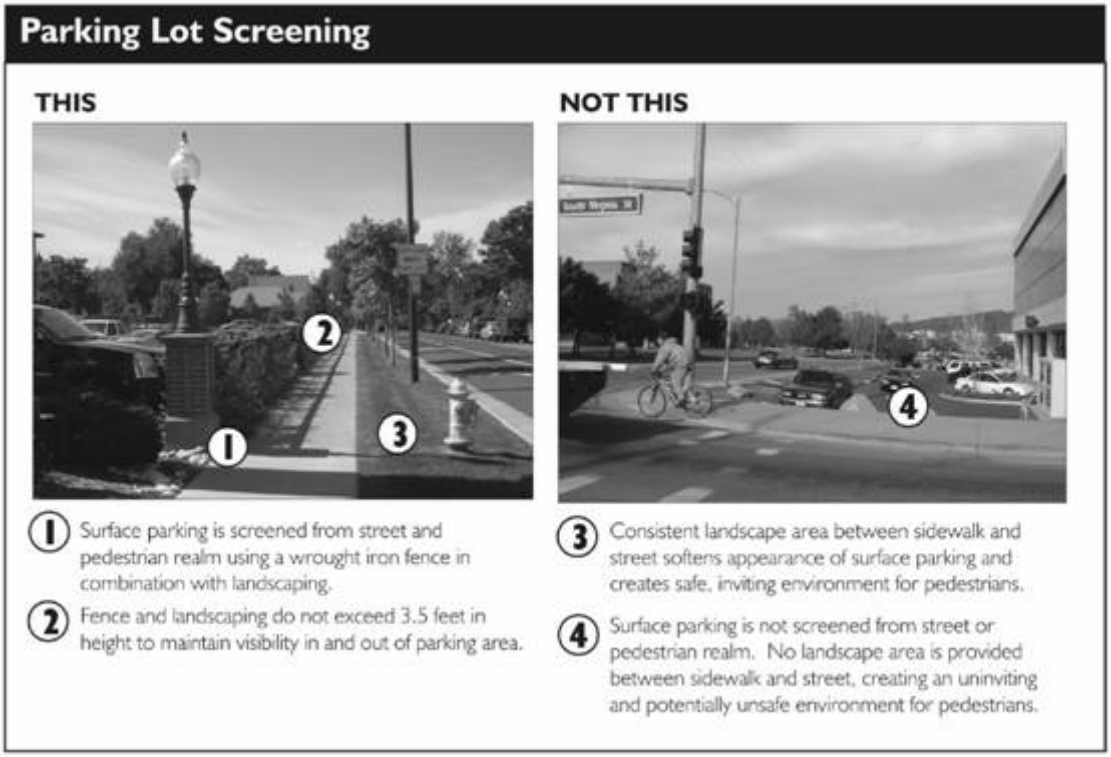
1. Intent.
- *a. To create a more attractive, inviting, streetscape environment within downtown;*
- *b. To reduce the visual prominence of surface parking within downtown; and*
- *c. To reinforce the more urban character of the downtown streetscape through the use of less space-intensive, structural screening methods.*

2. Parking Lot Screening.

a. All surface parking lots visible from the public right-of-way shall be screened using one of the following methods, unless otherwise noted in (c), below:
   (1) A low masonry wall in combination with landscaping; or
   (2) A wrought iron or other ornamental fence in combination with landscaping.

b. To satisfy the above standard:
   (1) Landscaping shall be planted between the wall and the public right-of-way, sidewalk, or boundary; and
   (2) Walls, fences, and landscaping shall not exceed 3.5 feet in height to adequately screen most car headlights while maintaining clear visibility into and out of the parking lot.

c. Developments of less than 10,000 square feet, or that involve the renovation of an existing building may use an ornamental fence or wall as a standalone screening mechanism to meet the surface parking screening requirement above to maximize available space.



STAFF RESPONSE: Parking will be interior to the site and will be shielded by the residential building, thus will not have a parking lot/sidewalk interface. Landscaping will be included along the perimeter of the project site.

3. Trash Collection Areas.

a. Trash enclosure area shall be provided or available to serve any new development or building expansion. Unscreened storage of trash receptacles is prohibited.

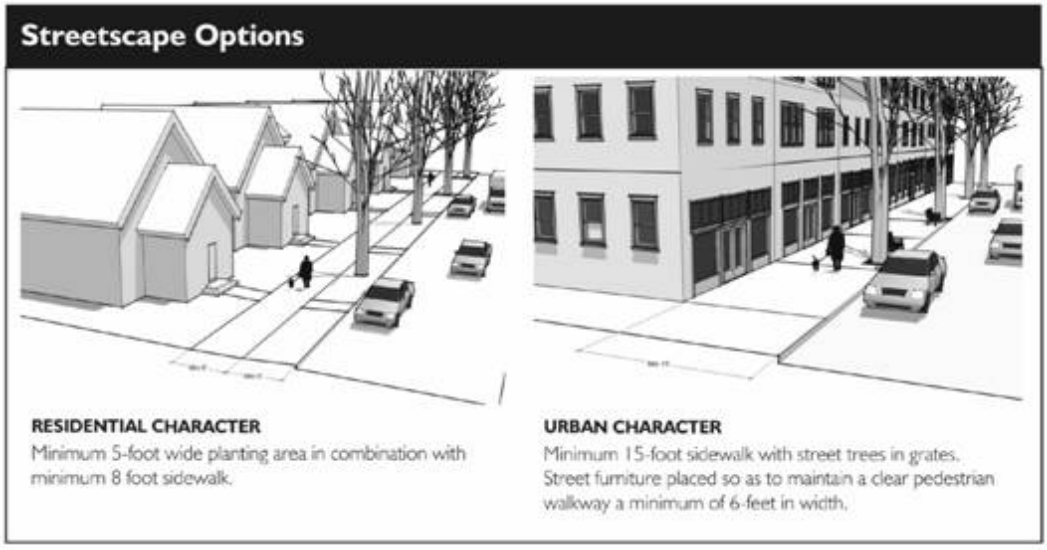
b. Trash collection areas shall be screened from public rights-of-way and adjacent uses through the use of a 6-foot masonry wall enclosure and gate.

c. Trash enclosures should be compatible with the architectural character of the building they serve and should incorporate similar materials and colors.

STAFF RESPONSE: The trash enclosures are located throughout the property. Staff has included a condition of approval requiring the trash enclosures to meet the requirements of Division 1 of the Carson City Development Standards, utilizing similar materials to the building facades.

6.6.7 Streetscape.

1. *Intent.*
   a. *To create a safe, inviting streetscape environment for pedestrians in downtown;*
   b. *To ensure that streetscape enhancements provided by infill and redevelopment projects are consistent with the city's downtown streetscape plan, and the surrounding development context, as applicable.*
2. *Downtown Streetscape Plan. Streetscape treatments (including street furniture) for all developments shall be provided in accordance with the city's downtown streetscape plan, as applicable.*
3. *Streetscape.*
   a. *Prior to the completion of the city's downtown streetscape plan, and for all other properties not addressed within the completed downtown streetscape plan, streetscape shall be provided along all street frontages as follows:*
      (1). Residential Character: Minimum 5 foot-wide planter area in combination with minimum 8 foot sidewalk; or
      (2) Urban Character: Minimum 15-foot sidewalk with street trees in grates.
   b. *Where angled, on-street parking currently exists or is specified within the city's downtown streetscape plan and the above configurations are not feasible, alternative streetscape configurations may be approved by the director.*
   c. *Street furniture shall be placed so as to maintain a clear pedestrian walkway that is a minimum of 6 feet in width. Street furniture includes benches, trash receptacles, outdoor* dining areas, and other pedestrian amenities.



4. *Clear Zone. A clear zone of a minimum of 6-feet in width that is unobstructed by any permanent or nonpermanent street furniture, outdoor merchandise displays, benches, trash receptacles, outdoor dining areas, and other pedestrian amenities must be maintained.*

5. *Outdoor Merchandise Displays.*
   a. *Each business shall be limited to one outdoor merchandise display. Outdoor merchandise displays may include:*
      (1) A single display table a maximum of 3 feet wide and 6 feet in length;
      (2) A mannequin used to display clothing or other merchandise sold within the store;
      (3) A grouping of furniture or other merchandise sold within the store that occupies a portion of the sidewalk not more than 3 feet in width and 6 feet in length; or

(4) Similar display as approved by the director.

b. Outdoor merchandise displays must be placed against the building the business operates from or within the landscaped area between the sidewalk and the street.

c. Outdoor merchandise displays shall be in compliance with clear zone provisions, as specified in subsection 6.6.7(4), of this section.

d. Outdoor merchandise displays shall not be displayed during non-business hours.

e. No outdoor merchandise display shall be located where it obstructs the line of sight for passing motorists.

STAFF RESPONSE: The sidewalk and street level interest/transparency requirements are part of creating an inviting, pedestrian friendly environment. The applicant is proposing an 8 foot sidewalk along N. Plaza and N. Stewart with a landscape strip between the sidewalk and the street. Along E. Washington, the applicant will be providing a 10 foot sidewalk with a landscape strip between the street and the sidewalk. Along E. William Street a 10 foot sidewalk will be provided with a 9 foot landscape strip between the sidewalk and the building. The proposed sidewalk width is consistent with the requirements for a project with the residential character within the DT-MU zoning district. Staff finds, with the elimination of the requirement for a mix of uses, as outlined above, the reduced sidewalk width is appropriate.

6.6.9 Street and Sidewalk Vending.

1. Intent.

a. To establish a set of baseline standards for the regulation of street vendor carts within downtown to ensure that they complement existing retail businesses, are compatible with the character of downtown, and expand the range of services available to downtown workers, visitors, and residents; and

b. To establish a framework for the long-term development of a formal street and sidewalk vending program to enliven the Downtown streetscape.

2. Vendor Carts. Street vendors are permitted in the DT-MU district only after approval by the redevelopment advisory citizens committee. Street vendors should have a positive impact upon the downtown, as determined by an evaluation of the application against all relevant provisions of this title. The following minimum standards shall apply for all such requests:

a. Street vendors shall be approved at a specific, permanent location;

b. Carts used for street vending shall be on wheels and shall not be larger than 3 feet by 5 feet;

c. Only consumable products may be sold from a street vendor cart;

d. If located within a city or State right-of-way, encroachment permits and liability insurance shall be required;

e. If adjacent to or in front of a business not their own, the street vendor cart operator shall be responsible for obtaining permission of the affected business and property owner and shall submit evidence of such permission;

f. If adjacent to or in front of a property listed in the Carson City historic district, review, approval, and compliance with conditions of the HRC shall be required;

g. Electrical and gas services require review and approval of the building and engineering divisions and the fire department;

h. Approval of the health department is required for all food vendors.

3. Vending Review Board. The redevelopment advisory citizens committee shall serve as the vending review board to review all applications for street vending.

STAFF RESPONSE: No street vendors or vendor carts are proposed.

6.6.10 Building Design and Character.

1. Intent.

a. Allow for the incorporation of a variety of architectural styles while ensuring that infill and redevelopment relates to the historic traditions of downtown Carson City and its surrounding neighborhoods in terms of its basic form, composition of building elements, and quality of materials;

b. Establish a high quality appearance for downtown infill and redevelopment through the incorporation of architectural detailing, façade articulation, and other features designed to provide a more distinct character and pedestrian scale;

c. Ensure that infill and redevelopment contributes towards the vision set forth for downtown by the city's master plan.

2. Materials. Primary building materials shall be durable and project an image of permanence typical of downtown's traditional masonry storefronts and public buildings. Appropriate materials include, but are not limited to brick, stone, or other masonry products, steel, stucco, cast concrete, split face block, composite siding, or comparable material approved by the director.

3. Four-Sided Design.

a. All building facades shall be designed with a similar level of design detail. Blank walls void of architectural detailing shall not be permitted.

b. Exceptions from the above standard may be granted for those areas of the building envelope that the applicant can demonstrate are not visible from adjacent development and streets.

c. Entrance locations should be placed with consideration of business-to-business pedestrian access and the relation to pedestrian crossings for safety.

4. Street Level Interest/Transparency.

a. A minimum percentage of the total area of each ground floor building façade which faces a street, plaza, park, or other public space, shall be comprised of transparent window openings to allow views of interior spaces and merchandise, to enhance the safety of public spaces by providing direct visibility to the street, and to create a more inviting environment for pedestrians. Minimum percentages vary according to character area and use as follows:

(1) Main Street Mixed-Use Character Area: 50 percent minimum.

(2) Urban Mixed-Use Character Area:

(a) Non-Residential Uses: 50 percent minimum;

(b) Residential Uses: 35 percent minimum.

(3) Neighborhood Transition Character Area:

(a) Non-Residential Uses: 40 percent minimum;

(b) Residential Uses: 30 percent minimum.

b. For the purposes of the above standard, all percentages shall be measured using elevation views of the building plan and "ground floor" shall be measured from floor plate to floor plate.

c. The following standards shall apply to all ground floor windows:

(1) Non-residential Uses. Glazing on all ground floor windows shall be transparent;

(2) Residential Uses. Glazing on ground floor windows shall be transparent to allow views into common hallways, foyers, or entryways, but may be translucent or opaque when necessary to protect the privacy of ground-floor spaces used for dwelling purposes;

(3) Black or mirrored glass is prohibited.

5. Primary Building Entrances. Primary building entrances shall be clearly distinguished through the use of one or more of the following architectural features:

a. Covered walkways or arcades;

b. Awnings, canopies, or porches; and/or

c. Projected or recessed building mass.

6. Parking Structures.
a. Facades of single-use parking structures (e.g., no retail or residential) shall be articulated through the use of 3 or more of the following architectural features;
(1) Windows or window shaped openings;
(2) Masonry columns;
(3) Decorative wall insets or projections;
(4) Awnings;
(5) Changes in color or texture of materials;
(6) Approved public art;
(7) Integrated landscape planters; or
(8) Other features as approved by the director or designee.
b. Openings in parking structures shall be designed to screen views of parked cars from surrounding properties through the use of architectural screens or similar features.
7. Residential Garage Location and Design.
a. Where lot configurations permit, residential garages shall be located in the rear yard and accessed from the alley or a narrow drive from the street, as traditionally found in downtown's residential neighborhoods.
b. Attached front-loading garages shall be recessed behind the front façade of the home a minimum of 10 feet.
8. Screening of Utility/Mechanical Equipment.
a. Roof mounted mechanical equipment shall be screened from public rights-of-way and adjacent properties through the use of parapet walls, equipment wells, architectural screens, or similar features that may be integrated into the overall design of the building.
b. All equipment shall be located below the highest vertical element of the building.
c. Wall-mounted air conditioning units shall be integrated into the design of the building and/or screened.

STAFF RESPONSE: The applicant proposes a 3-story building with loft space above some of the units for a total height of 42 feet. Materials proposed include stucco and stone and brick veneer. The plans include four-sided architecture. The applicant has requested the use of the residential character requirement for transparency. Staff has recommended a condition of approval that at the time of building permit application, the applicant will demonstrate that 35 percent of the building frontage along the sidewalk includes window openings consistent with Division 6.6.10.4.c.2.

6.6.11 Guidelines for the Renovation and Restoration of Existing Structures.
1. Intent.
a. To promote the preservation of existing downtown buildings that have historic characteristics, although they are not included as part of the historic district.
b. To promote and establish appropriate procedures for the cleaning, renovation, and restoration of original downtown storefronts that have been substantially altered and obscured during previous remodeling efforts.
2. Inappropriate Alterations.
a. Remodeling with unauthentic false historical details, trims, and moldings creates a confusing historical context for the community and should be avoided.
b. The use of light gauge metal, steel panels, or other materials to make two or more storefronts appear to be a single, larger structure should be avoided. If panels are already in place, upper story windows, storefronts, doors, cornices, and other trim materials which were removed to accommodate the panels should be researched and replaced during the rehabilitation process.
c. Upper story doors and windows and street-level storefronts that have been previously covered, sealed, or filled in should be restored to their original proportions and

appearance during the rehabilitation process.

d. Transom windows which were covered over when suspended acoustical tiled ceilings were installed, or for other reasons, should be uncovered during the rehabilitation process.

3. Cleaning.

a. Abrasive cleaning techniques such as sandblasting should be avoided on the exterior of downtown buildings. Such cleaning methods cut into the building's materials, causing irreversible damage.

b. Sandblasted buildings that have not severely deteriorated should be painted to slow the process. Care must be taken to avoid varnishes, enamels, polyurethane sealants and other products impervious to moisture penetration. Sealants will lock moisture inside the masonry and prevent evaporation ultimately causing severe moisture damage.

c. As an alternative to abrasive cleaning techniques, the following techniques should be considered:

(1) A gentle water wash in combination with a natural bristle brush used to gently scrub the surface of the building. If necessary, a mild detergent can be used, but must be thoroughly rinsed.

(a) For heavy grime or layers of paint, a chemical cleaner may be necessary. Alkaline or acidic cleaners are available; however, chemical cleaning should always be done by experienced professionals.

(b) A steam cleaning process may also be appropriate for certain building materials.

d. Whether water, steam, or chemical cleaner is used, always clean a test patch area first to judge the reaction, or consult a professional in the field. A list of local professionals is available at the planning division.

e. All debris and cleaning materials should be contained on site and not allowed to flow into the storm drain system.

4. Repair, Removal, and Replacement.

a. Removal of materials or structures including oversized signs, windows or door coverings, or metal slipcovers should not take place until the following steps are followed:

(1) Inventory and photograph or draw accurate elevations of the elements to be removed;

(2) Examine each element and determine how it is attached and anchored to the building. If possible, remove a small portion of a slipcover to determine how the rest is anchored;

(3) Create a plan for repair of original material that was damaged when alterations were made; drilled holes for anchor bolts, lost or damaged decorative elements, accumulated dirt and rust stains are the most common types of damage.

b. If a decorative element such as a cornice or trim around a window was removed or altered to accommodate earlier renovation efforts, it may require replication by a skilled artisan or replacement with a simpler element. Catalogs of companies that specialize in replicating historic building architectural details are available from the planning division.

c. If the original element is lost and no photo documentation is present, it is recommended that the element be substituted with a more conservative design element.

d. Materials used to renovate existing buildings should be of a texture, scale, and color that are compatible with the original primary building material. Replacement parts should be selected so as to blend in with existing ones; rather than calling attention

to themselves.

e. Native stone and masonry should be retained on existing buildings when possible.

f. Missing or damaged architectural features that are to be replaced should blend with the building fabric and duplicate the old or match it as closely as possible. However, these new materials should not be antiqued or made to look old when they are not.

g. Retention of original historic building elements is encouraged over replacement. When replacement is required, attention should be given to matching the building's original window treatment as closely as possible.

STAFF RESPONSE: The proposed development does not include the restoration or renovation of an existing structure.

6. *Will not be detrimental to the public health, safety, convenience and welfare.*

The project will not be detrimental to the public health, safety, convenience, or welfare. The applicant is permitted to have a multifamily residential use. The Special Use Permit is for the alternative compliance relative to a single use, an alternative sidewalk design, use of the residential character requirement for transparency, and a reduced building "step back." Given the location of this property at the near the northern edge of the DT-MU, staff finds that none of the requested alternative compliance requests will be detrimental to public health, safety, convenience and welfare.

7. *Will not result in material damage or prejudice to other property in the vicinity, as a result of proposed mitigation measures.*

The project will not result in material damage or prejudice to other property in the vicinity. The applicant is permitted to have a multifamily residential use. The Special Use Permit is for the alternative compliance relative to a single use, an alternative sidewalk design, use of the residential character requirement for transparency, and not having a building "step back." Given the location of this property at the northern edge of the DT-MU, staff finds that none of the requested alternative compliance requests will result in material damage or prejudice to other property in the vicinity.

Supplemental findings

Development Standards 6.5.2 requires that in addition to the findings listed in Section 18.02.080 of this code, the following three supplement findings must be found in the affirmative for the proposed conditional use.

1. Is consistent and compatible with the character and intent for the downtown character area in which it is proposed;

Given the location adjacent to commercial uses and near jobs, staff finds that limiting the building to a single use is consistent and compatible with the character and intent for the downtown.
The sidewalk and street level interest/transparency requirements are part of creating an inviting, pedestrian friendly environment. The applicant is proposing an 8 foot sidewalk along N. Plaza and N. Stewart with a landscape strip between the sidewalk and the street. Along E. Washington, the applicant will be providing a 10 foot sidewalk with a landscape strip between the street and the sidewalk. Along E. William Street a 10 foot sidewalk will be provided with a 9 foot landscape strip between the sidewalk and the building. The proposed sidewalk width is consistent with the requirements for a project with the residential character within the DT-MU zoning district. Staff finds, with the elimination of the requirement for a mix of uses, as outlined above, the reduced sidewalk width will be compatible with the character and intent of the Urban Mixed Use area.

The applicant has also requested the use of the requirements for residential character street level interest/transparency. The applicant is proposing a strictly residential use. Staff finds that compliance with the residential character requirement for transparency is appropriate.

The applicant is proposing a 3-story building with some units having a loft area, with a minimum of step back of 10 feet. The step back is part of creating an inviting, pedestrian friendly environment in that it allows for sunshine to reach sidewalks and outdoor areas and avoids a constant shadow. In this case, the site is designed with a 19-foot setback as well as a minimum of a 10-foot step back above 36 feet, providing for a more open pedestrian friendly environment. Given this design, the sidewalk will receive sunshine. Therefore, staff finds that the reduced step back will be consistent and compatible with the Urban Mixed-Use character.

2. Incorporates or can be incorporated as part of a broader mix of uses to support an active "people-oriented" environment within the downtown character area; and

By having an entirely residential use adjacent to commercial uses and near jobs, it will allow residents to access the commercial services in the area as well as jobs without having to drive. The alternative sidewalk width will still include planters and 8-10-foot-wide sidewalks to make the pedestrian experience welcoming. Additionally, the applicant is proposing amenities such as a small public park, visible and accessible from N. Stewart Street; bike paths; and public pathways along the sidewalks and internal to the project site. These amenities will help to provide for a more active, “people-oriented” environment. Given the setback of at least 19 feet around the entire site, in combination with a minimum step back of 10 feet, staff does not find that the reduced “step back” will compromise the pedestrian experience as there will still be sun and light on the sidewalk.

3. Can be integrated into the more urban development pattern in a manner that is consistent with master plan policies for downtown.

Staff finds that the proposed development is consistent with the master plan policies for downtown. It will add to the revitalization of downtown and surrounding areas while complying with most of the development standards. It will include pedestrian improvements and a pedestrian friendly building that will add to the “people-oriented environment.

Attachments:
Application LU-2021-0452

Carson City Planning Division
108 E. Proctor Street · Carson City NV 89701
Phone: (775) 887-2180 • E-mail: planning@carson.org

FOR OFFICE USE ONLY:

CCMC 18.02.080

SPECIAL USE PERMIT

FEE*: **$2,450.00 MAJOR**
$2,200.00 MINOR (Residential zoning districts)
+ noticing fee
***Due after application is deemed complete by staff**

FILE

APPLICANT **PHONE #**
Kingsbarn Capital & Development (702) 553-9488

MAILING ADDRESS, CITY, STATE, ZIP
1645 Village Center Cir, Suite 200, Las Vegas, NV 89134

EMAIL ADDRESS
ahama@kingsbarn.com

PROPERTY OWNER **PHONE #**
Virginia and Truckee Round House Property Inc., etal. (775) 267-4115

MAILING ADDRESS, CITY, STATE, ZIP
P.O. Box 964, Carson City, NV 89702

EMAIL ADDRESS
Louislarquier@gmail.com

APPLICANT AGENT/REPRESENTATIVE **PHONE #**
Anthony Hama (702) 553-9488

MAILING ADRESS, CITY STATE, ZIP
1645 Village Center Cir, Suite 200, Las Vegas, NV 89134

EMAIL ADDRESS
ahama@kingsbarn.com

SUBMITTAL PACKET – 4 Complete Packets (1 Unbound Original and 3 Copies) including:
- Application Form
- Detailed Written Project Description
- Site Plan
- Building Elevation Drawings and Floor Plans
- Special Use Permit Findings
- Master Plan Policy Checklist
- Applicant's Acknowledgment Statement
- Documentation of Taxes Paid-to-Date
- Project Impact Reports (Engineering)

CD or USB DRIVE with complete application in PDF

Application Received and Reviewed By:

Submittal Deadline: Planning Commission application submittal schedule.

Note: Submittals must be of sufficient clarity and detail for all departments to adequately review the request. Additional information may be required.

Project's Assessor Parcel Number(s):	Street Address	
002-161-06 & 002-161-07	201 E. William St, Carson City, NV 89701	
Project's Master Plan Designation	**Project's Current Zoning**	**Nearest Major Cross Street(s)**
400 - General Commercial	DTMU	William & Stewart

Please provide a brief description of your proposed project and/or proposed use below. Provide additional pages to describe your request in more detail.
207 unit apartment rental project. The current design call for 5 total buildings each being 3 stories in height. The total site area is 4.93 acres and will provide 253 on-site parking stalls for residents and guests. First class amenities will be

PROPERTY OWNER'S AFFIDAVIT

I, Louis Larquier, being duly deposed, do hereby affirm that I am the record owner of the subject property, and that I have knowledge of, and I agree to, the filing of this application.

Louis Larquier — Signature
PO Box 964 Carson City NV 89702 — Address
11-19-2021 — Date

Use additional page(s) if necessary for additional owners.

STATE OF NEVADA)
COUNTY)

On November 19, 2021, Louis A Larquier, personally appeared before me, a notary public, personally known (or proved) to me to be the person whose name is subscribed to the foregoing document and who acknowledged to me that he/she executed the foregoing document.

Sonja Fischer — Notary Public

SONJA FISCHER
NOTARY PUBLIC
STATE OF NEVADA
APPT. No. 04-89854-12
MY APPT. EXPIRES MARCH 14, 2022

NOTE: If your project is located within the Historic District or airport area, it may need to be scheduled before the Historic Resources Commission or the Airport Authority in addition to being scheduled for review by the Planning Commission. Planning staff can help you make this determination.

If there is any additional information that would provide a clearer picture of your proposal that you would like to add for presentation to the Planning Commission, please be sure to include it in your detailed description.

Please type and sign the statement on the following page at the end of your findings response.

ACKNOWLEDGMENT OF APPLICANT

I certify that the forgoing statements are true and correct to the best of my knowledge and belief. I agree to fully comply with all conditions as established by the Planning Commission. I am aware that this permit becomes null and void if the use is not initiated within one-year of the date of the Planning Commission's approval; and I understand that this permit may be revoked for violation of any of the conditions of approval. I further understand that approval of this application does not exempt me from all City code requirements.

Applicant's Signature	Print Name	Date
	Anthony Hanna	12/15/2021

Special Use Permit

William Street Apartments

Detailed Project Description

William Street apartments is a proposed 207-unit luxury apartment rental project located at the southwest corner of E William St and N Stewart St, behind the existing Jack in the Box. The project site is 4.93 acres and consists of a large vacant lot with 4 existing commercial buildings along William St and Washington St. The commercial buildings will be demolished prior to commencement of grading operations. The vacant lot is of generally level topography with no other vertical improvements. The conceptual site plan shows five (5) buildings, each are three (3) stories in height plus a loft level. The community will feature a desirable mix of common area amenities which include a clubhouse, pool, barbecues, outdoor seating, fire pits and walking paths.

Kingsbarn Capital & Development is the developer of this project and is seeking the following waivers of development standards within the Downtown Mixed Use (DT-MU) District:

1. Waiver of Required Mix of Uses:

   For projects greater than 50,000 square feet, the code requires at least one commercial/service/retail component to be included within the development. Kingsbarn is requesting a waiver of this requirement and proposes a purely residential project. We believe this is appropriate since there is already substantial commercial and retail space in the immediate area. It can also be observed that the existing commercial buildings have a fair amount of vacancy which suggests that the commercial/retail sector may be overbuilt. With Carson City apartment vacancy rates in the low single digits, it suggests that more apartment units are needed to meet the increasing market demand. For these reasons we believe that eliminating the commercial space requirement in lieu of more apartment units is supported.

2. Compliance with Residential Character:

   If planning staff supports our waiver of commercial/retail space as requested above, Kingsbarn believes that compliance with the Residential Streetscape Character rather than the Urban Streetscape Character is warranted. This would allow for a reduction in sidewalk widths and transparency, among other things. Specifically we are seeking approval for design of the project as shown in the submitted site plan and elevations. We have had preliminary discussions with planning and there has been some indication that a reduction in sidewalk widths to 8' along Plaza & Stewart Streets and 10' along Williams & Washington Streets is acceptable. Landscaping will comply with code requirements.

3. Waiver of building Stepback Distance:

   The design of our buildings includes lofts at the third level. This increases the height of the buildings to 42 feet at certain portions of each building, specifically at the loft level rooftops. The code allows for buildings in the DTMU to be 36 feet in height with a required "stepback" if the height exceeds 36 feet. Depending on which street you are adjacent to, the stepback varies from 10 to 25 feet. Our design generally provides a stepback of at least 10 feet at each loft and up to 23.5 feet some instances. We comply with the required minimum stepback on Plaza Street but do not meet the stepback at Williams, Stewart or Washington Streets. Applicant kindly requests a waiver of the stepback from 25 feet to 10 feet along these streets. The table below ssummarizes the stepback at each building location:

TABLE A
Loft Stepback Analysis

Fronting Street	Location	Required Stepback	Minimum Stepback Provided	Average Stepback Provided
William St	Building A	25 Feet	10 Feet	14.68 Feet
Washington St	Building C	25 Feet	10 Feet	17.13 Feet
	Building D	25 Feet	10 Feet	19.31 Feet
S Plaza St	Building A	10 Feet	10 Feet	18.82 Feet
	Building B	10 Feet	6 Feet	10.25 Feet
	Building C	10 Feet	10 Feet	20.26 Feet
Stewart St	Building D	25 Feet	10 Feet	20.26 Feet
	Building E	25 Feet	10 Feet	23.5 Feet

We believe this waiver request is reasonable for the following reasons. The increase in height is only 6 feet while the average building stepback is more than 15 feet which represents a very flat 2/5 slope. Therefore, the increased building height at the lofts will not be visible from the street level. Also, the roofline at the loft level is not linear across the top of the buildings. in other words, the lofts act as "pop ups" which rise to 42 feet, then drop back down to the 36 foot primary roof level. These pop up loft rooflines help to break up the elevation of the building roofline and provide a more pleasing visual aesthetic when the buildings are viewed from a distance. It should also be noted that on several sides of the project we are providing additional landscape buffering which further sets back the buildings (and rooflines) from the public right of way.

Project Design Features

The William St apartments will set a new standard for luxury apartment living in Carson City. The project will feature the following design elements and amenities:

- The design of the project will generally follow the standards and requirements of the Downtown Mixed Use (DT-MU) District.
- Exterior architecture will retain the "Main Street" character and appeal of Carson Street while introducing modern touches that will blend with the surrounding neighborhood.
- Unit mix will consist of studio, one, and two-bedroom units. Unit sizes will reflect market demand and efficient floorplan layout.

- The project will be Class A and units will feature kitchen islands, large patio sliders, 8' entry doors, walk-in closets, coat closets, bathroom shelving and larger secondary bedrooms. Window sizes and locations will be designed in a manner to maximize natural light in each unit.
- Certain floorplans will feature a third floor loft with open views to the living areas below
- The latest in smart home technology will be on display at William Street. Residents will enjoy high speed internet with property wide Wi-Fi. Touchless access, Nest thermostats and video doorbells will also be featured.
- Parking meets the code requirement and is provided through a mix of surface parking stalls and tuck under garages. Surface parking stalls will include covered carports with LED lighting. Electric vehicle charging stations will be included throughout the site.
- The clubhouse will provide an expansive area for residents to work, gather and socialize. The clubhouse will have a "resort" feel and with an enhanced indoor/outdoor experience with large windows and pocket slider doors. This will be the centerpiece of the community.
- A large fitness center will also be provided showcasing a variety of cardiovascular and weightlifting equipment plus a dedicated stretching area/yoga studio. The design of the fitness center will capture a lot of natural light and open up to the pool area.
- The pool area will feature resort style amenities such as cabanas, chaise lounges, fire pits and BBQ areas. The club and fitness center will have access to the pool deck.
- Landscape and streetscape will reflect a true downtown feel. Tree planting, shrubs and flower species will be spread throughout the community creating a pleasing aesthetic

WILLIAM ST APARTMENTS – SUP APPLICATION FINDINGS

CCMC 18.02.080(5) FINDINGS. Findings from a preponderance of evidence must indicate that the proposed use:

1. Will be consistent with the objectives of the Master Plan elements.

The project is consistent with the Carson City master plan and also meets or exceeds the objectives and requirements of the Downtown Mixed-Use District. Responses to the five themes outlined in the Master Plan Policy Checklist are provide below:

CHAPTER 3: A BALANCED LAND USE PATTERN

The Carson City Master Plan seeks to establish a balance of land uses within the community by providing employment opportunities, a diverse choice of housing, recreational opportunities, and retail services.

✔ Meet the provisions of the Growth Management Ordinance (1.1d, Municipal Code 18.12)?

This project meets the provisions of the Growth Management Ordinance by locating housing in a priority infill area that is adjacent to existing roadways and services. The project will help to better maximize the use of Carson City's infrastructure. Infill residential is encouraged within the Master Plan. The project has convenient access to all community services and major roadways.

Use sustainable building materials and construction techniques to promote water and energy conservation (1.1e and f)?

The project will include modern insulation materials, window frames and exterior finishes that reduce energy use. Landscaping will be designed to minimize water use. Exact specifications of materials will be further defined as building plans are submitted to Carson City.

Located in a priority infill development area (1.2a)?

The project site is located in a priority infill area

Provide pathway connections and easements consistent with the adopted Unified Pathways Master Plan and maintain access to adjacent public lands (1.4a)?

The project is and will be accessible from all sides. No public lands are adjacent to the project

Protect existing site features including mature trees and other character-defining features (1.4c)?

There are no mature trees or other defining features on the property.

At adjacent county boundaries or adjacent to public lands, coordinated with the applicable agency with regards to compatibility, access, and amenities (1.5a,b)?

The site is not located along a county boundary.

☐ In identified Mixed-Use areas, promote mixed-use development patterns as appropriate for the surrounding context consistent with the land use descriptions of the applicable Mixed-Use designation, and meet the intent of the Mixed-Use Evaluation Criteria (2.1b, 2.2b, 2.3b, Land Use Districts, Appendix C)?

The site is located within the DTMU zoning district and will follow the guidelines. The project site is surrounded by commercial and retail uses and therefore will not include any commercial component.

✔ ☐ Meet adopted standards for transitions between non-residential and residential zoning districts (2.1d)?

The project is located within the DTMU and does not abut to any residential zoning districts

☐ Protect environmentally sensitive areas through proper setbacks, dedication, or other mechanisms (3.1b)?

There are no environmentally sensitive areas on the site.

✔ ☐ Sited outside the primary floodplain and away from geologic hazard areas or follow the required setbacks or other mitigation measures (3.3d, e)?

The site is not located in a floodzone and is set apart from any hazard areas. Setbacks will be incorporated into the project design as mandated by Carson City development standards

✔ ☐ Provide for levels of services (i.e. water, sewer, road improvements, sidewalks, etc) consistent with the Land Use designation and adequate for the proposed development (Land Use table descriptions)?

The site is already served by all utilities and city services. No material impact on existing services is to be expected.

☐ If located within an identified Specific Plan Area (SPA), meet the applicable policies of that SPA (Land Use Map, Chapter 8)?

The site is located within the DTMU and will follow its policies and guidelines

CHAPTER 4: EQUITABLE DISTRIBUTION OF RECREATIONAL OPPORTUNITIES

The Carson City Master Plan seeks to continue providing a diverse range of park and recreational opportunities to include facilities and programming for all ages and varying interests to serve both existing and future neighborhoods.

Is or does the proposed amendment:

✔ Provide park facilities commensurate with the demand created and consistent with the City's adopted standards (4.1b)?

The project will provide recreational amenities on site. This includes outdoor seating areas, walking paths, pool area and a clubhouse.

Consistent with the Open Space Master Plan and Carson River Master Plan (4.3a)?

The site is consistent with the Open Space Master Plan and has no impact on the River Master Plan.

CHAPTER 5: ECONOMIC VITALITY

The Carson City Master Plan seeks to maintain its strong diversified economic base by promoting principles which focus on retaining and enhancing the strong employment base, include a broader range of retail services in targeted areas, and include the roles of technology, tourism, recreational amenities, and other economic strengths vital to a successful community.

Is or does the proposed amendment:

✔ Encourage a citywide housing mix consistent with the labor force and non-labor force populations (5.1j)

This project directly promotes this policy by adding additional housing close to existing employment centers.

Encourage the development of regional retail centers (5.2a)

This project does not include any retail but it does support existing retail operations by locating potential customers close to businesses.

Encourage reuse or redevelopment of underused retail spaces (5.2b)?

By adding potential customers close to existing businesses, this project could be seen as encouraging local retail.

Support heritage tourism activities, particularly those associated with historic resources, cultural institutions and the State Capitol (5.4a)?

There is little ability for this application to either negatively or positively affect heritage tourism activities in a material way.

Promote revitalization of the Downtown core (5.6a)?

This project will directly promote revitalization of the Downtown core by adding 207 dwelling units to the downtown area. Businesses in downtown will benefit from the increased population created by this project.

✔ Incorporate additional housing in and around the Downtown, including lofts, condominiums, duplexes, live-work units (5.6c)?

As the proposed project is located in the Downtown Mixed Use District, it directly addresses this need.

CHAPTER 6: LIVABLE NEIGHBORHOODS AND ACTIVITY CENTERS

The Carson City Master Plan seeks to promote safe, attractive and diverse neighborhoods, compact mixed-use activity centers, and a vibrant, pedestrian-friendly Downtown.
Is or does the proposed amendment:

✔ Use durable, long-lasting building materials (6.1a)?

The project will be constructed with modern building methods and materials. We intend to hold this project for the long-term and will be built in a manner consistent with long term ownership.

✔ Promote variety and visual interest through the incorporation of varied building styles and colors, garage orientation and other features (6.1b)?

The included image board exhibit shows that the project will provide contemporary new buildings with articulation, private balconies, and natural colors.

✔ Promote variety and visual interest through the incorporation of well-articulated building facades, clearly identified entrances and pedestrian connections, landscaping and other features consistent with the Development Standards (6.1c)?

The included elevation exhibits show that the proposed buildings are articulated and provide visual appeal. Pedestrian pathways and entrances will be obvious and well-marked. Generous open space and site landscaping will allow for an attractive site.

✔ Provide appropriate height, density and setback transitions and connectivity to surrounding development to ensure compatibility with surrounding development for infill projects or adjacent to existing rural neighborhoods (6.2a, 9.3b 9.4a)?

The project will be complementary to surrounding development in terms of height, setbacks, and use and will therefore be directly compatible. The project conforms to the setback requirements for downtown development. Some waivers of development standards are being requested by applicant. Please see the attached application report and site plan for complete details.

 If located in an identified Mixed-Use Activity Center area, contain the appropriate mix, size and density of land uses consistent with the Mixed-Use district policies (7.1a, b)?

The project is located in the DTMU and will follow the guidelines for development.

 If located Downtown:

o Integrate an appropriate mix and density of uses (8.1a, e)?

The project will contain apartment units only

o Include buildings at the appropriate scale for the applicable Downtown Character Area (8.1b)?

The project meets the standards for downtown development

o Incorporate appropriate public spaces, plazas and other amenities (8.1d)?

The project provides public spaces, plazas and amenities consistent with the DTMU district

✔ Incorporate a mix of housing models and densities appropriate for the project location and size (9.1a)?

The project will offer a mix of studio, one bedroom and two bedroom apartments, some with lofts, that will appeal to a wide demographic.

CHAPTER 7: A CONNECTED CITY

The Carson City Master Plan seeks promote a sense of community by linking its many neighborhoods, employment areas, activity centers, parks, recreational amenities and schools with an extensive system of interconnected roadways, multi-use pathways, bicycle facilities, and sidewalks.

Is or does the proposed amendment:

✔ Promote transit-supportive development patterns (e.g. mixed-use, pedestrian-oriented, higher density) along major travel corridors to facilitate future transit (11.2b)?

The project is located along existing streets and is close to major arterials. The site is therefore suitable for accessing public transit and for pedestrian travel.

✔ Maintain and enhance roadway connections and networks consistent with the Transportation Master Plan (11.2c)?

The project is accessed by the existing roadway network and provides development close to major arterial roadways.

 Provide appropriate pathways through the development and to surrounding lands, including parks and public lands, consistent with the Unified Pathways Master Plan and the proposed use and density (12.1a, c)?

The project is not located near any parks or public lands and is too small to impact local trails or pathways.

2. Will not be detrimental to the use, peaceful enjoyment, economic value, or development of surrounding properties or the general neighborhood; and is compatible with and preserves the character and integrity of adjacent development and neighborhoods or includes improvements or modifications either on-site or within the public right of way to mitigate development related to adverse impacts such as noise, vibrations, fumes, odors, dust, glare or physical activity.

A. Describe the general types of land uses and zoning designations adjoining your property.

Our property is located within the DTMU and is an infill site. The property is completed bordered by existing commercial and retail development. Along William St to the north is an office/retail building and specialty metals manufacturing business. Along Plaza Street to the east are several retail buildings, the Hardman House Hotel and the Childrens Museum. Along Washington St to the south is an office building and along Stewart St to the east is a retail center, fast food and church building.

B. Explain why your project is similar to existing development in the neighborhood, and why it will not hurt property values or cause problems such as noise, dust, odors, vibration, fumes glare or physical activity, etc.

We intend to construct a 5 building, 207-unit apartment complex on the subject property. This will be the only new construction to occur in this area in some time. As such this project will be constructed with modern materials and finishes consistent with the objective of the DTMU district. The physical appearance of the project will be attractive as this is intended to be a Class A project and the nicest in Carson City. To help blend with the existing buildings we have added brick and stone accenting to retain the historical character of the area. We expect this project to have a positive impact on property values and retail sales within the immediate trade area. We are unaware of any other new apartments that are approved or in planning adjacent to our site.

C. Provide a statement explaining how your project will not be detrimental to the use, peaceful enjoyment or development of surrounding properties and the general neighborhood.

Our project will bring much needed housing to the downtown area. Most of this property is a vacant dirt lot. The addition of 207 apartment units will create additional activity and customers for the businesses in this area. Property taxes and values will rise as a result of our project.

D. If outdoor lighting is to be a part of the project, please indicate how it will be shielded from adjoining property and the type of lighting provided.
Lighting will be provided as required by Carson City development standards. Any pedestrian oriented lighting and street lighting will be designed and shielded in such a manner to minimize impact on neighboring properties. Any lighting on the interior of the project will be shieled by the building structures and should not have an impact on the surrounding properties.

E. Describe the proposed landscaping, including screening and arterial landscape areas (if required by the zoning code). Include a site place with existing and proposed landscape shown on the plan which complies with City ordinance requirements.

A landscape plan was submitted with this application and complies with all Carson City requirements. On certain street frontages our landscape plan substantially exceeds the minimum code requirements.

F. Explain any short range and long range benefit to the people of Carson City that will occur if your project is approved.

This project will provide much needed housing to the downtown Carson City area. The addition of several hundred residents to the downtown area will have an immediate and long range positive impact on the commercial and retail businesses in the area. The site is currently a vacant dirt lot and is visually unappealing. Our project will be constructed to the highest standards and set a new standard for luxury residential living in Carson City. Property taxes and sales taxes will increase once the project is completed.

3. Will have little or no detrimental effect on vehicular or pedestrian traffic.

The project will have little impact on vehicular and pedestrian traffic. As this is a residential project, only residents and their guests will contribute to traffic generation at the site. See included traffic study for a full traffic impact analysis.

4. Will not overburden existing public services and facilities, including schools, police and fire protection, water, sanitary sewer, public roads, storm drainage and other public improvements.

A. How will your project affect the school district? Will your project add to the student population or will it provide a service to the student population?

We do not anticipate a material increase in the student population from our project. At 207 units our project is small and we expect the majority of renters to be single professionals or retirees without any school age children. Furthermore, we expect a large percentage of renters to come from within Carson City so the impact on schools is already accounted for.

B. How will your project affect police and fire protection?

As mentioned above, we anticipate the majority of renters to come from within Carson City so there should be very little added impact on police and fire. Our research indicates that there is substantial unmet demand from renters within Carson City looking for new apartment properties. The project is located approximately 1 mile from Fire Station #51 which is the main fire station in Carson City. The Carson City Sheriffs Office is located less than a mile from the project site.

C. Is the water supply serving your project adequate to meet your needs without degrading supply and quality to others in the area? Is there adequate water pressure? Are the lines in need of replacement? Is your project served by a well?

An Intent to Server Letter was provided by Carson City Public Works for both sewer and water. Based on the contents of the letter, the results of the Major Project Review process, and our understanding of Carson City's water system, the existing infrastructure is adequate to serve the proposed project. Further review and analysis will be provided at the time of final design to confirm this understanding.

The project is surrounded by existing public water mains and one main crossing through the property from west to east. The main crossing through the property will be relocated through the site within an easement. The alignment will not only benefit the site for service taps and a proposed fire hydrant, but will also provide Carson City Public Works with adequate access to their main and minimize congestion of underground utilities in the already-busy streets.

Plaza Street is the only street adjoining the project boundary that does not have water main along the entire length of the project frontage. Therefore, in accordance with Carson City Code, the project proposes water main extensions within Plaza Street to Washington and William Streets.

There are no known wells on the property and no new wells proposed.

D. If your project will result in the covering of land area with paving or a compacted surface, how will drainage be accommodated?

The existing site is comprised of a mix between fully developed property and vacant land with hard-packed earth. Development of the site will generate some increase in runoff; therefore, underground detention is proposed in the parking lot at the southeast corner, which is the low side of the property. The underground detention will connect to the existing public storm drain network in Washington street, which is where the majority of the site currently drains.

For a full discussion on the existing drainage condition and proposed development plan, reference the Preliminary Drainage Study included with the SUP submittal.

E. Is there adequate capacity in the sewage disposal trunk line that you will connect to in order to serve your project, or is your site on a septic system?

There is no known septic system currently on the site and no septic system is proposed with the project.

An evaluation of the downstream sewer system has been conducted. The results of the analysis are included in the Preliminary Sewer Study included with the SUP submittal. In summary, there are multiple existing public sewer mains near and on the property. The project proposes to utilize two of the nearby mains with anticipated flows that fall within the existing estimated capacity of the system.

F. What kind of road improvements are proposed or needed to accommodate your project?

The project is surrounded on four sides by existing public roads. The following is a brief summary of the improvements proposed on each.

- William Street improvements include the addition of a 10-foot wide sidewalk at the back of existing curb, replacement of the existing curb ramp at William & Plaza to meet current code conditions, and replacement of existing curb and gutter to remove a driveway entrance.

- Stewart Street improvements include an 8-foot wide sidewalk with a 5-foot wide landscape buffer between the sidewalk and existing curb, a street light at the project entrance, and replacement of curb and gutter with a valley gutter at the project entrance.

- Washington Street improvements include a 10-foot wide sidewalk with a 5-foot landscape buffer between the sidewalk and existing curb, street lights in accordance with the future lighting plan, and replacement of existing curb and gutter to remove a driveway entrance.

- Plaza Street improvements include an 8-foot wide sidewalk with a 5-foot wide landscape buffer between the sidewalk and existing curb, replacement of curb and gutter to remove driveway entrances, replacement of curb and gutter to add an emergency access driveway, and half street repaving on the east side of Plaza.

G. Indicate the source of the information that you are providing to support your conclusions and statements made in this application.

The information provided with this SUP submittal came from several sources. Below is a list for reference.

- Carson City Development Standards and associated codes.
- Carson City Public Works Intent to Serve Letter dated July 7, 2021
- Major Project Review comment letter from Carson City dated August 13, 2021
- Coordination with Carson City Planning, Engineering, and Public Works Departments on multiple occasions
- Wood Rodgers, Inc. engineering firm utility and storm drain evaluation

5. Meets the definition and specific standards set forth elsewhere in Carson City Municipal Code, Title 18 for such particular use and meets the purpose of that district.

   The project is located within the Downtown Mixed-Use District. The purpose of this district is to encourage a mix of residential, retail, restaurant and commercial uses. As mentioned previously, applicant is seeking to build only residential units and this is one of the items that is triggering the need for a Special Use Permit. We strongly believe that this project will provide a greater benefit to Carson City if constructed as a purely residential project. The need for additional housing greatly outweighs the need for additional commercial or retail space. The project is bordered on all four sides by existing retail and commercial uses. The existing buildings on the project site are retail and there is high levels of vacancy in these buildings. Additional retail space is not justified in this area. Aside from the other waivers that are being requested in this application, the project fully complies with the standards set forth in the Carson City Municipal Code.

6. Will not be detrimental to the public health, safety, convenience and welfare.

   The project will not have any negative impact to the public or surrounding communities.

7. Will not result in material damage or prejudice to other property in the vicinity, as a result of proposed mitigation measures.

   The project will not cause any damage to any other property in the vicinity. All construction will be contained within the project site and no mobilization or staging will impact any of the surrounding properties. This project will have a positive impact on properties within the vicinity, particularly local businesses who will benefit from the increased customer base.

Master Plan Policy Checklist – Major Project Review

Consistent with Carson City Special Use Permit application requirements, this section is taken directly from Carson City documents and forms part of the application process. Responses to the checklist questions are included in this section and are printed in bold type.

DEVELOPMENT CHECKLIST

The following five themes are those themes that appear in the Carson City Master Plan and which reflect the community's vision at a broad policy level. A check mark indicates that the proposed amendment meets the applicable Master Plan policy.

CHAPTER 3: A BALANCED LAND USE PATTERN

The Carson City Master Plan seeks to establish a balance of land uses within the community by providing employment opportunities, a diverse choice of housing, recreational opportunities, and retail services.

✔ Meet the provisions of the Growth Management Ordinance (1.1d, Municipal Code 18.12)?

This project meets the provisions of the Growth Management Ordinance by locating housing in a priority infill area that is adjacent to existing roadways and services. The project will help to better maximize the use of Carson City's infrastructure. Infill residential is encouraged within the Master Plan. The project has convenient access to all community services and major roadways.

✔ Use sustainable building materials and construction techniques to promote water and energy conservation (1.1e and f)?

The project will include modern insulation materials, window frames and exterior finishes that reduce energy use. Landscaping will be designed to minimize water use. Exact specifications of materials will be further defined as building plans are submitted to Carson City.

✔ Located in a priority infill development area (1.2a)?

The project site is located in a priority infill area

✔ Provide pathway connections and easements consistent with the adopted Unified Pathways Master Plan and maintain access to adjacent public lands (1.4a)?

The project is and will be accessible from all sides. No public lands are adjacent to the project

Protect existing site features including mature trees and other character-defining features (1.4c)?

There are no mature trees or other defining features on the property.

At adjacent county boundaries or adjacent to public lands, coordinated with the applicable agency with

regards to compatibility, access, and amenities (1.5a,b)?

The site is not located along a county boundary.

☐ In identified Mixed-Use areas, promote mixed-use development patterns as appropriate for the surrounding context consistent with the land use descriptions of the applicable Mixed-Use designation, and meet the intent of the Mixed-Use Evaluation Criteria (2.1b, 2.2b, 2.3b, Land Use Districts, Appendix C)?

The site is located within the DTMU zoning district and will follow the guidelines. The project site is surrounded by commercial and retail uses and therefore will not include any commercial component.

✔ ☐ Meet adopted standards for transitions between non-residential and residential zoning districts (2.1d)?

The project is located within the DTMU and does not abut to any residential zoning districts

☐ Protect environmentally sensitive areas through proper setbacks, dedication, or other mechanisms (3.1b)?

There are no environmentally sensitive areas on the site.

✔ ☐ Sited outside the primary floodplain and away from geologic hazard areas or follow the required setbacks or other mitigation measures (3.3d, e)?

The site is not located in a floodzone and is set apart from any hazard areas. Setbacks will be incorporated into the project design as mandated by Carson City development standards

✔ ☐ Provide for levels of services (i.e. water, sewer, road improvements, sidewalks, etc) consistent with the Land Use designation and adequate for the proposed development (Land Use table descriptions)?

The site is already served by all utilities and city services. No material impact on existing services is to be expected.

☐ If located within an identified Specific Plan Area (SPA), meet the applicable policies of that SPA (Land Use Map, Chapter 8)?

The site is located within the DTMU and will follow its policies and guidelines, except for any waivers being requested under this application

CHAPTER 4: EQUITABLE DISTRIBUTION OF RECREATIONAL OPPORTUNITIES

The Carson City Master Plan seeks to continue providing a diverse range of park and recreational opportunities to include facilities and programming for all ages and varying interests to serve both existing

and future neighborhoods.

Is or does the proposed amendment:

✔ Provide park facilities commensurate with the demand created and consistent with the City's adopted standards (4.1b)?

The project will provide recreational amenities on site. This includes outdoor seating areas, walking paths, pool area and a clubhouse.

✔ Consistent with the Open Space Master Plan and Carson River Master Plan (4.3a)?

The site is consistent with the Open Space Master Plan and has no impact on the River Master Plan.

CHAPTER 5: ECONOMIC VITALITY

The Carson City Master Plan seeks to maintain its strong diversified economic base by promoting principles which focus on retaining and enhancing the strong employment base, include a broader range of retail services in targeted areas, and include the roles of technology, tourism, recreational amenities, and other economic strengths vital to a successful community.

Is or does the proposed amendment:

✔ Encourage a citywide housing mix consistent with the labor force and non-labor force populations (5.1j)

This project directly promotes this policy by adding additional housing close to existing employment centers.

Encourage the development of regional retail centers (5.2a)

This project does not include any retail but it does support existing retail operations by locating potential customers close to businesses.

✔ Encourage reuse or redevelopment of underused retail spaces (5.2b)?

By adding potential customers close to existing businesses, this project could be seen as encouraging local retail.

Support heritage tourism activities, particularly those associated with historic resources, cultural institutions and the State Capitol (5.4a)?

There is little ability for this application to either negatively or positively affect heritage tourism activities in a material way.

✔ Promote revitalization of the Downtown core (5.6a)?

This project will directly promote revitalization of the Downtown core by adding 207 dwelling units to the downtown area. Businesses in downtown will benefit from the increased population created by this project.

✔ Incorporate additional housing in and around the Downtown, including lofts, condominiums, duplexes, live-work units (5.6c)?

As the proposed project is located in the Downtown Mixed Use District, it directly addresses this need.

CHAPTER 6: LIVABLE NEIGHBORHOODS AND ACTIVITY CENTERS

The Carson City Master Plan seeks to promote safe, attractive and diverse neighborhoods, compact mixed-use activity centers, and a vibrant, pedestrian-friendly Downtown.
Is or does the proposed amendment:

✔ Use durable, long-lasting building materials (6.1a)?

The project will be constructed with modern building methods and materials. We intend to hold this project for the long-term and will be built in a manner consistent with long term ownership.

✔ Promote variety and visual interest through the incorporation of varied building styles and colors, garage orientation and other features (6.1b)?

The included image board exhibit shows that the project will provide contemporary new buildings with articulation, private balconies, and natural colors.

✔ Promote variety and visual interest through the incorporation of well-articulated building facades, clearly identified entrances and pedestrian connections, landscaping and other features consistent with the Development Standards (6.1c)?

The included elevation exhibits show that the proposed buildings are articulated and provide visual appeal. Pedestrian pathways and entrances will be obvious and well-marked. Generous open space and site landscaping will allow for an attractive site.

✔ Provide appropriate height, density and setback transitions and connectivity to surrounding development to ensure compatibility with surrounding development for infill projects or adjacent to existing rural neighborhoods (6.2a, 9.3b 9.4a)?

The project will be complementary to surrounding development in terms of height, setbacks, and use and will therefore be directly compatible. The project conforms to the setback requirements for downtown development. Please see the attached application report and site plan for complete details.

☐ If located in an identified Mixed-Use Activity Center area, contain the appropriate mix, size and density of land uses consistent with the Mixed-Use district policies (7.1a, b)?

Applicant is requesting a waiver of the retail component and seeks to construct an all-residential apartment project. The project is located in the DTMU and will follow the guidelines for development except for any specific waivers being requested in this application.

☐ If located Downtown:

o Integrate an appropriate mix and density of uses (8.1a, e)?

The project will contain apartment units only

o Include buildings at the appropriate scale for the applicable Downtown Character Area (8.1b)?

Applicant is seeking a waiver of building stepback requirement. The project meets all other standards for downtown development

o Incorporate appropriate public spaces, plazas and other amenities (8.1d)?

The project provides public spaces, plazas and amenities consistent with the DTMU district

✔ ☐ Incorporate a mix of housing models and densities appropriate for the project location and size (9.1a)?

The project will offer a mix of studio, one bedroom and two bedroom apartments that will appeal to a wide demographic.

CHAPTER 7: A CONNECTED CITY

The Carson City Master Plan seeks promote a sense of community by linking its many neighborhoods, employment areas, activity centers, parks, recreational amenities and schools with an extensive system of interconnected roadways, multi-use pathways, bicycle facilities, and sidewalks.

Is or does the proposed amendment:

✔ ☐ Promote transit-supportive development patterns (e.g. mixed-use, pedestrian-oriented, higher density) along major travel corridors to facilitate future transit (11.2b)?

The project is located along existing streets and is close to major arterials. The site is therefore suitable for accessing public transit and for pedestrian travel.

✔ ☐ Maintain and enhance roadway connections and networks consistent with the Transportation Master Plan (11.2c)?

The project is accessed by the existing roadway network and provides development close to major arterial roadways.

 Provide appropriate pathways through the development and to surrounding lands, including parks and public lands, consistent with the Unified Pathways Master Plan and the proposed use and density (12.1a, c)?

The project is not located near any parks or public lands and is too small to impact local trails or pathways.

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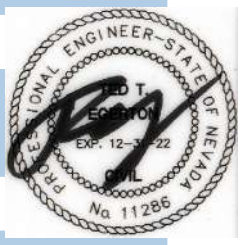
(1960 - 2007)

TRAFFIC STUDY
FOR
ALTAIR APARTMENT COMPLEX

DECEMBER, 2021

Digitally signed by Ted T. Egerton
Date: 2021.12.08 08:38:03-08'00'



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APPENDICES

EXECUTIVE SUMMARY

The proposed Altair Apartment Complex is to be located on the northwest corner of Washington Street and Stewart Street within the Carson City, Nevada. It is anticipated that the project will generate 1,403 daily trips. Of these trips it is anticipated that 88 trips shall occur during the AM peak hour and 110 trips during the PM peak hour.

To offset traffic impacts that are anticipated with the completion of the project, the following recommendations have been made:

- *For the Carson City to require all mandatory signage and striping to be shown on the project's civil engineering drawings and that they conform to the Carson City and MUTCD standards.*

- *For the Developer to install "No Parking" signs on the Washington Street in order to eliminate the existing on street parking on the north side of Washington Street adjacent to the project.*

- *For the Developer to install all proposed driveways per Carson City standards. The developer is to install a stop sign (RI -1) on the access.*

A. SITE AND STUDY AREA BOUNDARIES

The proposed apartment complex shall be located on the northwest corner of Washington Street and Stewart Street within the Carson City, Nevada. Refer to Figure 1 for the Vicinity Map.

In discussions with representatives from Carson City Public Works, it was decided that this report would analyze the following intersections.

Washington Street at Stewart Street
Carson Street at Williams Street
Stewart Street at Williams Street
Roop Street at Williams Street

The rep01i shall include level of service, driveway, and left-turn storage analysis.

Refer to Appendix A for the Carson City traffic study scoping letter.

B. EXISTING AND PROPOSED USES OF THE SITE

The apartment complex is to be located on two separate parcels. The parcels are described as Assessor Parcel Numbers (APN) 002-161-06 and 07.

Currently there are two separate strip retail centers located on the parcels. The proposed use includes the construction of a 207-unit apartment complex.

C. EXISTING AND PROPOSED USES IN THE VICINITY OF THE SITE

West of the site is a Capital City Flats, The Children's Museum of Northern Nevada, a UPS store and Capital Automotive repair.

South of the site is a Federal Office Building.

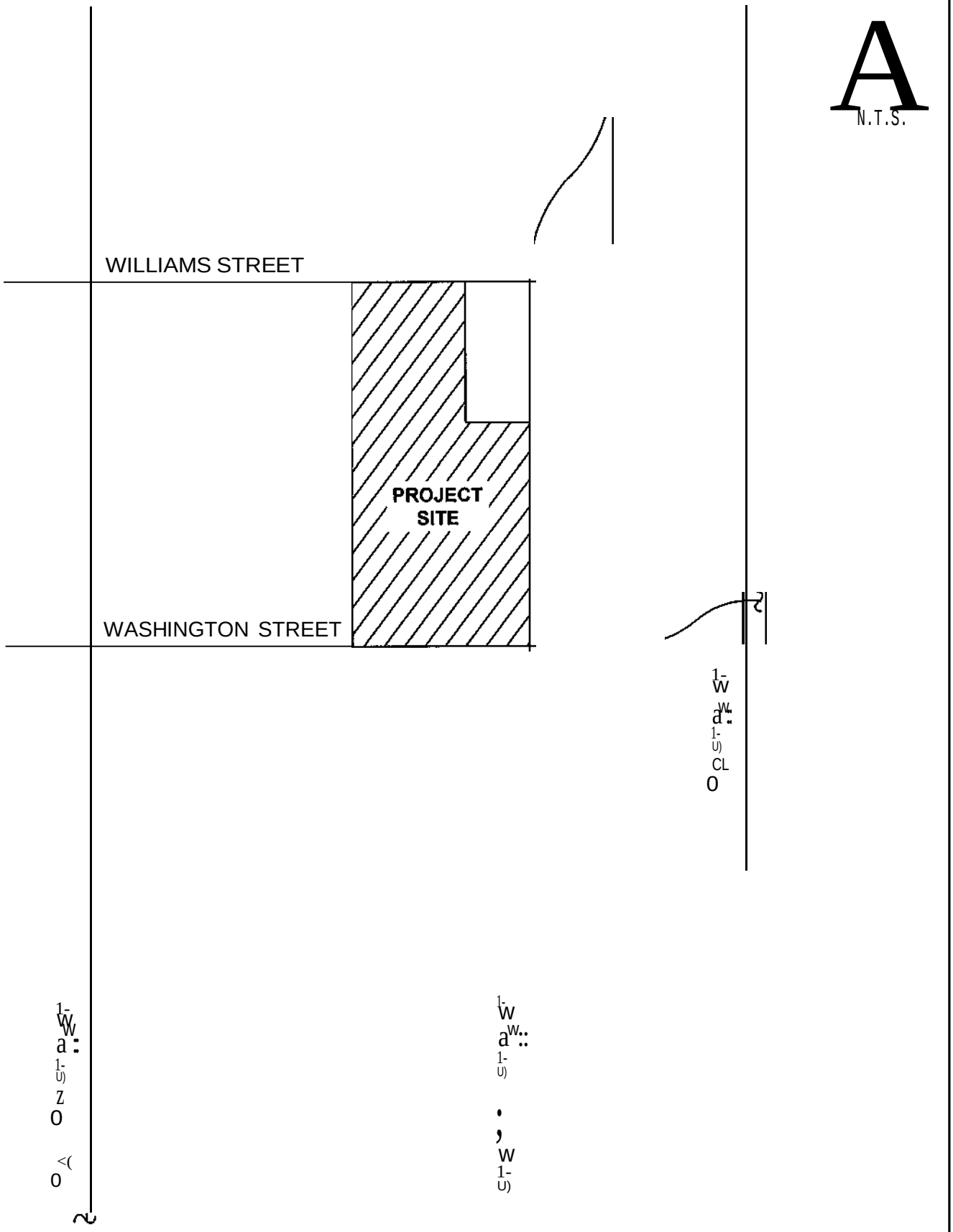
North of the project is an automotive repair center and Valley Real Estate office building.

East of the site is a US Bank Building and The Bridge Church.

D. EXISTING ROADWAYS AND INTERSECTIONS

Roop Street

This north - south roadway consists of two lanes in each direction separated by intermediate left turn bays n01ih of Washington Street. South of Washington Street the roadway consists of one southbound lane and one n01ihbound lane separated by a two way left turn lane. The posted speed limit is 25 miles per hour and bike lanes exists on both sides of the roadway.



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VICINITY MAP
FIGURE 1

SUBJECT SITE AT THE NWC OF WASHINGTON STREET AND STEWART STREET

Stewart Street

This north - south roadway consists of one lane in each direction north of Williams Street South of Williams Street the roadway consists of two travel lanes in each direction. The speed limit is 25 miles per hour and on-street parking is prohibited.

Carson Street

This north - south roadway consists of one lane in each direction separated by a two way left turn lane south of Williams Street. North of Williams Street the roadway consists of two travel lanes in each direction separated by a two way left turn lane. Bike lanes exist on each side of the roadway. The posted speed limit is 25 miles per hour.

Washington Street

This east - west roadway consists of one lane in each direction with intermediate left turn bays. The posted speed limit is 25 miles per hour. On street parking is allowed on section of the roadway adjacent to the project.

Williams Street

This east - west roadway consists of two lanes in each direction separated by a two way left turn lane. The posted speed limit is 25 miles per hour. On street parking is prohibited.

Stewart Street at Williams Street

This four-leg intersection is currently signalized. The north and south legs of Stewait Street consist of an exclusive left turn lane and a through/ right turn lane. The east and west legs of Williams Street exclusive left turn lane, a through lane and a through / right turn lane.

Roop Street at Williams Street

This four-leg intersection is currently signalized. Each leg consists of an exclusive left turn lane, a through lane and a through / right turn lane.

Carson Street at Williams Street

This four-leg intersection is currently signalized. The west leg consists of an exclusive left turn lane and a through / right turn lane. The east leg consists of an exclusive left turn lane, a through lane and an exclusive right turn lane, The north leg consists of an exclusive left turn lane, a through lane and an exclusive right turn lane. The south leg consists of an exclusive left turn lane, a through lane and a through / right turn lane.

Washington Street at Stewaii Street

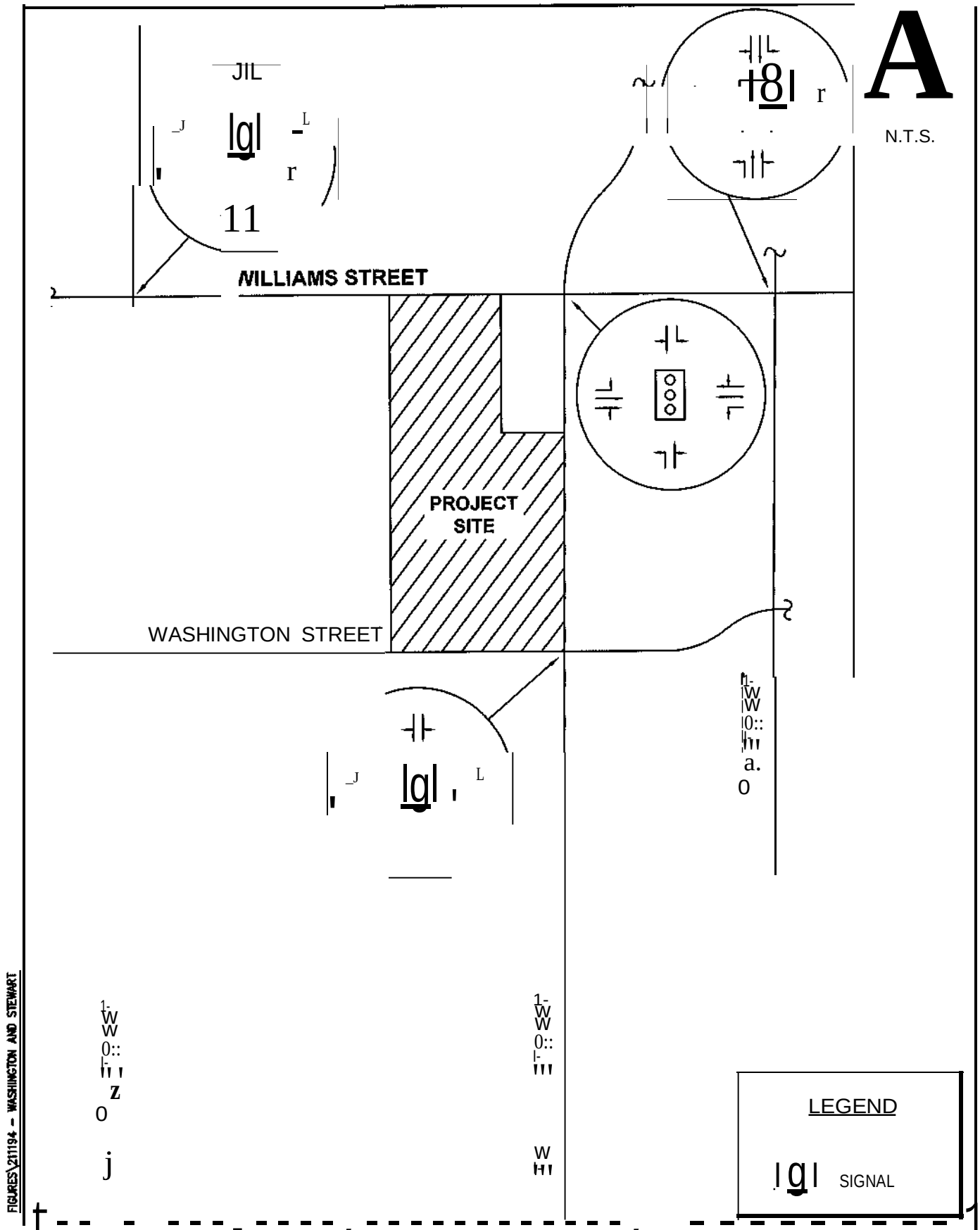
This four-leg intersection is cunently signalized. Each leg consists of an exclusive left turn lane, a through lane / right turn lane.

Existing Lane Configurations are depicted in Figure 2.

E. TRIP GENERATION RATES

Trip generation rates for the proposed development were obtained from the ITE publication entitled *Trip Generation - 1 Jlh Edition.* The independent variable used in the trip generation equations was the number of dwelling units. The trip generation calculations are as follows:

TRIP GENERATION **ITE CODE220** **MULTIFAMILY HOUSING (LOW RISE)** **207 DWELLING UNITS**	
AM PEAK HOUR	
T = 0.31 (X) + 22.85 T = 0.31 (207) + 22.85 T = 87.1 or **88 Trips**	
24% Entering 21 Trips	76% Exiting 67 Trips
PM PEAK HOUR	
T = 0.43 (X) + 20.55 T = 0.43 (207) + 20.55 T = 109.5 or **110 Trips**	
53% Entering 69 Trips	47% Exiting 41 Trips
AVERAGE DAILY TRIPS T = 6.41 (X) + 75.31 T = 6.41 (207) + 75.31 T = 1402.1 or **1403 Trips**	



FIGURES\211194 - WASHINGTON AND STEWART

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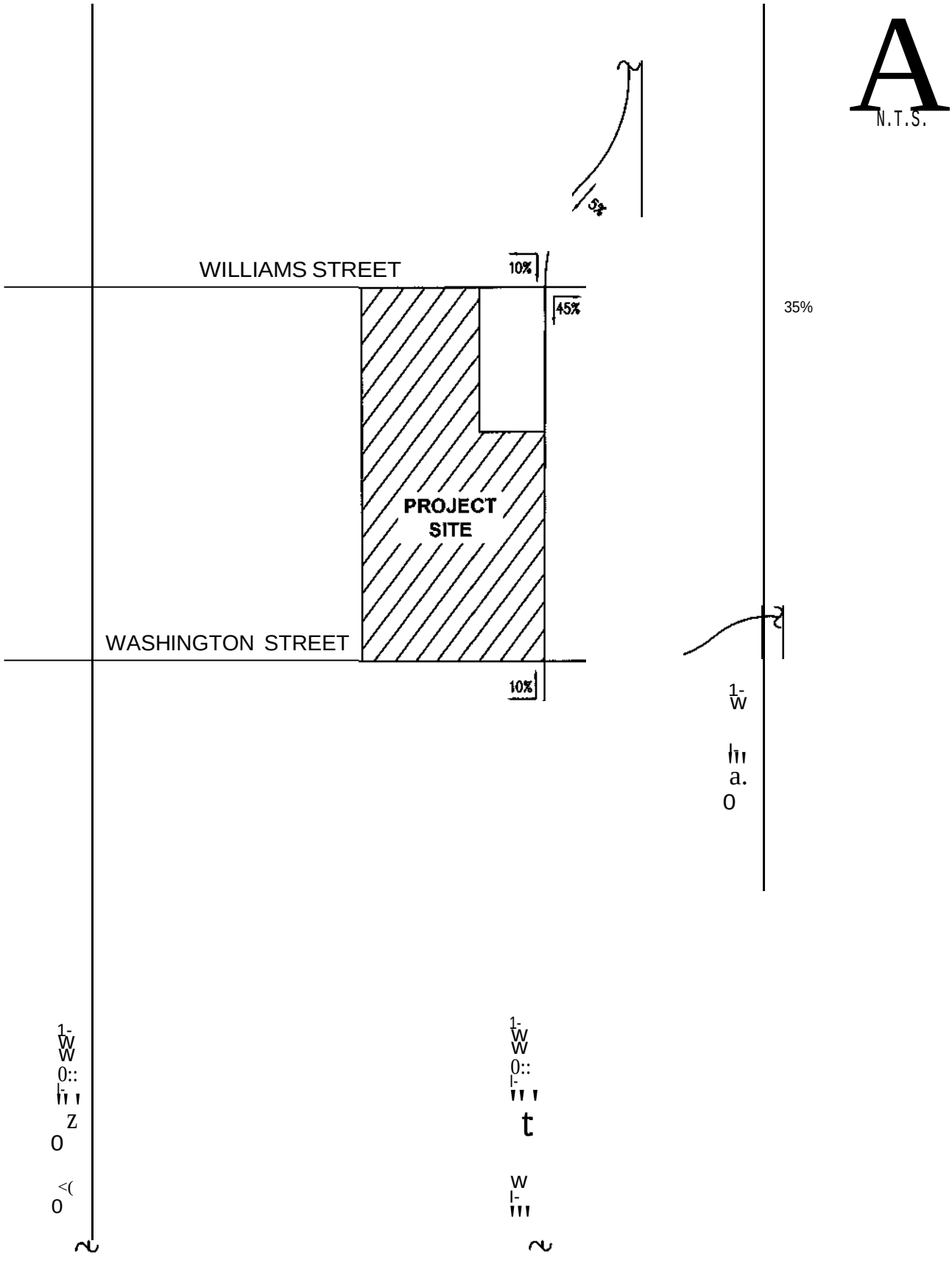
EXISTING LANE CONFIGURATION
FIGURE 2

SUBJECT SITE AT THE NWC OF **WASHINGTON** STREET AND **STEWART** STREET



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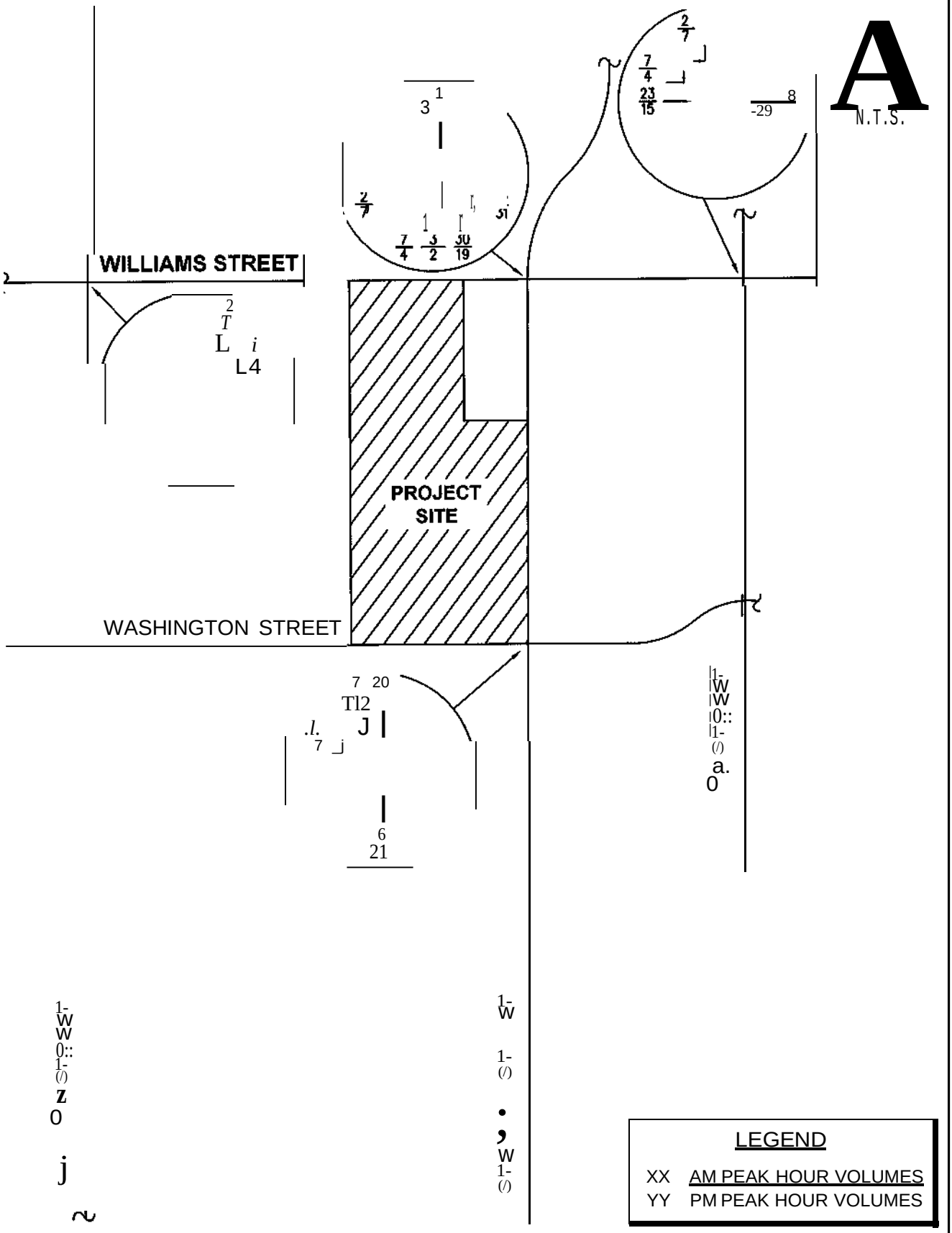
TRIP DISTRIBUTION
FIGURE 3

SUBJECT SITE AT THE NWC OF WASHINGTON STREET AND STEWART STREET



FIGURES\211194 - WASHINGTON AND STEWART

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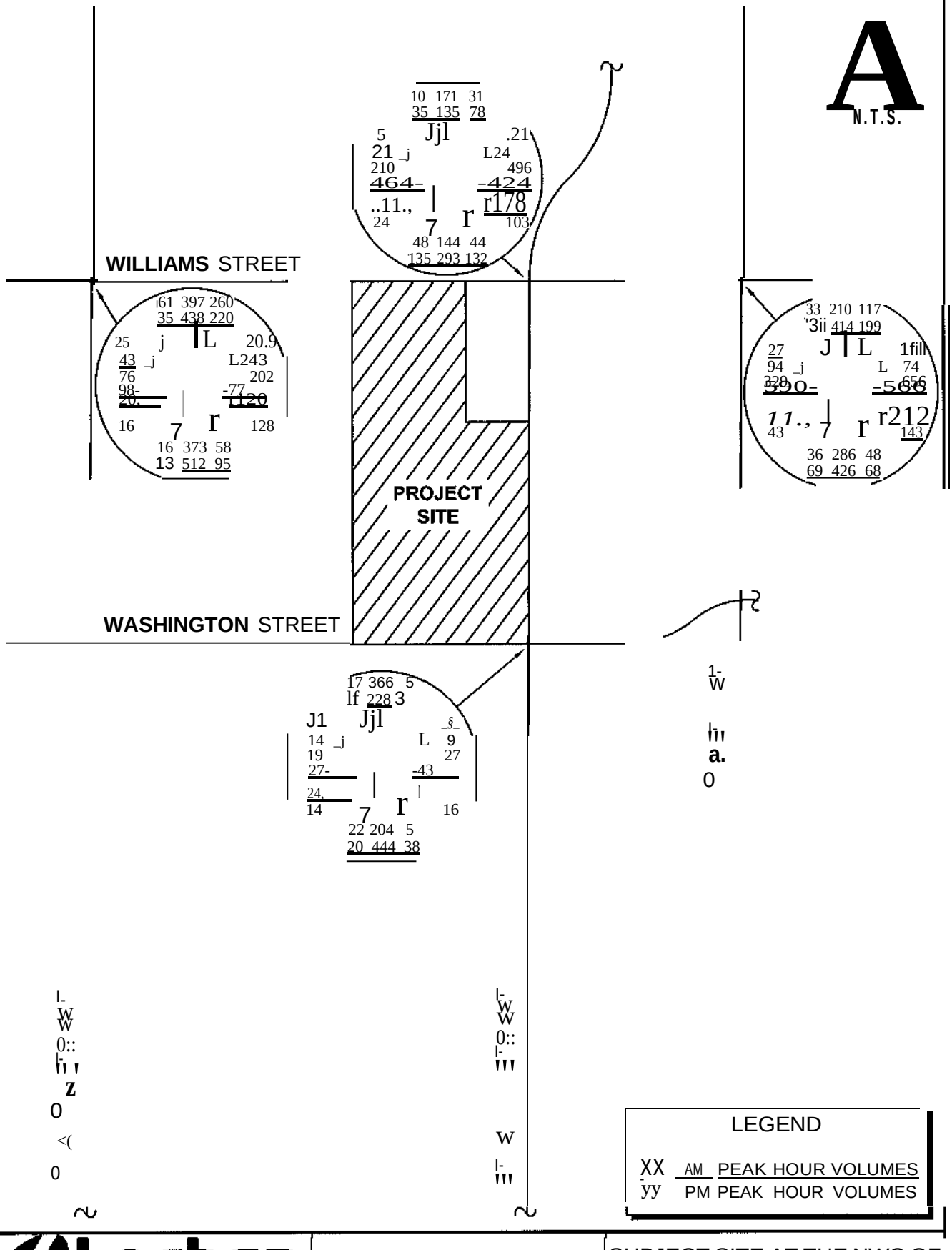
TRIP ASSIGNMENT
FIGURE 4

SUBJECT SITE AT THE NWC OF WASHINGTON STREET AND STEWART STREET



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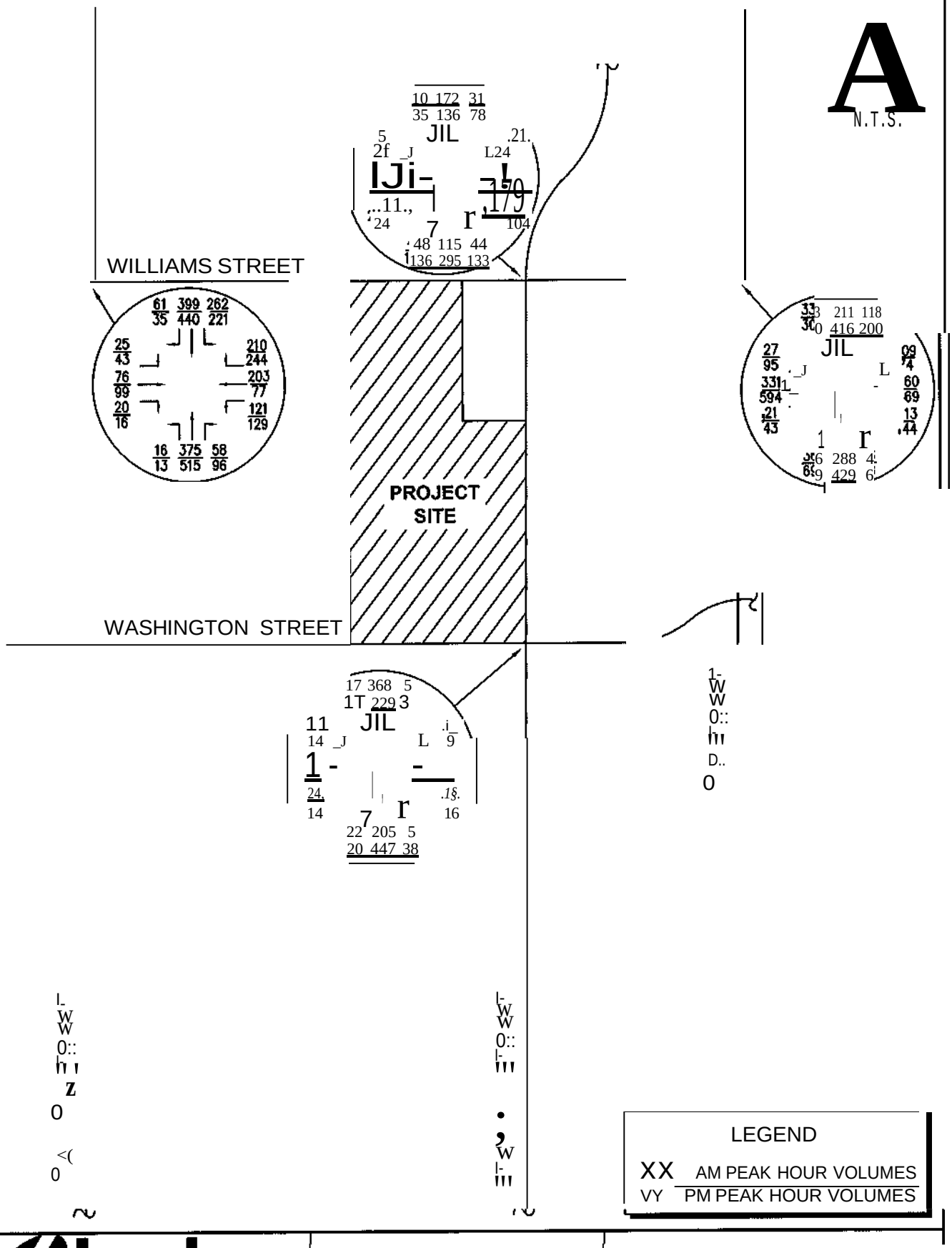
EXISTING VOLUMES
FIGURE 5

SUBJECT SITE AT THE NWC OF **WASHINGTON** STREET AND **STEWART** STREET



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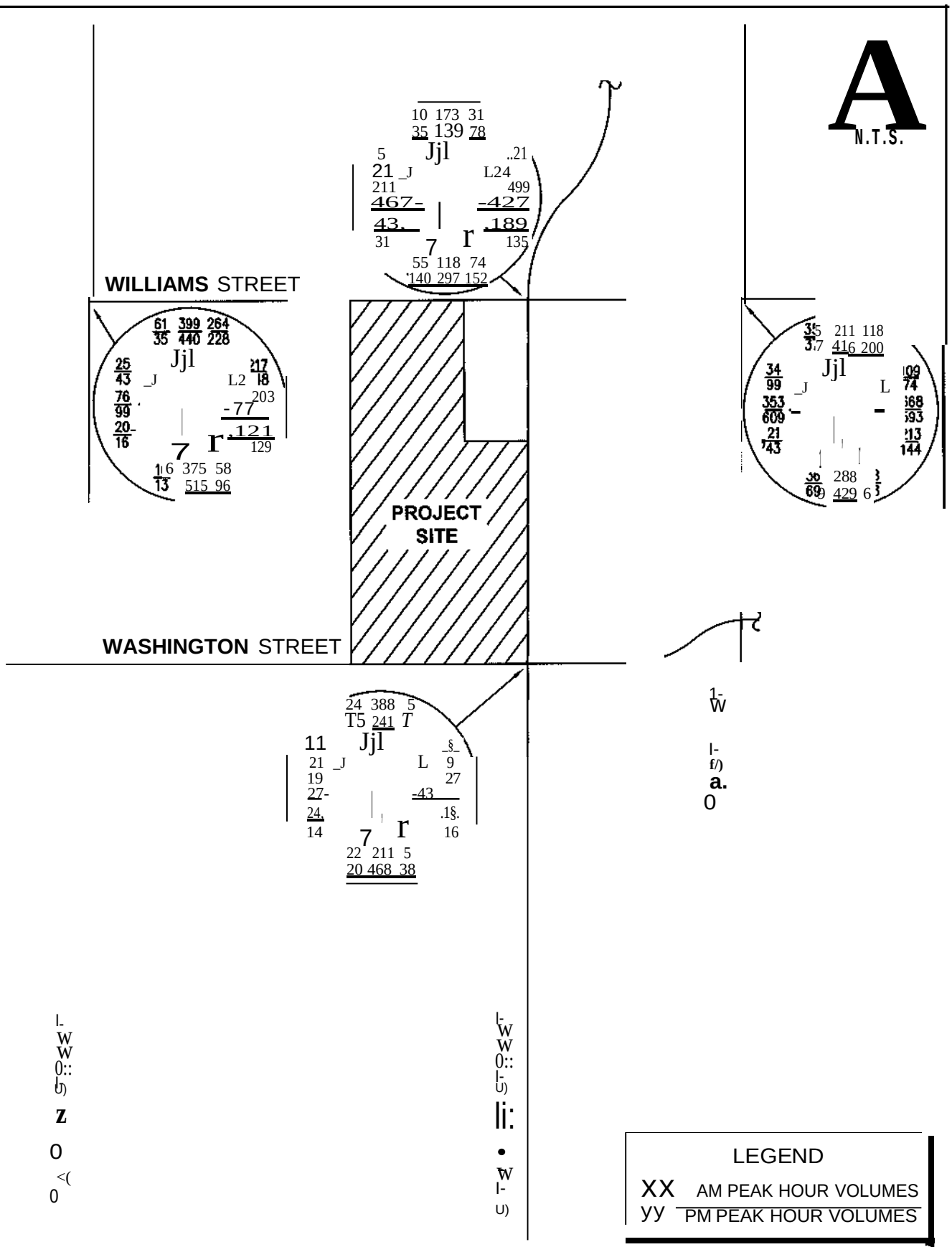
2022 BACKGROUND VOLUMES
FIGURE 6

SUBJECT SITE AT THE NWC OF WASHINGTON STREET AND STEWART STREET



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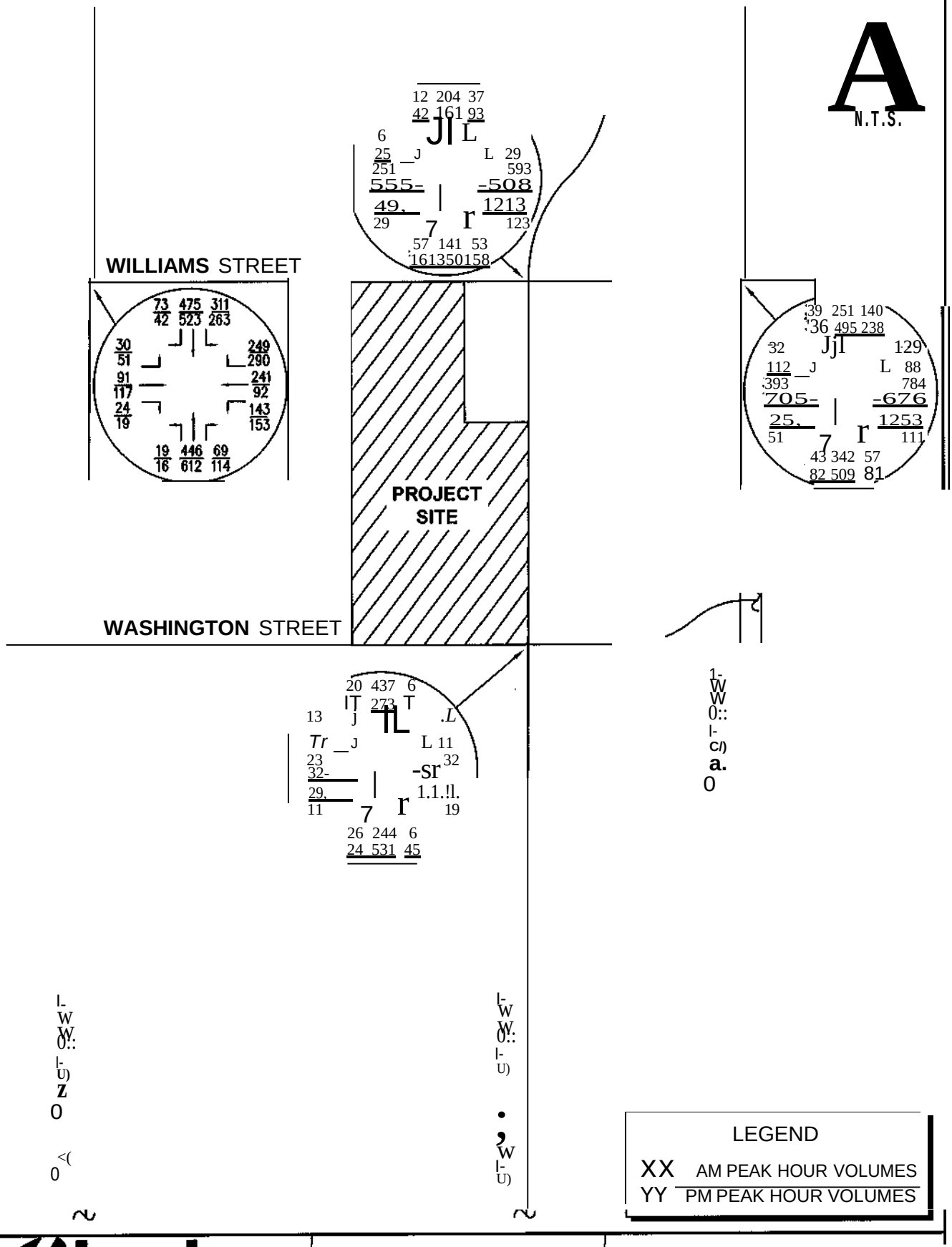
2022 BACKGROUND & PROJECT VOLUMES
FIGURE 7

SUBJECT SITE AT THE NWC OF **WASHINGTON** STREET AND **STEWART** STREET



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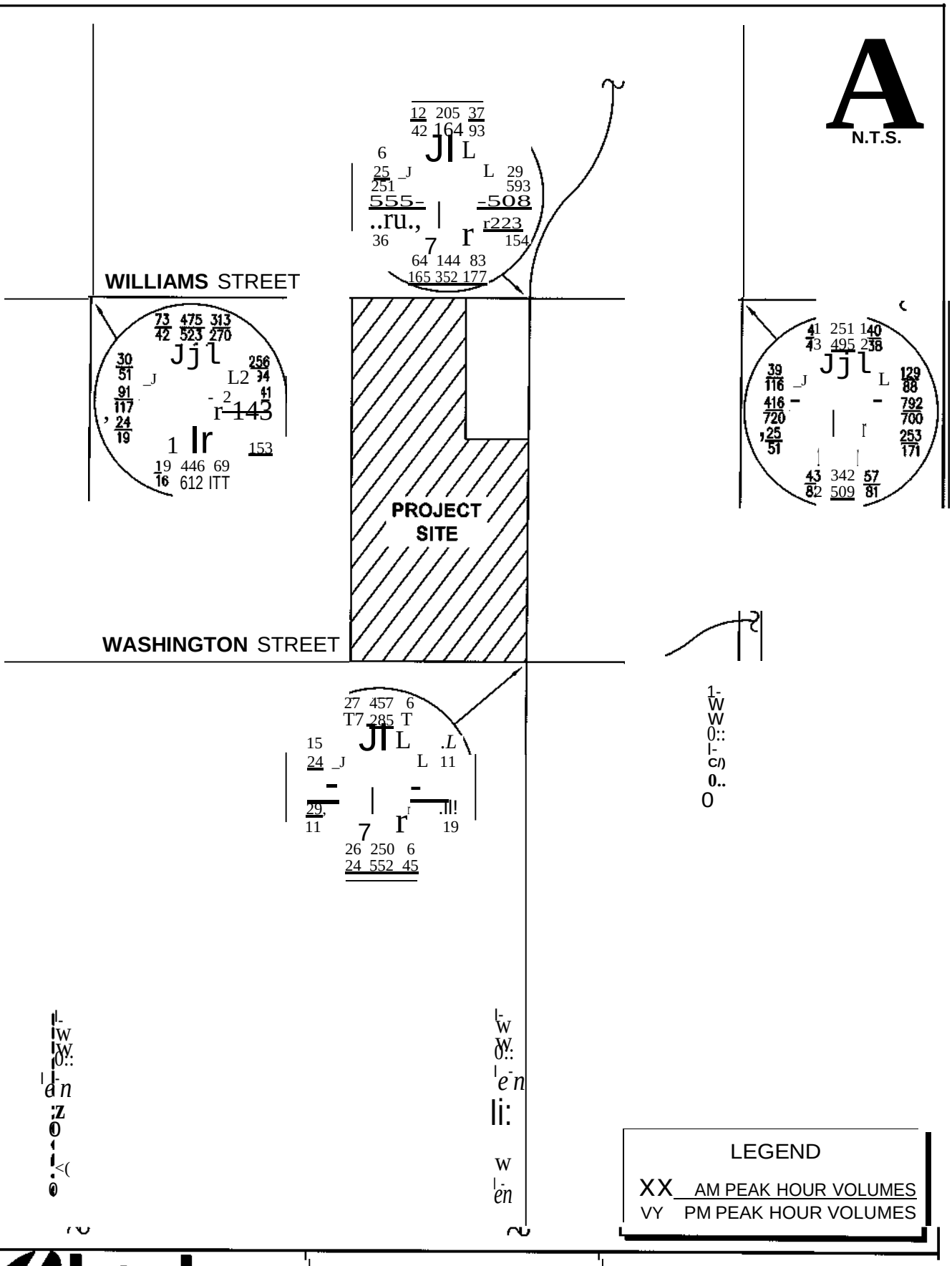
2050 BACKGROUND VOLUMES
FIGURE 8

SUBJECT SITE AT THE NWC OF WASHINGTON STREET AND STEWART STREET



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2050 BACKGROUND & PROJECT VOLUMES
FIGURE 9

SUBJECT SITE AT THE NWC OF WASHINGTON STREET AND STEWART STREET

F. TRIP DISTRIBUTION AND TRIP ASSIGNMENTS

The trip distribution was based upon the local roadway network and trip attractors (employment center) within the study area. Refer to Figure 3 for trip distributions.

Trip assignments were calculated using the trip distribution and trip generation information. Refer to Figure 4 for the trip assignments.

G. EXISTING AND PROJECTED TRAFFIC VOLUMES

Traffic volumes at each subject intersection were recorded on the following dates:

Washington Street at Stewart Street	11/18/21
Carson Street at Williams Street	11/18/21
Stewart Street at Williams Street	11/17/21
Roop Street at Williams Street	11/16/21

The volumes were recorded in 15-minute intervals between the hours of 7:00 am to 9:00 am and 4:00 pm to 6:00 pm. The 15-minute volume counts are contained in Appendix B. Refer to Figure 5 for existing volumes.

The anticipated year of project completion is 2022. Due to this completion date, a yearly growth rate was obtained from the data supplied in the 2050 Regional Transportation model. The model indicated that a yearly growth rate of 0.6 percent. This growth rate was applied to the observed volumes to arrive at the 2022 Background Volumes. Refer to Figure 6 for 2022 Background Volumes. The anticipated trips as depicted in Figure were combined with these volumes. Refer to Figure 7 for 2022 Background and Project Volumes.

As indicated in the scoping letter for the study, the target year of 2050 was also reviewed. The same regional model had the growth rate for 2050 at a rate of 19.5 percent. Refer to Figure 8 for 2050 Background Volumes. The project generated volumes were then combined with these volumes. Refer to Figure 9 for 2050 Background and Project Volumes.

H. INTERSECTION ANALYSIS

Based upon the preceding information, a level of service analysis was performed for each intersection. Techniques presented in the Transportation Research Board publication entitled *Highway Capacity* were utilized for this analysis. The analysis worksheets are provided in Appendix C.

SIGNALIZED INTERSECTION WILLIAMS STREET AT STEWART STREET							
		EXISTING VOLUMES		2022 BACKGROUND VOLUMES		2022 BACKGROUND VOLUMES WITH PROJECT	
		AM PEAK	PM PEAK	AM PEAK	PM PEAK	AM PEAK	PM PEAK
EASTBOUND	Level of Service	D	D	D	D	D	D
	Average Delay (Sec)	35.4	47.9	35.5	48.3	35.5	49.2
WESTBOUND	Level of Service	D	D	D	D	D	D
	Average Delay (Sec)	42.0	40.0	42.2	40.1	42.1	39.8
NORTHBOUND	Level of Service	C	F	C	F	C	F
	Average Delay (Sec)	31.8	126.9	31.9	129.6	34.1	151.2
SOUTHBOUND	Level of Service	C	C	C	C	C	C
	Average Delay (Sec)	33.8	32.4	33.8	32.6	33.9	32.8
INTERSECTION	Level of Service	D	E	D	E	D	E
	Average Delay (Sec)	38.0	67.2	38.1	68.2	38.3	75.1

SIGNALIZED INTERSECTION WILLIAMS STREET AT STEWART STREET					
		2050 BACKGROUND VOLUMES		2050 BACKGROUND AND PROJECT VOLUMES	
		AM PEAK	PM PEAK	AM PEAK	PM PEAK
EASTBOUND	Level of Service	D	E	D	E
	Average Delay (Sec)	37.1	63.6	37.2	65.8
WESTBOUND	Level of Service	D	D	D	D
	Average Delay (Sec)	53.1	46.9	53.0	46.7
NORTHBOUND	Level of Service	C	F	C	F
	Average Delay (Sec)	34.0	204.5	36.9	227.5
SOUTHBOUND	Level of Service	D	C	D	C
	Average Delay (Sec)	36.0	34.6	36.1	34.8
INTERSECTION	Level of Service	D	F	D	F
	Average Delay (Sec)	44.5	97.0	44.8	104.8

Williams Street at Stewaii Street

This intersection is experiencing unacceptable delays during the PM peak hour. This is due to a lack of green time for the northbound through / right turn movement. Currently the intersection is running on a pretimed signal patterns. By changing the pattern but keeping the same cycle length the delays may be reduced. The intersections was analyzed with a revised signal pattern which provided additional green time to these movements. The results are as follows:

SIGNALIZED INTERSECTION (MODIFIED WILLIAMS STREET AT STEWART STREET					
		2022 BACKGROUND VOLUMES		2022 BACKGROUND VOLUMES WITH PROJECT MODIFIED	
		AM PEAK	PM PEAK	AM PEAK	PM PEAK
EASTBOUND	Level of Service	D	E	D	D
	Average Delay (Sec)	37.1	63.6	37.2	36.1
WESTBOUND	Level of Service	D	D	D	C
	Average Delay (Sec)	53.1	46.9	53.0	27.3
NORTHBOUND	Level of Service	C	F	C	D
	Average Delay (Sec)	34.0	204.5	36.9	50.0
SOUTHBOUND	Level of Service	D	C	D	C
	Average Delay (Sec)	36.0	34.6	36.1	27.7
INTERSECTION	Level of Service	D	F	D	D
	Average Delay (Sec)	44.5	97.0	44.8	36.6

SIGNALIZED INTERSECTION WASHINGTON STREET AT STEWART STREET							
		EXISTING VOLUMES		2022 BACKGROUND VOLUMES		2022 BACKGROUND VOLUMES WITH PROJECT	
		AM PEAK	PM PEAK	AM PEAK	PM PEAK	AM PEAK	PM PEAK
EASTBOUND	Level of Service	B	B	B	B	B	B
	Average Delay (Sec)	16.9	17.0	16.9	17.0	16.9	17.1
WESTBOUND	Level of Service	B	B	B	B	B	B
	Average Delay (Sec)	16.8	17.0	16.8	17.0	16.8	17.0
NORTHBOUND	Level of Service	A	A	A	A	A	A
	Average Delay (Sec)	8.4	9.7	8.4	9.8	8.5	9.9
SOUTHBOUND	Level of Service	A	A	A	A	A	A
	Average Delay (Sec)	9.1	8.5	9.1	8.5	9.3	8.5
INTERSECTION	Level of Service	A	B	A	B	A	B
	Average Delay (Sec)	10.0	10.4	10.0	10.4	10.0	10.5

SIGNALIZED INTERSECTION WASHINGTON STREET AT STEWART STREET					
		2050 BACKGROUND VOLUMES		2050 BACKGROUND AND PROJECT VOLUMES	
		AM PEAK	PM PEAK	AM PEAK	PM PEAK
EASTBOUND	Level of Service	B	B	B	B
	Average Delay (Sec)	17.1	17.2	17.1	17.3
WESTBOUND	Level of Service	B	B	B	B
	Average Delay (Sec)	17.0	17.2	17.0	17.2
NORTHBOUND	Level of Service	A	A	A	A
	Average Delay (Sec)	8.6	10.3	8.7	10.5
SOUTHBOUND	Level of Service	A	A	A	A
	Average Delay (Sec)	9.4	8.7	9.6	8.7
INTERSECTION	Level of Service	B	B	B	B
	Average Delay (Sec)	10.2	10.8	10.4	10.9

Washington Street at Stewart Street

This intersection is experiencing acceptable delays during both peak hours. This 1s anticipated to continue upon completion of the project.

SIGNALIZED INTERSECTION CARSON STREET AT WILLIAMS STREET							
		EXISTING VOLUMES		2022 BACKGROUND VOLUMES		2022 BACKGROUND VOLUMES WITH PROJECT	
		AM PEAK	PM PEAK	AM PEAK	PM PEAK	AM PEAK	PM PEAK
EASTBOUND	Level of Service	D	D	D	D	D	D
	Average Delay (Sec)	39.8	37.3	39.7	37.3	39.2	37.0
WESTBOUND	Level of Service	D	D	D	D	D	D
	Average Delay (Sec)	38.9	37.7	38.8	37.6	38.4	37.5
NORTHBOUND	Level of Service	B	B	B	C	B	C
	Average Delay (Sec)	18.1	19.8	18.3	19.9	18.7	20.4
SOUTHBOUND	Level of Service	B	B	B	B	B	B
	Average Delay (Sec)	13.6	15.2	13.7	15.3	14.0	15.5
INTERSECTION	Level of Service	C	C	C	C	C	C
	Average Delay (Sec)	23.8	23.7	23.9	23.8	24.0	24.0

SIGNALIZED INTERSECTION CARSON STREET AT WILLIAMS STREET					
		2050 BACKGROUND VOLUMES		2050 BACKGROUND AND PROJECT VOLUMES	
		AM PEAK	PM PEAK	AM PEAK	PM PEAK
EASTBOUND	Level of Service	D	D	D	D
	Average Delay (Sec)	38.0	35.3	37.5	35.0
WESTBOUND	Level of Service	D	D	D	D
	Average Delay (Sec)	37.4	38.1	37.3	38.2
NORTHBOUND	Level of Service	C	C	C	C
	Average Delay (Sec)	24.1	26.7	24.7	27.3
SOUTHBOUND	Level of Service	B	C	B	C
	Average Delay (Sec)	17.7	20.2	18.1	20.5
INTERSECTION	Level of Service	C	C	C	C
	Average Delay (Sec)	26.4	27.7	26.7	28.0

Carson Street at Williams Street

This intersection is experiencing acceptable delays during both peak hours. This 1s anticipated to continue upon completion of the project.

SIGNALIZED INTERSECTION ROOP STREET AT WILLIAMS STREET							
		EXISTING VOLUMES		2022 BACKGROUND VOLUMES		2022 BACKGROUND VOLUMES WITH PROJECT	
		AM PEAK	PM PEAK	AM PEAK	PM PEAK	AM PEAK	PM PEAK
EASTBOUND	Level of Service	D	D	D	D	D	D
	Average Delay (Sec)	36.1	43.6	36.1	43.8	36.5	44.5
WESTBOUND	Level of Service	D	D	D	D	D	D
	Average Delay (Sec)	50.9	43.4	51.4	43.6	52.4	44.9
NORTHBOUND	Level of Service	D	E	D	E	D	E
	Average Delay (Sec)	46.7	57.9	46.8	58.3	46.8	58.3
SOUTHBOUND	Level of Service	D	D	D	D	D	D
	Average Delay (Sec)	39.9	49.9	39.9	50.1	40.0	50.7
INTERSECTION	Level of Service	D	D	D	D	D	D
	Average Delay (Sec)	45.6	48.0	45.9	48.2	46.2	48.9

SIGNALIZED INTERSECTION ROOP STREET AT WILLIAMS STREET					
		2050 BACKGROUND VOLUMES		2050 BACKGROUND AND PROJECT VOLUMES	
		AM PEAK	PM PEAK	AM PEAK	PM PEAK
EASTBOUND	Level of Service	D	D	D	D
	Average Delay (Sec)	37.7	52.0	38.1	53.5
WESTBOUND	Level of Service	E	D	E	E
	Average Delay (Sec)	76.9	52.5	79.0	55.2
NORTHBOUND	Level of Service	D	E	D	E
	Average Delay (Sec)	50.2	76.4	50.2	76.4
SOUTHBOUND	Level of Service	D	E	D	E
	Average Delay (Sec)	41.7	60.3	41.8	61.5
INTERSECTION	Level of Service	E	E	E	E
	Average Delay (Sec)	58.0	59.2	59.8	60.6

Roop Street at Williams Street

This intersection is experiencing excessive delays during the PM peak hour for the northbound movement. This is due to the fixed timing of the signal. Currently the intersection is running on a pretimed signal patterns. By changing the pattern but keeping the same cycle length the delays may be reduced. The intersections was analyzed with a revised signal pattern which provided additional green time to these movements. The results are as follows:

SIGNALIZED INTERSECTION (MODIFIED ROOP STREET AT WILLIAMS STREET					
		2022 BACKGROUND VOLUMES		2022 BACKGROUND VOLUMES WITH PROJECT MODIFIED	
		AM PEAK	PM PEAK	AM PEAK	PM PEAK
EASTBOUND	Level of Service	D	D	D	C
	Average Delay (Sec)	36.1	43.8	36.1	25.4
WESTBOUND	Level of Service	D	D	D	C
	Average Delay (Sec)	51.4	43.6	51.4	23.8
NORTHBOUND	Level of Service	D	E	D	D
	Average Delay (Sec)	46.8	58.3	46.8	54.3
SOUTHBOUND	Level of Service	D	D	D	D
	Average Delay (Sec)	39.9	50.1	39.9	39.2
INTERSECTION	Level of Service	D	D	D	C
	Average Delay (Sec)	45.9	48.2	45.9	34.1

I. DRIVEWAY ANALYSIS

Referring to the enclosed site plan, the project shall have access to the public street network via one driveway on Stewart Street. This access is anticipated to allow full access.

Based upon this information, the anticipated trips were assigned to the access. Refer to Figure 10 for 2022 Driveway Volumes and Figure 11 for 2050 Driveway Volumes.

Due to allowed turning movements the driveway was reviewed with respects to level of service. The level of service worksheets for the driveway are contained in Appendix D. The results are as follows:

UNSIGNALIZED INTERSECTION DRIVEWAY ON STEWART STREET			
		2022 BACKGROUND VOLUMES WITH PROJECT	
		AM PEAK	PM PEAK
EASTBOUND	Level of Service	B	B
	Average Delay (Sec)	12.7	12.6
NORTHBOUND LEFT	Level of Service	A	A
	Average Delay (Sec)	8.3	8.0

UNSIGNALIZED INTERSECTION DRIVEWAY ON STEWART STREET			
		2050 BACKGROUND VOLUMES WITH PROJECT	
		AM PEAK	PM PEAK
EASTBOUND	Level of Service	B	B
	Average Delay (Sec)	13.9	13.7
NORTHBOUND LEFT	Level of Service	A	A
	Average Delay (Sec)	8.5	8.1

Based upon the preceding analyses it is anticipated that the access will operate in an acceptable manner.

J. LEFT-TURN STORAGE ANALYSIS

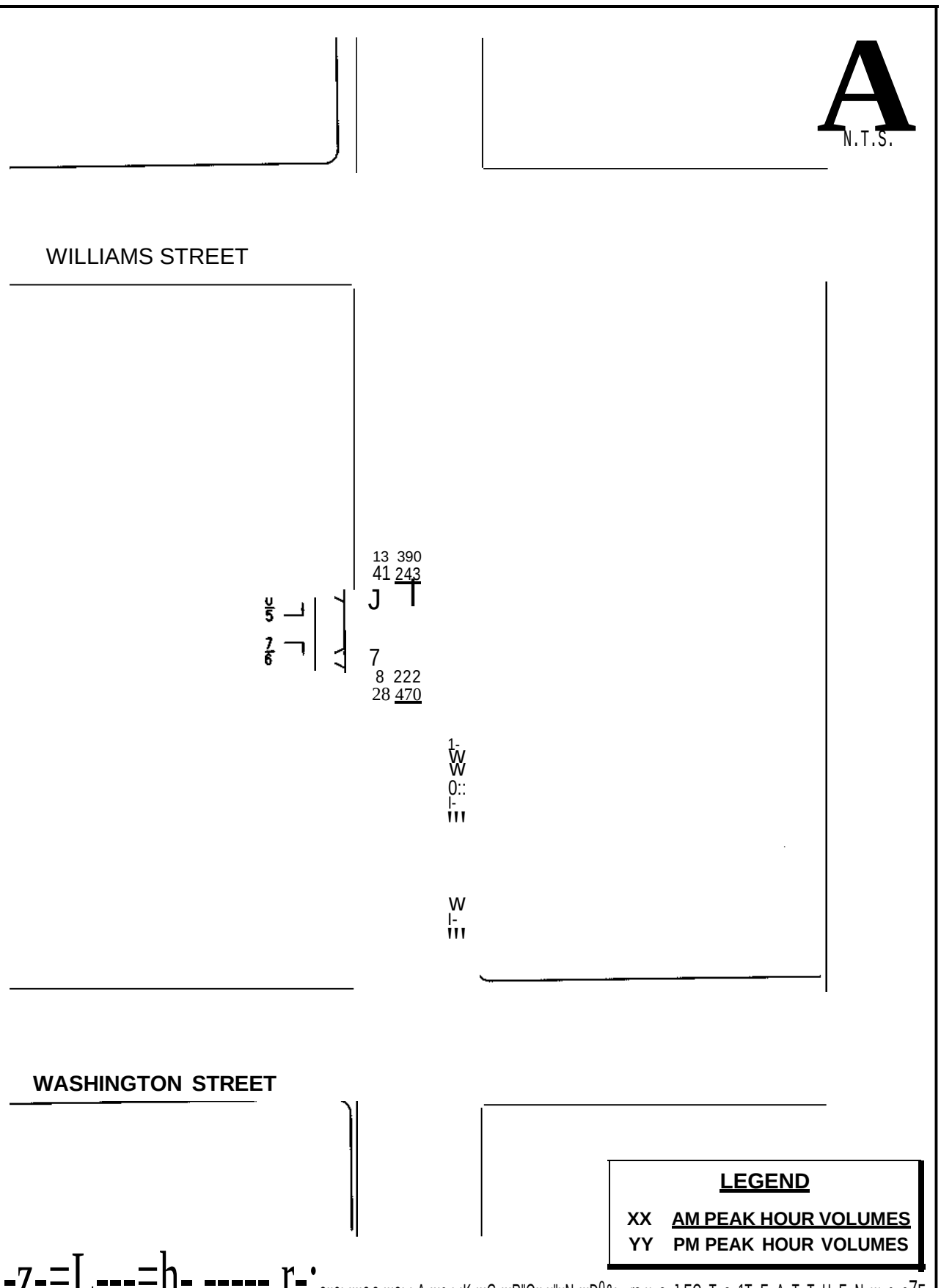
As required by Carson City, left-turn storage bays that are affected by this project must be analyzed for adequate storage lengths. A normal standard distribution was analyzed for the signalized intersection. This methodology has been accepted by the Nevada Department of Transportation. Refer to Appendix E for analysis worksheets.

The results are as follows:

	REQUIRED MINIMUM STORAGE LENGTH	EXISTING STORAGE LENGTH
	PEAKHOUR	
Washington Street at Stewart Street West Leg	50 feet	50 feet
Carson Street at Williams Street North Leg	300 feet	150 feet*
Stewmt Street at Williams Street South Leg	200 feet	Continuous
Stewa1t Street at Williams Street East Leg	250 feet	Continuous*
Roop Street at Williams Street West Leg	175 feet	Continuous

***Two Way Left Turn Lane**

In review of the required storage lengths, the queue for the north leg of Carson Street at Williams Street may encroach into the intersection of Carson Street and John Street. The volumes on the east leg of Williams Street at Stewart Street may encroach into the intersection of Valley Street at Williams Street.



WASHINGTON STREET AND STEWART STREET

FIGURE 10

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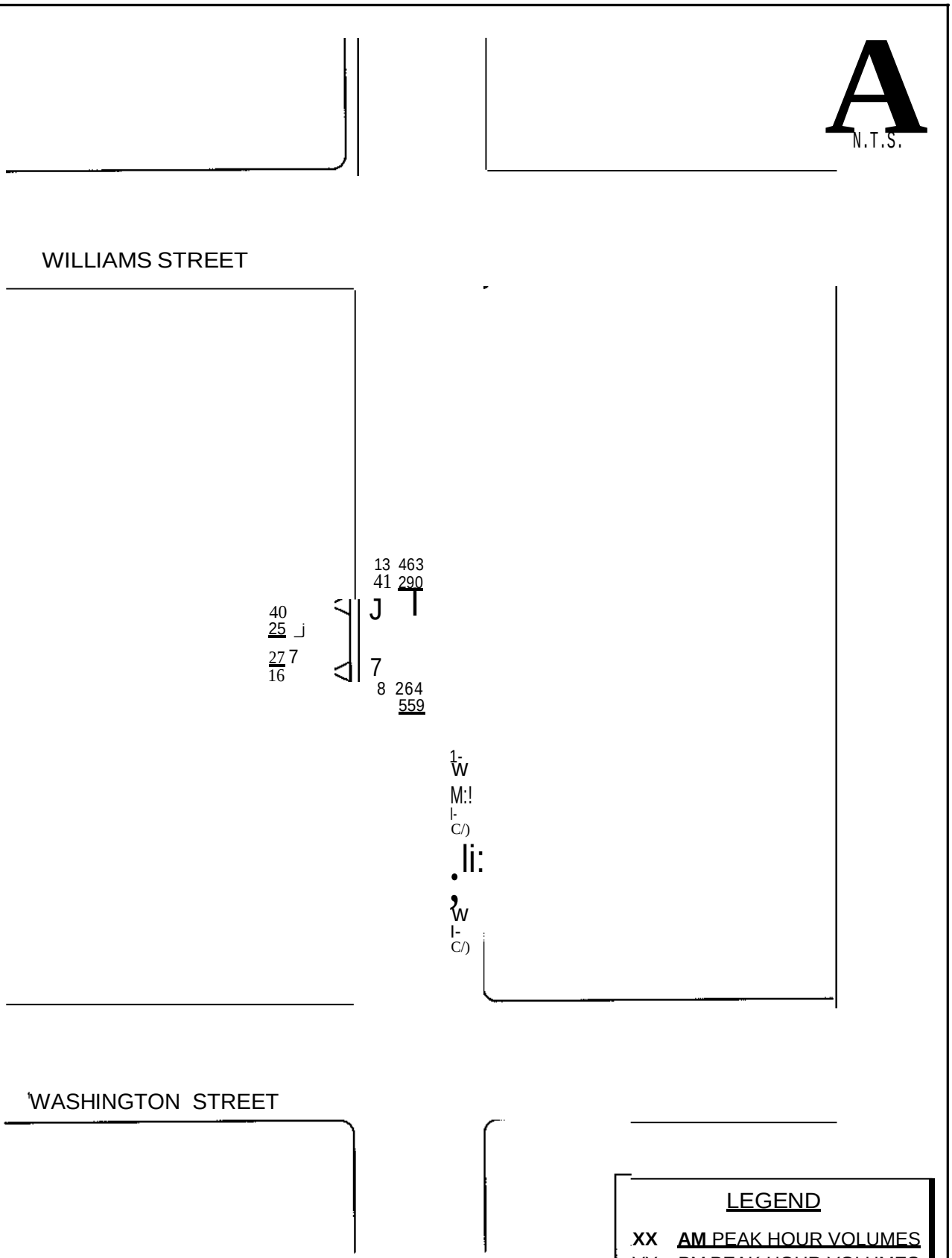

T:\CAD\TED_E\TRAFFIC FIGURES\211194 - WASHINGTON AND STEWART

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2050 BACKGROUND & PROJECT VOLUMES
FIGURE 11

SUBJECT SITE AT THE NWC OF WASHINGTON STREET AND STEWART STREET

K. RECOMMENDATIONS

To offset traffic impacts that are anticipated with the completion of the project, the following recommendations have been made:

- *For the Carson City to require all mandatory signage and striping to be shown on the project's civil engineering drawings and that they conform to the Carson City and MUTCD standards.*

- *For the Developer to install "No Parking" signs on the Washington Street in order to eliminate the existing on street parking on the north side of Washington Street adjacent to the project.*

- *For the Developer to install all proposed driveways per Carson City standards. The developer is to install a stop sign (RI-I) on the access.*

APPENDIX A

Carson City TIA Scope

Assuming the trips generated meet the required threshold:

1) Please evaluate:
   - Existing Conditions:
   - Existing Conditions Plus Project
   - Long-Term Transportation Model with and without project. Carson City has adopted the 2050 Regional Transportation plan and model.

   Please also consider other nearby developments approved but not yet fully operational:

   - None.

2) Please include all phases (if applicable) for the project in the initial TIS.

3) Please show the locations of all proposed driveways and intersections. Driveways and intersections should be spaced in conformance with our Code.

4) Please analyze the LOS for the following intersections at each approach and the overall for each condition above:

   - Project access points (Other intersections to those listed below may be added if the driveway location changes or additional driveways are added on other streets.)
   - William / Stewart
   - William / Carson
   - William / Roop
   - Stewart / Washington

Please evaluate the need for new and length of existing turn pockets at each intersection; both for left-turn and right-turn. The City does not have specific requirements, so please default to NDOT's guidelines, or possibly AASHTO. Please evaluate each intersection in terms of LOS requirements as outlined in Code.

Carson City will provide existing signal timing configurations separately.

5) Please review all existing and planned transit, bicycle, and pedestrian facilities around the site and discuss how this project may affect those modes, as applicable.

6) Trip Generation and Distribution
   - Please provide trip generation for average daily trips (ADT), a.m. peak hour trips (including in and out traffic split), and p.m. peak hour trips (including in and out traffic split) per ITE. (I am okay with either the 10^{th} edition or the 11^{th} edition of the manual.)
   - Provide traffic counts for a typical day, when school is in session, and weather conditions are good. Traffic counts shall not be more than twelve (12) months old.
   - Please review nearby NDOT count stations to ensure the counts collected are reasonable. Conservative is tends to be more defendable.

- Describe trip distribution and methodology for a.m. and p.m. peak periods, and existing and future scenarios evaluated in the traffic study.

7) Please preform the impact analysis and provide any recommended mitigations per Carson City Municipal Code, Title 18 Appendix, Division 12.13.

8) Other:
    - The City is conducting several feasibility studies in this area including the William Street Feasibility Study and the Downtown Transit Center Feasibility Study. These studies are just beginning. I do not believe any action by this development in terms of a traffic impact study is required at this time.

APPENDIXB

15-Minute Volume Counts

Lochsa **Engineering**

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Las Vegas, NV 89044

File Name : **Washington-Stewart**
Site Code : **00000000**
Start Date : **11/18/2021**
Page No : **1**

Grouos Printed- Unshifted

	Stewart Street From North				Washington Street From East				Stewart Street From South				Washington Street From West				
Start Time	Riaht	Thru	Left	Peds	Riaht	Thru	Left!	Peds	Riaht	Thru	Left	Peds	Riaht	Thru	Left	Peds	Int. Total
07:00 AM	4	78	1	0	2	4	4	0	1	49	0	0	6	5	3	0	157
07:15 AM	8	86	1	0	2	9	3	0	0	54	8	0	11	9	5	0	196
07:30 AM	3	103	2	0	0	5	6	0	1	53	9	0	3	3	2	0	190
07:45 AM	2	99	1	0	2	9	2	0	3	48	5	0	4	2	1	0	178
Total	17	366	5	0	6	27	15	0	5	204	22	0	24	19	11	0	721
08:00 AM	4	70	2	0	0	3	2	0	3	42	3	0	3	5	3	0	140
08:15 AM	2	48	1	0	1	6	1	0	0	40	7	0	5	3	1	0	115
08:30 AM	2	55	0	0	3	3	3	0	2	35	3	0	1	2	2	0	111
08:45 AM	2	59	2	0	2	8	2	0	8	59	2	0	2	4	3	0	153
Total	10	232	5	0	6	20	8	0	13	176	15	0	11	14	9	0	519
*** BREAK ***																	
04:00 PM	2	55	2	0	2	8	3	0	10	104	3	0	3	6	3	4	205
04:15 PM	3	60	0	0	2	12	5	0	13	101	2	0	3	13	5	0	219
04:30 PM	2	48	2	0	1	9	5	0	13	112	4	0	2	4	2	0	204
04:45 PM	4	44	1	0	4	12	4	0	5	115	1	0	3	8	5	0	206
Total	11	207	5	0	9	41	17	0	41	432	10	0	11	31	15	4	834
05:00 PM	2	76	0	0	2	10	2	0	7	116	13	0	6	2	2	0	238
05:15 PM	2	65	0	0	1	9	3	0	8	92	9	0	4	7	8	0	208
05:30 PM	3	52	0	0	3	5	8	0	4	73	1	0	2	4	2	0	157
05:45 PM	1	51	1	0	2	5	0	0	7	57	4	0	1	2	0	0	131
Total	8	244	1	0	8	29	13	0	26	338	27	0	13	15	12	0	734
Grand Total	46	1049	16		29	117	53		85	1150	74		59	79	47		2808
Apprch %	4.1	94.4	1.4		14.6	58.8	26.6		6.5	87.9	5.7		31.2	41.8	24.9	2.1	
Total%	1.6	37.4	0.6		1	4.2	1.9		3	41	2.6		2.1	2.8	1.7	0.1	

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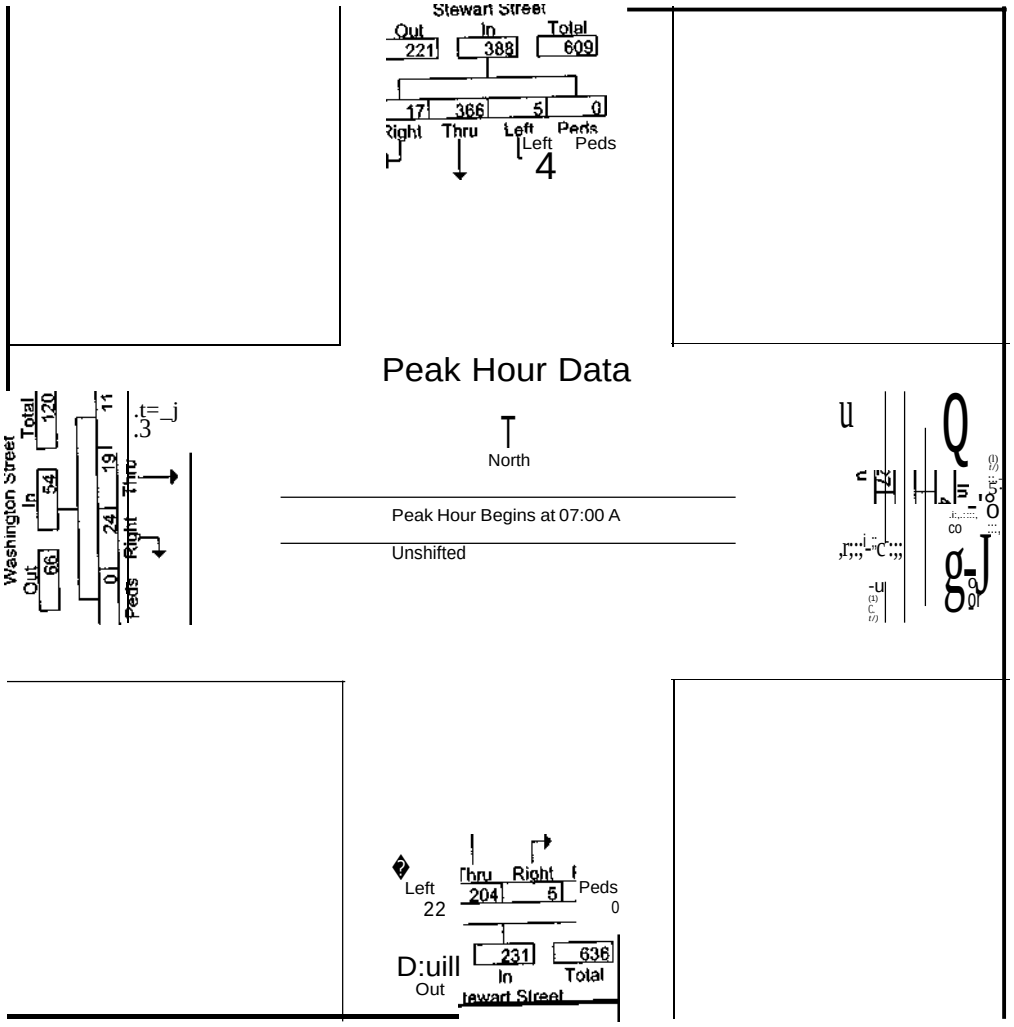
File Name : Washington-Stewart
Site Code : 00000000
Start Date : 11/18/2021
Page No :2

	Stewart Street From North					Washington Street From East					Stewart Street From South					Washington Street From West					
Start Time	Ri ht	Thru	Left	Peds	Tomi	Ri ht	Thru	Left	Peds	.rom,	Ri ht	Thru	Left	Peds	. Tomi	Ri ht	Thru	Left	Peds	.Tomi	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	4	78	1	0	83	**2**	4	4	0	10	1	49	0	0	50	6	5	3	0	14	157
07:15 AM	**8**	86	1	0	95	2	9	3	0	**14**	0	**54**	8	0	62	**11**	9	5	0	**25**	**196**
07:30 AM	3	**103**	**2**	0	**108**	0	5	6	0	11	1	53	**9**	0	**63**	3	3	2	0	8	190
07:45 AM	2	99	1	0	102	2	9	2	0	13	3	48	5	0	56	4	2	1	0	7	178
Total Volume	17	366	5	0	388	6	27	15	0	48	5	204	22	0	231	24	19	11	0	54	721
% ADD. Total	4.4	94.3	1.3	0		12.5	56.2	31.2	0		2.2	88.3	9.5	0		44.4	35.2	20.4	0		
PHF	.531	.888	.625	.000	.898	.750	.750	.625	.000	,857	.417	.944	,611	,000	.917	.545	.528	,550	.000	.540	.920



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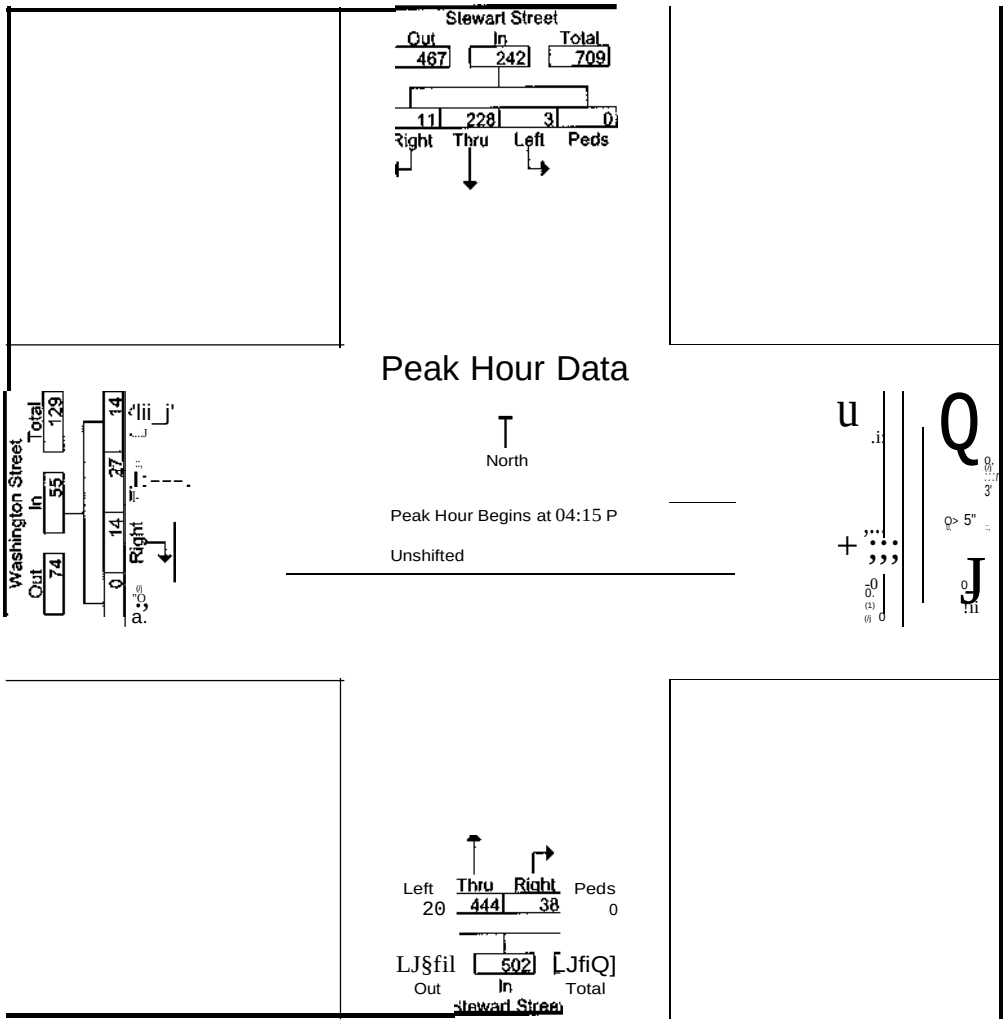
Las Vegas, NV 89044

File Name : Washington-Stewart
Site Code : 00000000
Start Date :11/18/2021
Page No :3

	Stewart Street From North					Washington Street From East					Stewart Street From South					Washington Street From West					
Start Time	Rioht	Thru	Left	Peds	Ano, Total	Rioht	Thru	Left	Peds	Aoo, Tow!	Rioht	Thru	Left	Peds	Ano, Tow!	Rioht	Thru	Left	Peds	Aoo, Towt	int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	3	60	0	0	63	2	**12**	5	0	19	**13**	101	2	0	116	3	**13**	5	0	**21**	219
04:30 PM	2	48	**2**	0	52	1	9	5	0	15	13	112	4	0	129	2	4	2	0	8	204
04:45 PM	**4**	44	1	0	49	**4**	12	4	0	**20**	5	115	1	0	121	3	8	5	0	16	206
05:00 PM	2	**76**	0	0	**78**	2	10	2	0	14	7	**116**	**13**	0	**136**	**6**	2	2	0	10	**238**
Total Volume	11	228	3	0	242	9	43	16	0	68	38	444	20	0	502	14	27	14	0	55	867
% Aoo, Total	4.5	94.2	1.2	0		13.2	63.2	23.5	0		7.6	88.4	4	0		25.5	49.1	25.5	0		
PHF	.688	,750	.375	.000	.776	,563	,896	.800	.000	,850	.731	.957	,385	.000	.923	.583	.519	.700	.000	.655	.911



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6345 S. Jones Boulevard, Suite 100
Las Vegas, NV 89044

File Name : **William-Stewart**
Site Code : **00000000**
Start Date : **11/17/2021**
Page No : **1**

Grouos Pnnted- Unsh!fted

	Stewart Street From North				William Street From East				Stewart Street From South				Williams Street From West				
Start Time	Riaht	Thru	Left	Peds	Riaht	Thru	Left	Peds	Riqht	Thru	Left	Peds	Riqht	Thru	Left!	Peds	Int. Total
07:00 AM	2	35	8	0	8	72	25	0	8	30	5	0	5	30	3	0	231
07:15 AM	2	38	9	0	4	79	26	0	10	29	7	0	8	38	3	0	253
07:30 AM	2	59	12	0	8	145	63	0	14	44	7	0	12	52	0	0	418
07:45 AM	5	48	11	0	7	116	56	0	13	27	15	0	18	57	2	0	375
Total	11	180	40	0	27	412	170	0	45	130	34	0	43	177	8	0	1277
08:00 AM	1	30	4	0	6	95	29	0	6	17	10	0	7	49	1	0	255
08:15 AM	2	34	4	0	0	140	30	0	11	26	16	0	4	52	2	0	321
08:30 AM	1	43	7	0	2	114	24	0	19	28	16	0	12	84	7	0	357
08:45 AM	1	31	6	0	6	103	19	0	9	17	3	0	3	62	8	0	268
Total	5	138	21	0	14	452	102	0	45	88	45	0	26	247	18	0	1201
*** BREAK ***																	
04:00 PM	5	45	9	0	5	88	16	0	24	55	23	0	5	96	3	0	374
04:15 PM	4	46	10	0	8	91	17	0	21	59	18	0	6	103	5	0	388
04:30 PM	21	25	15	1	5	124	31	0	23	53	37	0	6	110	7	0	458
04:45 PM	3	28	22	1	2	116	29	0	33	64	40	0	5	89	4	0	436
Total	33	144	56	2	20	419	93	0	101	231	118	0	22	398	19	0	1656
05:00 PM	7	36	31	0	9	93	26	0	55	117	40	0	7	162	5	0	588
05:15 PM	5	34	11	0	16	104	19	4	14	47	18	0	4	81	6	0	363
05:30 PM	2	23	7	0	5	111	16	0	11	50	21	0	5	85	0	0	336
05:45 PM	6	25	7	0	12	85	28	0	12	45	26	0	3	52	1	0	302
Total	20	118	56	0	42	393	89	4	92	259	105	0	19	380	12	0	1589
Grand Total	69	580	173		103	1676	454		283	708	302		110	1202	57		5723
Apprch %	8.4	70.4	21	0.!	4.6	74.9	20.3	0.	21.9	54.8	23.4		8	87.8	4.2		
Total%	1.2	10.1	3		1.8	29.3	7.9	0.1	4.9	12.4	5.3		1.9	21	1		

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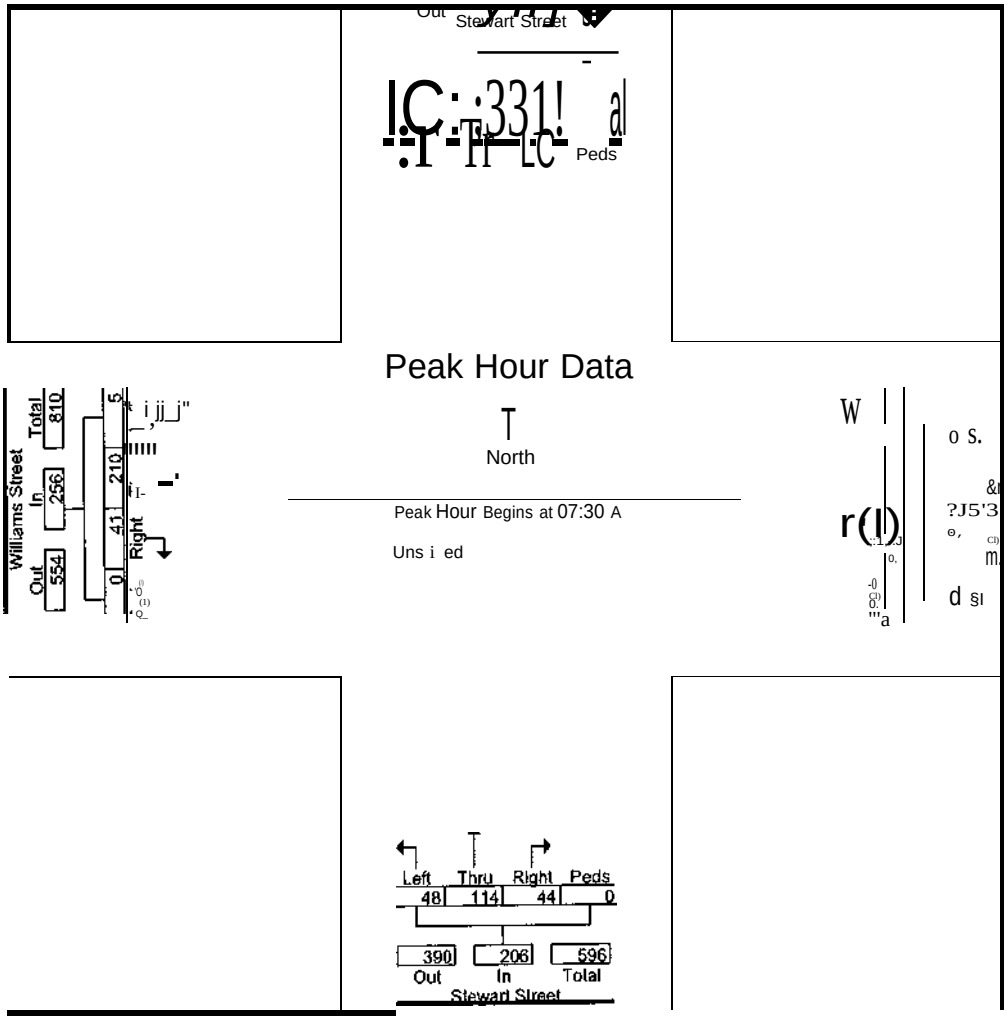
File Name : William-Stewart
Site Code : 00000000
Start Date : 11/17/2021
Page No :2

	Stewart Street From North					William Street From East					Stewart Street From South					Williams Street From West					
Start Time	Ri ht	Thru	Left	Peds	.Tola[	Ri ht	Thru	Left	Peds	. Tolar	Ri ht	Thru	Left	Peds	. Tola[	Ri ht	Thru	Left	Peds	.Tola[	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	2	**59**	**12**	0	**73**	**8**	**145**	**63**	0	**216**	**14**	**44**	7	0	**65**	12	52	0	0	64	**418**
07:45 AM	**5**	48	11	0	64	7	116	56	0	179	13	27	15	0	55	**18**	**57**	**2**	0	77	375
08:00 AM	1	30	4	0	35	6	95	29	0	130	6	17	10	0	33	7	49	1	0	57	255
08:15 AM	2	34	4	0	40	0	140	30	0	170	11	26	**16**	0	53	4	52	2	0	58	321
Total Volume	10	171	31	0	212	21	496	178	0	695	44	114	48	0	206	41	210	5	0	256	1369
% Aoo, Total	4.7	80.7	14.6	0		3	71.4	25.6	0		21.4	55.3	23.3	0		16	82	2	0		
PHF	,500	.725	.646	.000	.726	.656	.855	.706	.000	.804	.786	.648	.750	.000	.792	.569	.921	,625	.000	.831	.819



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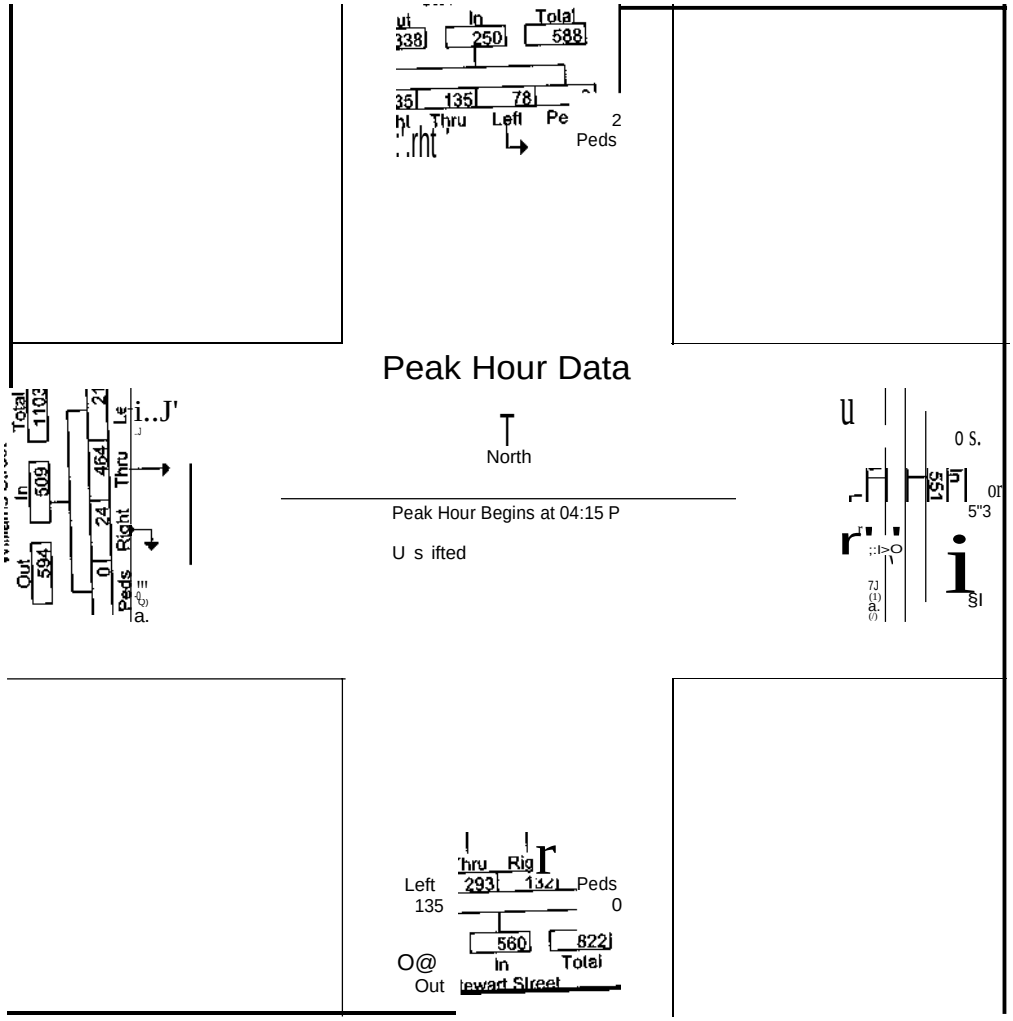
Las Vegas, NV 89044

File Name : William-Stewart
Site Code : 00000000
Start Date : 11/17/2021
Page No : 3

	Stewart Street From North					William Street From East					Stewart Street From South					Williams Street From West					
Start Time	Rioht	Thru	Left	Peds	Aoo. roi,,	Rioht	Thru	Left	Peds	App. rom,	Rioht	Thru	Left	Peds	Aon. Toi,1	Rioht	Thru	Left	Peds	Aon roi,1	Int. Tota\
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	4	**46**	10	0	60	8	91	17	0	116	21	59	18	0	98	6	103	5	0	114	388
04:30 PM	**21**	25	15	1	62	5	**124**	**31**	0	**160**	23	53	37	0	113	6	110	7	0	123	458
04:45 PM	3	28	22	1	54	2	116	29	0	147	33	64	**40**	0	137	5	89	4	0	98	436
05:00 PM	7	36	**31**	0	**74**	**9**	93	26	0	128	**55**	**117**	40	0	**212**	7	**162**	5	0	**174**	**588**
Total Volume	35	135	78	2	250	24	424	103	0	551	132	293	135	0	560	24	464	21	0	509	1870
% Aon. Total	14	54	31.2	0.8		4.4	77	18.7	0		23.6	52.3	24.1	0		4.7	91.2	4.1	0		
PHF	.417	.734	.629	.500	.845	.667	.855	.831	.000	.861	.600	.626	.844	.000	.660	,857	.716	.750	.000	.731	.795



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6345 S. Jones Boulevard, Suite 100
Las Vegas, NV 89044

File Name : Carson-William
Site Code : 00000000
Start Date : 11/18/2021
Page No : 1

Grouos P.nnted- Unsh'ıfted

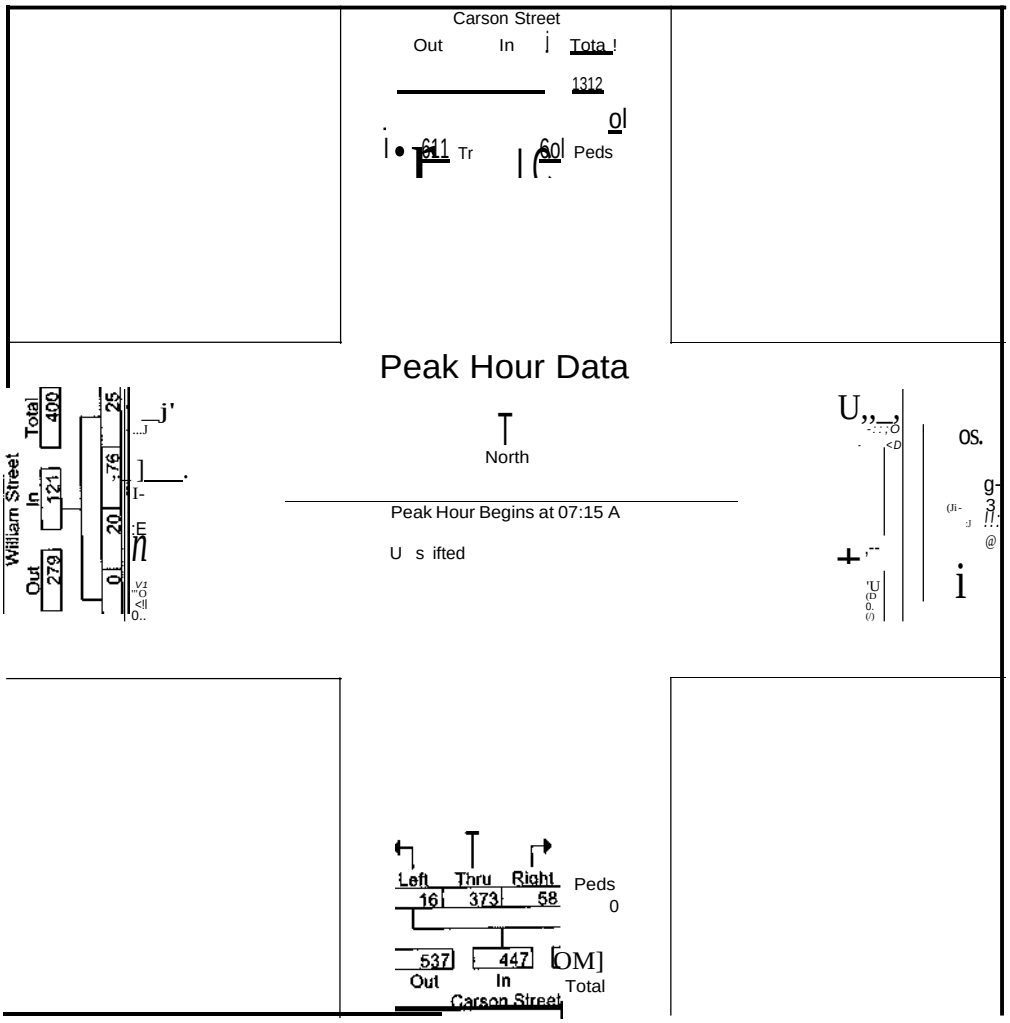
	Carson Street From North				William Street From East				Carson Street From South				William Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Letti	Peds	Right	Thru	Left	Peds	Right	Thru	Letti	Peds	Int. Total
07:00 AM	15	79	67	0	22	53	40	0	16	69	4	0	4	13	5	0	387
07:15 AM	12	84	79	0	29	69	41	0	13	80	3	0	6	16	7	0	439
07:30 AM	22	123	74	0	62	47	30	0	31	104	4	0	7	24	6	0	534
07:45 AM	14	87	51	0	67	39	20	0	8	109	6	0	4	16	7	0	428
Total	63	373	271	0	180	208	131	0	68	362	17	0	21	69	25	0	1788
08:00 AM	13	103	56	0	51	47	29	0	6	80	3	0	3	20	5	0	416
08:15 AM	13	98	44	0	48	37	33	0	15	72	5	0	4	16	5	0	390
08:30 AM	4	69	23	0	50	28	47	0	16	82	3	0	1	10	0	0	333
08:45 AM	5	81	34	0	37	23	26	0	9	68	4	0	0	12	4	0	303
Total	35	351	157	0	186	135	135	0	46	302	15	0	8	58	14	0	1442
*** BREAK ***																	
04:00 PM	5	100	51	0	58	18	29	0	19	111	2	0	3	21	7	0	424
04:15 PM	8	114	45	0	63	17	33	0	19	125	1	0	5	19	10	0	459
04:30 PM	11	123	64	0	87	21	29	0	23	130	4	0	6	23	7	0	528
04:45 PM	7	105	56	0	48	11	32	0	25	119	7	0	3	28	8	0	449
Total	31	442	216	0	256	67	123	0	86	485	14	0	17	91	32	0	1860
05:00 PM	9	96	55	0	45	28	34	0	28	138	1	0	2	28	18	0	482
05:15 PM	14	117	49	1	54	27	20	0	16	121	4	0	0	14	6	0	443
05:30 PM	6	96	32	0	64	16	22	0	11	93	5	0	2	6	5	0	358
05:45 PM	2	74	38	0	38	14	29	0	15	69	1	0	2	14	9	0	305
Total	31	383	174	1	201	85	105	0	70	421	11	0	6	62	38	0	1588
Grand Total	160	1549	818		823	495	494		270	1570	57		52	280	109		6678
Apprch %	6.3	61.3	32.4		45.4	27.3	27.3		14.2	82.8	3		11.8	63.5	24.7		
Total%	2.4	23.2	12.2		12.3	7.4	7.4		4	23.5	0.9		0.8	4.2	1.6		

Lochsa Engineering

6345 S. Jones Boulevard, Suite 100
Las Vegas, NV 89044

File Name : Carson-William
Site Code : 00000000
Start Date : 11/18/2021
Page No :2

	Carson Street From North					William Street From East					Carson Street From South					William Street From West					
Start Time	Ri ht	Thru	Left	Peds	A .r,1a1	Ri ht	Thru	Left	Peds		Ri ht	Thru	Left	Peds	ro1a1	Ri ht	Thru	Left	Peds	. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 **AM**	12	84	**79**	0	175	29	**69**	**41**	0	**139**	13	80	3	0	96	6	16	7	0	29	439
07:30 AM	**22**	**123**	74	0	**219**	62	47	30	0	139	**31**	104	4	0	**139**	7	**24**	6	0	**37**	**534**
07:45 AM	14	87	51	0	152	**67**	39	20	0	126	8	**109**	**6**	0	123	4	16	7	0	27	428
08:00 AM	13	103	56	0	172	51	47	29	0	127	6	80	3	0	89	3	20	5	0	28	416
Total Volume	61	397	260	0	718	209	202	120	0	531	58	373	16	0	447	20	76	25	0	121	1817
% Aoo. Total	8.5	55.3	36.2	0		39.4	38	22.6	0		13	83.4	3.6	0		16.5	62.8	20.7	0		
PHF	.693	.807	.823	.000	.820	.780	.732	.732	.000	.955	.468	.856	.667	.000	.804	.714	.792	.893	.000	.818	.851



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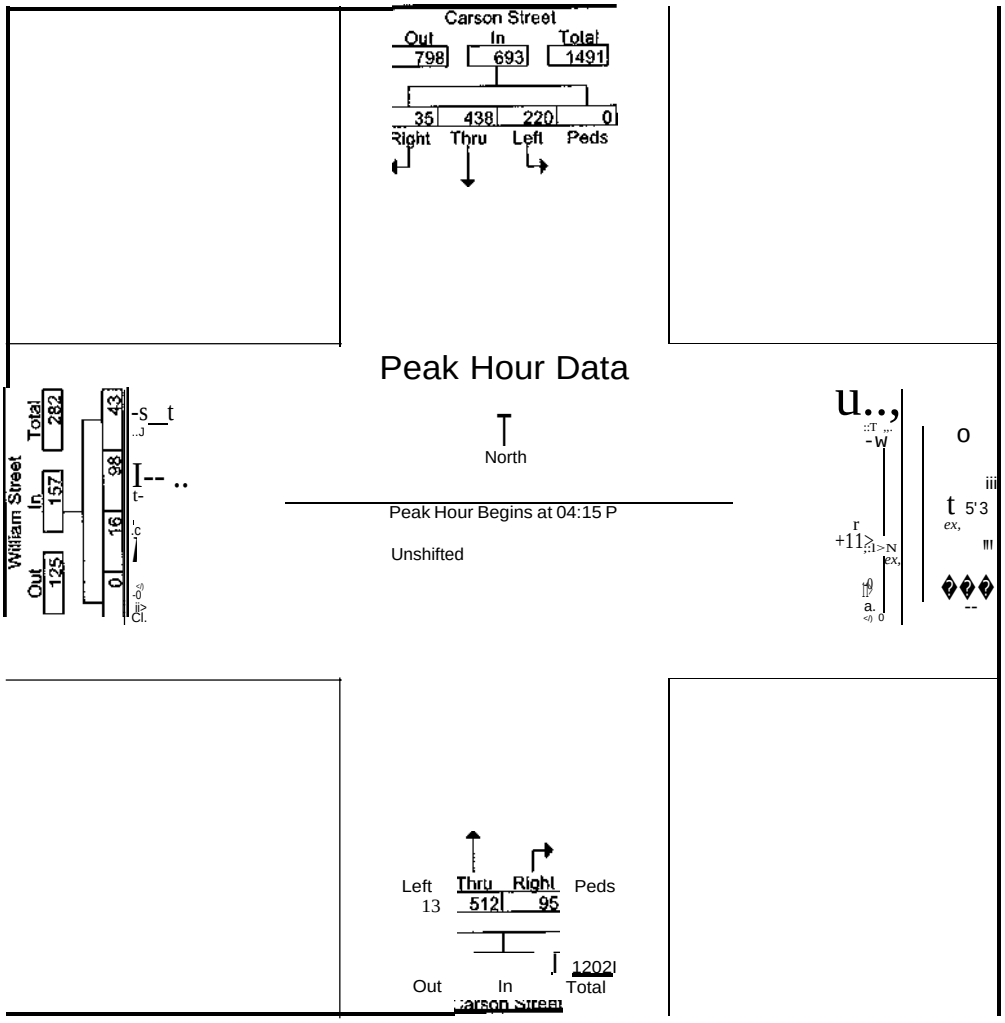
6345 S. Jones Boulevard, Suite 100
Las Vegas, NV 89044

File Name : Carson-William
Site Code : 00000000
Start Date : 11/18/2021
Page No :3

	Carson Street From North					William Street From East					Carson Street From South					William Street From West					
Start Time	Ri ht	Thru	Left	Peds	.r,1,1	RI hi	Thru	Left	Peds	.rolal	Ri ht	Thru	Left	Peds	.rolal	Ri ht	Thru	Left	Peds	. Total	Inl Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04·15 PM																					
04:15 PM	8	114	45	0	167	63	17	33	0	113	19	125	1	0	145	5	19	10	0	34	459
04:30 PM	**11**	**123**	**64**	0	**198**	**87**	21	29	0	**137**	23	130	4	0	157	**6**	23	7	0	36	**528**
04:45 PM	7	105	56	0	168	48	11	32	0	91	25	119	7	0	151	3	**28**	8	0	39	449
05:00 PM	9	96	55	0	160	45	**28**	**34**	0	107	**28**	**138**	1	0	**167**	2	28	**18**	0	**48**	482
Total Volume	35	438	220	0	693	243	77	128	0	448	95	512	13	0	620	16	98	43	0	157	1918
¾Aoo. Total	5.1	63.2	31.7	0		54.2	17.2	28.6	0		15.3	82.6	2.1	0		10.2	62.4	27.4	0		
PHF	.795	.890	.859	.000	.875	.698	.688	.941	.000	.818	.848	.928	.464	.000	.928	.667	.875	.597	.000	.818	.908



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6345 S. Jones Boulevard, Suite 100
Las Vegas, NV 89044

File Name : Roop-Williams
Site Code : 00000000
Start Date : 11/16/2021
Page No : 1

Grouos Pnnted- Unshifted

	Roop Street From North				Williams Street From East				Roop Street From South				Williams Street From West				
Start Time	Riaht	Thru	Letti	Peds	Right	Thru	Left	Peds	Riaht	Thru	Left!	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	8	46	27	0	19	118	44	0	9	66	6	0	5	77	5	0	430
07:15 AM	8	52	33	0	33	168	52	0	13	74	8	0	7	91	7	0	546
07:30 AM	13	46	35	0	30	220	46	0	14	80	12	0	6	92	4	0	598
07:45 AM	4	66	22	0	26	150	70	3	12	66	10	0	3	69	11	0	512
Total	33	210	117	0	108	656	212	3	48	286	36	0	21	329	27	0	2086
08:00 AM	5	65	21	0	12	104	26	0	14	36	3	0	3	77	6	0	372
08:15 AM	7	47	26	0	17	132	26	0	15	42	3	0	7	92	7	0	421
08:30 AM	7	52	34	0	21	107	33	2	15	50	6	0	7	68	12	0	414
08:45 AM	9	51	16	0	21	132	41	0	12	39	5	0	7	85	13	0	431
Total	28	215	97	0	71	475	126	2	56	167	17	0	24	322	38	0	1638
*** BREAK ***																	
04:00 PM	4	53	22	0	19	98	14	0	6	55	9	0	9	104	13	0	406
04:15 PM	3	61	20	0	26	115	26	0	4	62	6	0	7	119	16	0	465
04:30 PM	8	79	27	0	11	80	34	0	6	97	15	0	13	94	21	0	485
04:45 PM	10	112	63	0	10	149	29	0	15	91	19	0	9	144	23	0	674
Total	25	305	132	0	66	442	103	0	31	305	49	0	38	461	73	0	2030
05:00 PM	8	119	74	0	38	147	54	0	26	138	21	0	11	159	32	0	827
05:15 PM	4	104	35	0	15	190	26	0	21	100	14	0	10	193	18	0	730
05:30 PM	9	70	38	0	11	89	23	0	13	87	5	0	16	86	17	0	464
05:45 PM	7	93	50	0	19	152	15	2	13	76	13	0	14	137	19	0	610
Total	28	386	197	0	83	578	118	2	73	401	53	0	51	575	86	0	2631
Grand Total	114	1116	543		328	2151	559		208	1159	155		134	1687	224		8385
Apprch %	6.4	62.9	30.6		10.8	70.6	18.4	o.	13.7	76.1	10.2		6.6	82.5	11		
Total%	1.4	13.3	6.5		3.9	25.7	6.7	0.1	2.5	13.8	1.8		1.6	20.1	2.7		

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6345 S. Jones Boulevard, Suite 100
Las Vegas, NV 89044

File Name : Roop-Williams
Site Code : 00000000
Start Date : 11/16/2021
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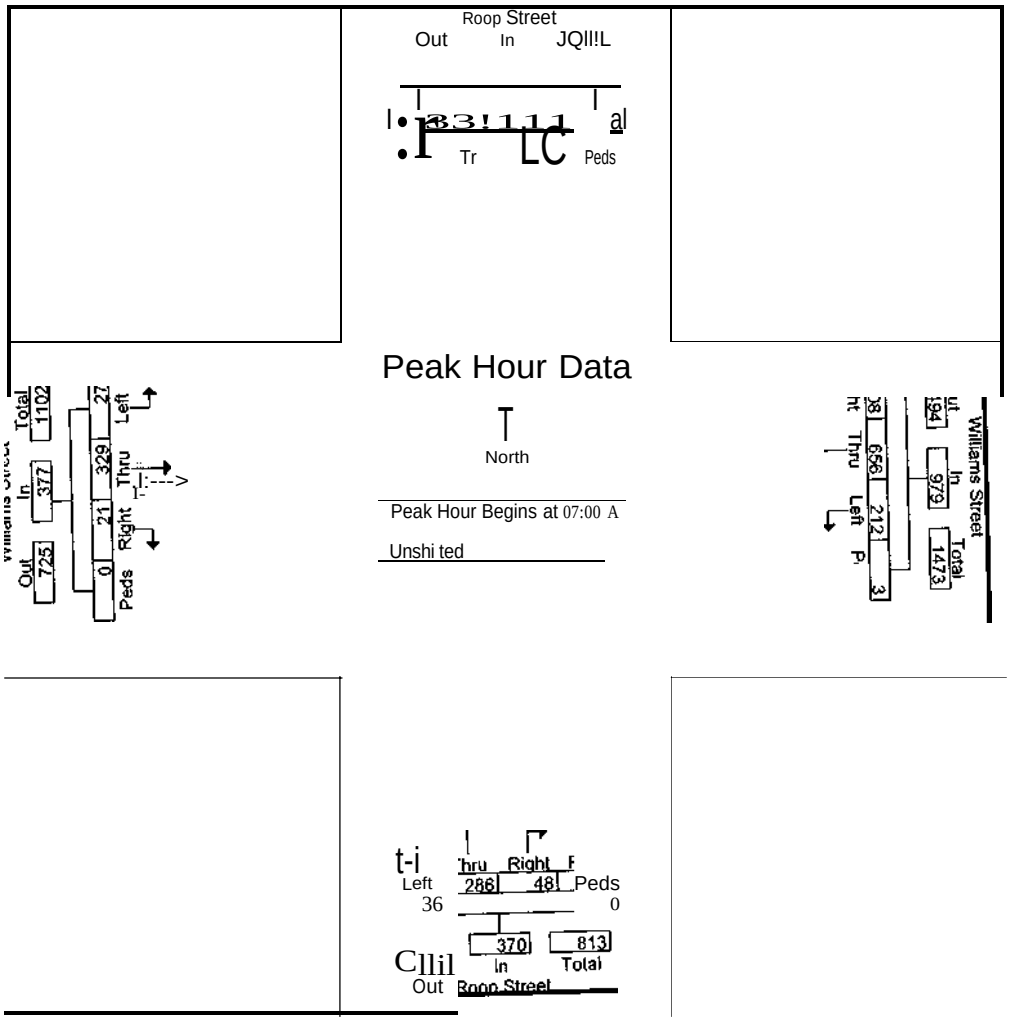
	Roop Street From North					Williams Street From East					Roop Street From South					Williams Street From West					
Start Time	Ri ht	Thru	Left	Peds	ro1,1	Ri ht	Thru	Left	Peds	.Tol0l	RI ht	Thru	Left	Peds	.ro ,	Ri ht	Thru	Left	Peds	Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07·00 AM																					
07:00 AM	8	46	27	0	81	19	118	44	0	181	9	66	6	0	81	5	77	5	0	87	430
07:15 AM	8	52	33	0	93	**33**	168	52	0	253	13	74	8	0	95	7	91	7	0	**105**	546
07:30 AM	**13**	46	**35**	0	**94**	30	**220**	46	0	**296**	**14**	**80**	**12**	0	**106**	6	**92**	4	0	102	**598**
07:45 AM	4	**66**	22	0	92	26	150	**70**	3	249	12	66	10	0	88	3	69	**11**	0	83	512
Total Volume	33	210	117	0	360	108	656	212	3	979	48	286	36	0	370	21	329	27	0	377	2086
% Ano. Total	9.2	58.3	32.5	0		11	67	21.7	0.3		13	77.3	9.7	0		5.6	87.3	7.2	0		
PHF	.635	.795	.836	.000	.957	.818	.745	.757	.250	.827	.857	.894	.750	.000	.873	.750	.894	.614	.000	.898	.872



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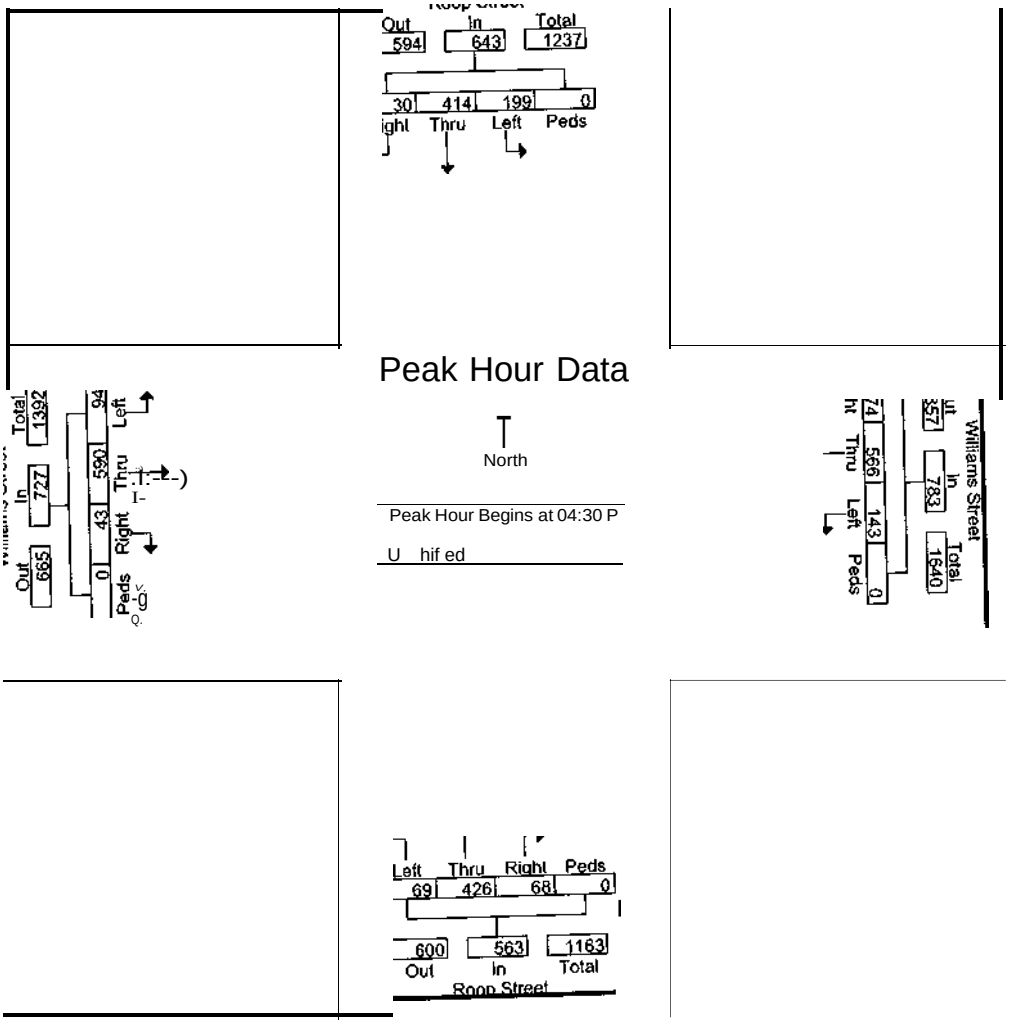
6345 S. Jones Boulevard, Suite 100
Las Vegas, NV 89044

File Name : Roop-Williams
Site Code : 00000000
Start Date : 11/16/2021
Page No :3

	Roop Street From North					Williams Street From East					Roop Street From South					Williams Street From West					
Start Time	Rioht	Thru	Left	Peds	Ano. Total	Riaht	Thru	Left	Peds	Ano. ro1a1	Riahl	Thru	Left	Peds	Aoo. Total	Riahl	Thru	Left	Pads	Aoo. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	8	79	27	0	114	11	80	34	0	125	6	97	15	0	118	**13**	94	21	0	128	485
04:45 PM	**10**	112	63	0	185	10	149	29	0	188	15	91	19	0	125	9	144	23	0	176	674
05:00 PM	8	**119**	**74**	0	**201**	**38**	147	**54**	0	**239**	**26**	**138**	**21**	0	**185**	11	159	**32**	0	202	**827**
05:15 PM	4	104	35	0	143	15	**190**	26	0	231	21	100	14	0	135	10	**193**	18	0	**221**	730
Total Volume	30	414	199	0	643	74	566	143	0	783	68	426	69	0	563	43	590	94	0	727	2716
%Ano. Total	4.7	64.4	30.9	0		9.5	72.3	18.3	0		12.1	75.7	12.3	0		5.9	81.2	12.9	0		
PHF	.750	.870	.672	.000	.800	.487	.745	.662	.000	.819	.654	.772	.821	.000	.761	.827	.764	.734	.000	.822	.821



APPENDIXC

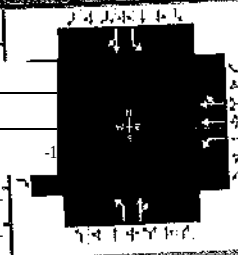
Intersection Analysis

HCS7 Signalized Intersection Results Summary

General Information

Agency	LOCHSA			Duration, h	0.250
Analyst	TT_E	Analysis Date	2_l_6l_2_02_1	Area Type	other
Jurisdiction	CARSON CITY	Time Period	AM	PHF	0.82
Urban Street	WILLIAMS STREET	Analysis Year	2021 EXISTING	Analysis Period	1> 7:00
Intersection	WILL	WILLIAMS STREET AT...	File Name	CASTAME.xus	
Project Description					

Intersection Information

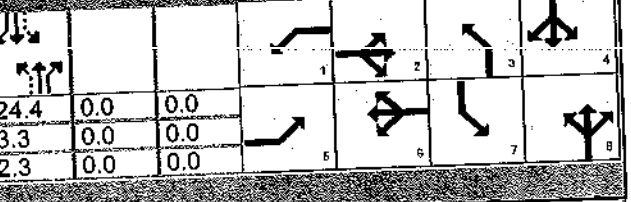


Demand Information

Approach Movement	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	5	210	41	178	496	21	48	114	44	31	171	10

Signal Information

Cycle, s	100.0	Reference Phase	2									
Offset, s	0	Reference Point	End	Green	14.2	22.7	14.8	24.4	0.0	0.0		
Uncoordinated	No	Simult. Gap E/W	On	Yellow	3.0	4.1	3.0	3.3	0.0	0.0		
Force Mode	Fixed	Simult. Gap N/S	On	Red	2.8	3.2	2.2	2.3	0.0	0.0		



Timer Results

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	4.0	1.1	4.0	1.1	4.0	1.1	4.0
Phase Duration, s	20.0	30.0	20.0	30.0	20.0	30.0	20.0	30.0
Change Period, (Y+R c), s	7.3	5.8				5.6	5.3	5.6
Max Allow Headway (MAH), s	3.3	0.0	3.3			3.2	3.3	3.2
Queue Clearance Time (gs), s	2.2		10.8		4.1	11.2	3.3	12.2
Green Extension Time (g e), s	0.0	0.0	0.1	0.0	0.0	0.7	0.0	0.7
Phase Call Probability	1.00		1.00		1.00	1.00	1.00	1.00
Max Out Probability	0.00							

Movement Group Results

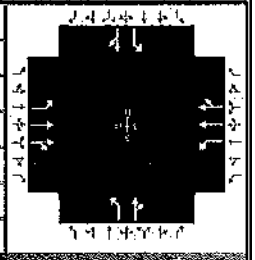
Movement	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement	5	2	12	1	6	16	3	8	18	7	4	14
Assigned Movement	6	164	142	217	317	313	59	193		38	221	
Adjusted Flow Rate (v), veh/h	1781	1870	1583	1781	1870	1843	1781	1781		1781	1852	
Adjusted Saturation Flow Rate (s), veh/h/ln	0.2	7.4	7.6	8.8	15.8	15.8	2.1	9.2		1.3	10.2	
Queue Service Time (gs), s	0.2	7.4	7.6	8.8	15.8	15.8	2.1	9.2		1.3	10.2	
Cycle Queue Clearance Time (g c), s	0.36	0.23	0.23	0.37	0.23	0.23	0.39	0.24		0.39	0.24	
Green Ratio (g/C)	353	425	359	487	425	418	477	435		515	452	
Capacity (c), veh/h	0.017	0.385	0.396	0.446	0.747	0.749	0.123	0.443		0.073	0.488	
Volume-to-Capacity Ratio (X)	2.5	93.4	81.6	102.9	216.6	211	23.6	110.7		15	128.7	
Back of Queue (Q), ft/ln (50 th percentile)	0.1	3.7	3.3	4.1	8.5	8.4	0.9	4.4		0.6	5.1	
Back of Queue (Q), veh/ln (50 th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	
Queue Storage Ratio (RQ) (50 th percentile)	22.0	32.7	32.8	23.0	36.0	36.0	19.9	32.0		19.4	32.4	
Uniform Delay (d_1), s/veh	0.1	2.6	3.3	2.9	11.4	11.6	0.5	3.3		0.3	3.7	
Incremental Delay (d 2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Initial Queue Delay (d 3), s/veh	22.0	35.4	36.1	26.0	47.4	47.6	20.4	35.3		19.7	36.2	
Control Delay (d), s/veh	C	D	D	C	D	D	C	D		B	D	
Level of Service (LOS)	35.4	D		42.0	D		31.8	C		33.8	C	
Approach Delay, s/veh / LOS	38.0						D					
Intersection Delay, s/veh / LOS												

Multimodal Results

	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.93	B	1.93	B	2.29	B	2.29	B
Bicycle LOS Score/ LOS	0.75	B	1.93	B	0.90	B	2.29	B
		A	1.19	A		A	0.91	A

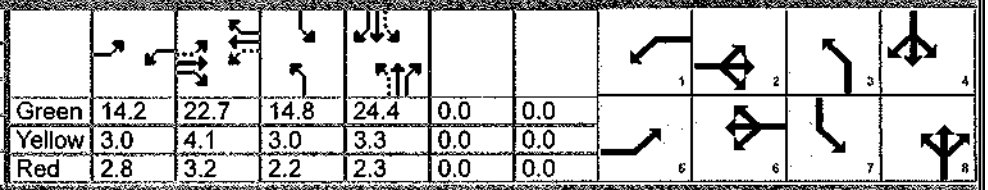
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	LOCHSA			Duration, h	0.250
Analyst	TTE	Analysis Date	12/6/2021	Area Type	Other
Jurisdiction	CARSON CITY	Time Period	PM	PHF	0.80
Urban Street	WILLIAMS STREET	Analysis Year	2021 EXISTING	Analysis Period	1> 7:00
Intersection	WILLIAMS STREET AT...	File Name	CASTPME.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	21	464	24	103	424	24	135	293	132	78	135	35

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



	EB			WB			NB			SB		
Green	14.2	22.7		14.8	24.4	0.0	0.0					
Yellow	3.0	4.1		3.0	3.3	0.0	0.0					
Red	2.8	3.2		2.2	2.3	0.0	0.0					

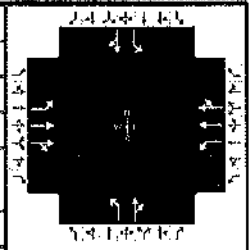
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	4.0	1.1	4.0	1.1	4.0	1.1	4.0
Phase Duration, s	20.0	30.0	20.0	30.0	20.0	30.0	20.0	30.0
Change Period, (Y+R c), s	6.4	7.3	5.8	7.3	5.2	5.6	5.3	5.6
Max Allow Headway (MAH), s	3.3	0.0	3.3	0.0		3.3	3.3	3.3
Queue Clearance Time (gs), s	3.0		6.9		8.4	26.4	5.5	11.9
Green Extension Time (g a), s	0.0	0.0	0.1	0.0		0.0	0.1	1.5
Phase Call Probability	1.00		1.00		1.00	1.00	1.00	1.00
Max Out Probability	0.00		0.01		0.04	1.00	0.00	0.02

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	26	324	286	129	282	278	169	531		98	213	
Adjusted Saturation Flow Rate (s), veh/h/ln	1781	1870	1652	1781	1870	1835	1781	1771		1781	1832	
Queue Service Time (gs), s	1.0	16.2	16.2	4.9	13.7	13.8	6.4	24.4		3.5	9.9	
Cycle Queue Clearance Time (g c), s	1.0	16.2	16.2	4.9	13.7	13.8	6.4	24.4		3.5	9.9	
Green Ratio (g/C)	0.36	0.23	0.23	0.37	0.23	0.23	0.39	0.24		0.39	0.24	
Capacity (c), veh/h	373	425	375	378	425	416	482	432		334	447	
Volume-to-Capacity Ratio (X)	0.070	0.762	0.764	0.341	0.665	0.667	0.350	1.229		0.292	0.475	
Back of Queue (Q), ft/ln (50 th percentile)	11.1	223.2	198.8	58.7	182.6	177.5	74.1	638.5		60.2	121.4	
Back of Queue (Q), veh/ln (50 th percentile)	0.4	8.8	8.0	2.3	7.2	7.1	2.9	25.1		2.4	4.9	
Queue Storage Ratio (RQ) (50 th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	
Uniform Delay (d 1), s/veh	21.9	36.1	36.1	23.0	35.2	35.2	21.2	37.8		22.6	32.3	
Incremental Delay (d 2), s/veh	0.4	12.2	13.7	2.4	8.0	8.2	2.0	122.0		2.2	3.6	
Initial Queue Delay (d 3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Control Delay (d), s/veh	22.2	48.3	49.9	25.5	43.2	43.4	23.3	159.8		24.8	35.9	
Level of Service (LOS)	C	D	D	C	D	D	C	F		C	D	
Approach Delay, s/veh / LOS	47.9	D		40.0	D		126.9	F		32.4	C	
Intersection Delay, s/veh / LOS	67.2						E					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.93	B	1.93	B	2.29	B	2.29	B
Bicycle LOS Score / LOS	1.01	A	1.06	A	1.64	B	1.00	A

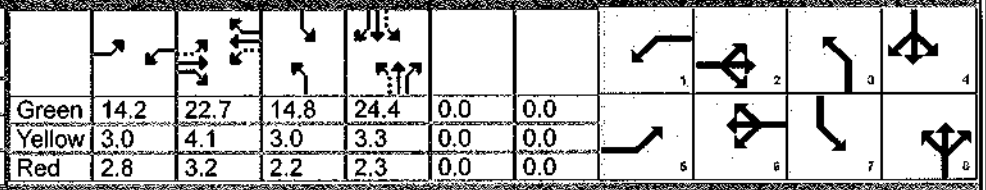
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	LOCHSA			Duration, h	0.250
Analyst	TTE	Analysis Date	12/6/2021	Area Type	Other
Jurisdiction	CARSON CITY	Time Period	AM	PHF	0.82
Urban Street	WILLIAMS STREET	Analysis Year	2022 BACKGROUND	Analysis Period	1> 7:00
Intersection	WILLIAMS STREET AT...	File Name	CASTAMB.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	5	211	41	179	499	21	48	115	44	31	172	10

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



	EB			WB			NB			SB		
Green	14.2	22.7		14.8	24.4	0.0	0.0					
Yellow	3.0	4.1		3.0	3.3	0.0	0.0					
Red	2.8	3.2		2.2	2.3	0.0	0.0					

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	4.0	1.1	4.0	1.1	4.0	1.1	4.0
Phase Duration, s	20.0	30.0	20.0	30.0	20.0	30.0	20.0	30.0
Change Period, (Y+R c), s	6.4	7.3	5.8	7.3	5.2	5.6	5.3	5.6
Max Allow Headway (MAH), s	3.3	0.0	3.3	0.0	3.3	3.2	3.3	3.2
Queue Clearance Time (gs), s	2.2		10.8		4.1	11.2	3.3	12.3
Green Extension Time (g e), s	0.0	0.0	0.1	0.0	0.0	0.7	0.0	0.7
Phase Call Probability	1.00		1.00		1.00	1.00	1.00	1.00
Max Out Probability	0.00		0.88		0.00	0.00		0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	6	164	143	218	319	315	59	194		38	222	
Adjusted Saturation Flow Rate (s), veh/h/ln	1781	1870	1584	1781	1870	1843	1781	1782		1781	1852	
Queue Service Time (gs), s	0.2	7.4	7.7	8.8	15.9	15.9	2.1	9.2		1.3	10.3	
Cycle Queue Clearance Time (g c), s	0.2	7.4	7.7	8.8	15.9	15.9	2.1	9.2		1.3	10.3	
Green Ratio (g/C)	0.36	0.23	0.23	0.37	0.23	0.23	0.39	0.24		0.39	0.24	
Capacity (c), veh/h	352	425	360	486	425	418	476	435		514	452	
Volume-to-Capacity Ratio (X)	0.017	0.387	0.398	0.449	0.752	0.753	0.123	0.446		0.074	0.491	
Back of Queue (Q), ft/ln (50 th percentile)	2.5	93.9	82.1	103.7	218.5	212.9	23.6	111.5		15	129.7	
Back of Queue (Q), veh/ln (50 th percentile)	0.1	3.7	3.3	4.1	8.6	8.5	0.9	4.4		0.6	5.1	
Queue Storage Ratio (RQ) (50 th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	
Uniform Delay (d 1), s/veh	22.0	32.8	32.8	23.1	36.0	36.0	19.9	32.1		19.4	32.5	
Incremental Delay (d 2), s/veh	0.1	2.6	3.3	3.0	11.6	11.8	0.5	3.3		0.3	3.8	
Initial Queue Delay (d 3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	
Control Delay (d), s/veh	22.1	35.4	36.1	26.0	47.6	47.9	20.4	35.4		19.7	36.2	
Level of Service (LOS)	C	D	D	C	D	D	C	D		B	D	
Approach Delay, s/veh / LOS	35.5	D		42.2	D		31.9	C		33.8	C	
Intersection Delay, s/veh / LOS	38.1						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.93	B	1.93	B	2.29	B	2.29	B
Bicycle LOS Score / LOS	0.75	A	1.19	A	0.90	A	0.92	A

HCS7 Signalized Intersection Results Summary

	LOCHSA			Duration, h	0.250
Analyst	TTE	Analysis Date	12/6/2021	Area Type	Other
Jurisdiction	CARSON CITY	Time Period	PM	PHF	0.80
Urban Street	WILLIAMS STREET	Analysis Year	2022 BACKGROUND	Analysis Period	1> 7:00
Intersection	WILLIAMS STREET AT...	File Name	CASTPMB.xus		

R

Signal Information		
Cycle, s	100.0	Reference Phase
Offset, s	O	Reference Point
Uncoordinated	No	Simult. Gap E/W
		Simult. Gap N/S

Assigned Phase		1			4
Case Number		1.1			4,0
Phase Duration, s					30.0
Change Period, (Y+R c), s		5.8			5,6
Max Allow Headway { MAH), s		3.3			3.3
Queue Clearance Time {gs), s		7.0			12.2
Green Extension Time { g e), s	0.0			0.1	1.5
Phase Call Probability				1.00	1.00

Queue Service Time s s
.5:)cle Queue Clearance Time { g c), s
Green Ratio { g/C)
Capacity (c), veh/h
Volume-to-Capacity Ratio { X
Back of Queue { Q), ft/ln { 50 th percentile)
Back of Queue { Q), veh/ln { 50 th percentile
Queue Storage Ratio { RO) (50 th percentile)
Uniform Delay { d 1), s/veh
Incremental Delay { d 2), s/veh
Initial Queue Delay { d 3), s/veh
Control Delay { d), s/veh
Level of Service (LOS)

Pedestrian LOS Score / LOS	B	B	2.29
Bicycle LOS Score / LOS	A	B	1.00

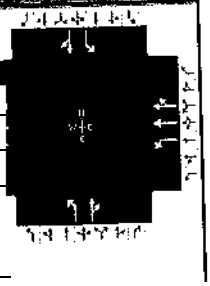
HCS7 Signalized Intersection Results Summary

General Information

Agency	LOCHSA			Duration, h	0.250
Analyst	TTE	Analysis Date	12/6/2021	Area Type	Other
Jurisdiction	CARSON CITY	Time Period	AM	PHF	0.82
Urban Street	WILLIAMS STREET	Analysis Year	2022 BACKGROUND WPROJ	Analysis Period	1> 7:00
Intersection	WILLIAMS STREET A...	File Name	CASTAMP.xus		
Project Description					

Intersection Information

ation, h 0.250

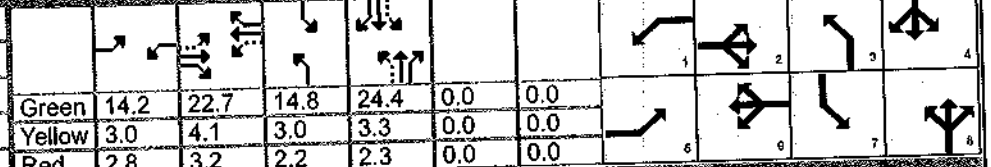


Demand Information

Approach Movement	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	5	211	43	189	499	21	55	118	74	31	173	10

Signal Information

Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Green	14.2	22.7	14.8	24.4	0.0	0.0		
Yellow	3.0	4.1	3.0	3.3	0.0	0.0		
Red	2.8	3.2	2.2	2.3	0.0	0.0		

Timer Results

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	4.0	1.1	4.0	1.1	4.0	1 7	4
Phase Duration, s			20.0	30.0	20.0	30.0	2 1.1	4.0
Change Period, ($Y+R_c$), s								30.0
Max Allow Headway (*MAH*), s								5.6
Queue Clearance Time (g_s), s							3.3	3.2
Green Extension Time (g_e), s	0.0	0.0	0.1	0.0	0.1	0.8	0.(3.3	12.4
Phase Call Probability	1.00		1.00		1.00	1.00	1.(0.0	0.8
Max Out Probability	0.00		1.00		0.00	0.01	0.(1.00	1.00

Movement Group Results

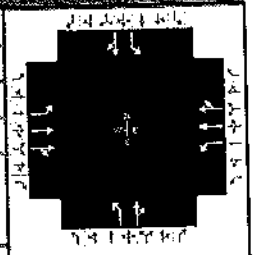
	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement											T	R
Assigned Movement											4	14
Adjusted Flow Rate (v), veh/h											223	
Adjusted Saturation Flow Rate (s), veh/h/ln	1781	1870	1580	1701								
Queue Service Time (gs), s	0.2	7.5	7.8	9.4	15.9	15.9	2.4	11.7		1.3	10.4	
Cycle Queue Clearance Time (g_c), s		7.5	7.8	9.4	15.9	15.9	2.4	11.7		1.3	10.4	
Green Ratio (g/C)		0.23	0.23	0.37	0.23	0.23	0.39	0.24		0.39	0.24	
Capacity (c), veh/h		425	359	485	425	418	475	427		480	452	
Volume-to-Capacity Ratio (X)	0.017	0.390	0.402	0.475	0.752	0.753	0.141	0.549		0.079	0.494	
Back of Queue (Q), ft/ln (50 th percentile)	2.5	94.8	82.7	110.9	218.5	212.9	27.3	141.1		15	130.4	
Back of Queue (Q), veh/ln										0.6	5.1	
Queue Storage Ratio (RQ) (50 th perce											5.1	
Uniform Delay (d_1), s/veh	22.0	32.8	32.9	23.3	36.0	36.0	20.0	33.0		19.7	32.5	
Incremental Delay (d_2), s/veh		2.7	3.3	3.3	11.6	11.8	0.6	5.0		0.3	3.8	
Initial Queue Delay (d_3), s/veh		0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Control Delay (d), s/veh		35.5	36.2	26.6	47.6	47.9	20.6	38.0		20.0	36.3	
Level of Service (LOS)		D						38.0			36.3	
Approach Delay, s/veh / LOS		D	D			C	D				D	
Intersection Delay, s/veh / LOS					34.1		C				C	

Multimodal Results

	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.93	B	1.93	B	2.29	B	2.29	
Bicycle LOS Score/ LOS	0.75	A	1.20	A	0.98	A	0.92	E

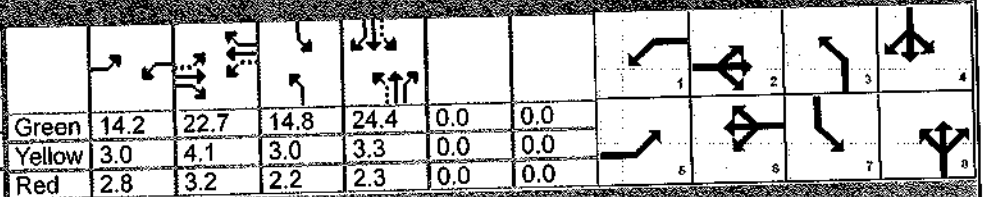
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	LOCHSA			Duration, h	0.250
Analyst	TTE	Analysis Date	12/6/2021	Area Type	Other
Jurisdiction	CARSON CITY	Time Period	PM	PHF	0.80
Urban Street	WILLIAMS STREET	Analysis Year	2022 BACKGROUND WPROJ	Analysis Period	1> 7:00
Intersection	WILLIAMS STREET AT...	File Name	CASTPMP.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	21	467	31	135	427	24	140	297	152	78	139	35

Signal Information				
Cycle, s	100.0	Reference Phase	2	
Offset, s	0	Reference Point	End	
Uncoordinated	No	Simult. Gap E/W	On	
Force Mode	Fixed	Simult. Gap N/S	On	



	Green	Yellow	Red
1	14.2	3.0	2.8
2	22.7	4.1	3.2
3	14.8	3.0	2.2
4	24.4	3.3	2.3
5	0.0	0.0	0.0
6	0.0	0.0	0.0
7			
8			

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	4.0	1.1	4.0	1.1	4.0	1.1	4.0
Phase Duration, s	20.0	30.0	20.0	30.0	20.0	30.0	20.0	30.0
Change Period, (Y+R c), s	6.4	7.3	5.8	7.3	5.2	5.6	5.3	5.6
Max Allow Headway (MAH), s	3.3	0.0	3.3	0.0	3.3	3.3	3.3	3.3
Queue Clearance Time (s), s	3.0		8.6		8.6	26.4	5.5	12.4
Green Extension Time (e), s	0.0	0.0	0.1	0.0	0.2	0.0	0.1	1.6
Phase Call Probability	1.00		1.00		1.00	1.00	1.00	1.00
Max Out Probability	0.00		0.09		0.05	1.00	0.00	0.03

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement			12	1	6			8	18	7	4	14
Adjusted Flow Rate (v), veh/h			292	169				561		98	218	
Adjusted Saturation Flow Rate (s), veh/h/ln			1644	1781				1763		1781	1805	
Queue Service Time (gs), s			16.7	6.6				24.4		3.5	10.4	
Cycle Queue Clearance Time (g c), s			16.7	6.6				24.4		3.5	10.4	
Green Ratio (g/C)										0.39	0.24	
Capacity (c), veh/h										334	440	
Volume-to-Capacity Ratio (X)										0.292	0.494	
Back of Queue (Q), ft/ln (50 th percentile)										60.2	127.4	
Back of Queue (Q), veh/ln (50 th percentile)	0.4	9.1	8.2	3.2	7.3	7.2	3.0	20.7		2.4	5.0	
Queue Storage Ratio (RQ) (50 th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	
Uniform Delay (d 1), s/veh	21.9	36.3	36.3	23.8	35.2	35.2	21.4	37.8		22.6	32.5	
Incremental Delay (d 2), s/veh	0.4	13.2	15.0	3.9	8.1	8.4	2.2	153.2		2.2	3.9	
Initial Queue Delay (d 3), s/veh								0.0		0.0	0.0	
Control Delay (d), s/veh								191.0		24.8	36.4	
Level of Service (LOS)								F		C	D	
Approach Delay, s/veh / LOS									F	32.8		C
Intersection Delay, s/veh / LOS			75.1							E		

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.93	B	1.93	B	2.29	B	2.29	B
Bicycle LOS Score / LOS	1.02	A	1.09	A	1.70	B	1.01	A

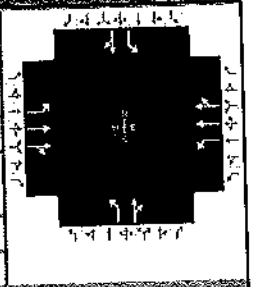
HCS7 Signalized Intersection Results Summary

General Information

Agency	LOCHSA			Duration, h	0.250
Analyst	TTE	Analysis Date	12/6/2021	Area Type	Other
Jurisdiction	CARSON CITY	Time Period	AM	PHF	0.82
Urban Street	WILLIAMS STREET	Analysis Year	2050 BACKGROUND	Analysis Period	1> 7:00
Intersection	WILLIAMS STREET AT...	File Name	CASTAM50B.xus		

Project Description

Intersection Information

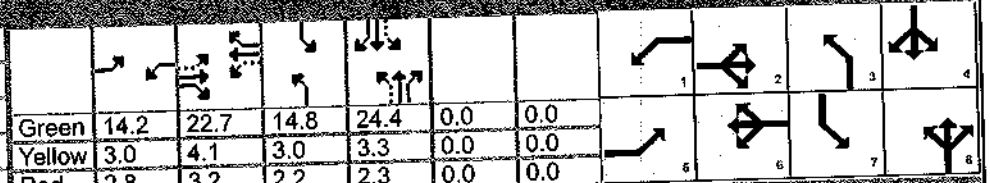


Demand Information

	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	6	251	49	213	593	25	57	141	53	37	204	12

Signal Information

Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	14.2	22.7	14.8	24.4	0.0	0.0	
Yellow	3.0	4.1	3.0	3.3	0.0	0.0	
Red	2.8	3.2	2.2	2.3	0.0	0.0	

Timer Results

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	4.0	1.1	4.0	1.1	4.0	1.1	4.0
Phase Duration, s	20.0	30.0	20.0	30.0	20.0	30.0	20.0	30.0
ge Period, (Y+R C), s	6.4	7.3	5.8	7.3	5.2	5.6	5.3	5.6
Max Allow Headway (MAH), s	3.3	0.0	3.3	0.0	3.3	3.2	3.3	3.2
Queue Clearance Time (gs), s	2.3		12.8		4.5	13.6	3.6	14.5
Green Extension Time (g e), s	0.0	0.0	0.1	0.0	0.1	0.8	0.0	0.8
Phase Call Probability	1.00		1.00		1.00	1.00	1.00	1.00
Max Out Probability	0.00		1.00		0.00	0.01	0.00	0.02

Movement Group Results

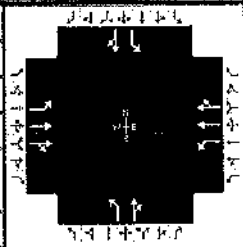
	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	7	196	170	260	379	374	70	237		45	263	
Adjusted Saturation Flow Rate (s), veh/h/ln	1781	1870	1583	1781	1870	1843	1781	1783		1781	1852	
Queue Service Time gs), s	0.3	9.0	9.3	10.8	19.7	19.7	2.5	11.6		1.6	12.5	
Cycle Queue Clearance Time (g C), s	0.3	9.0	9.3	10.8	19.7	19.7	2.5	11.6		1.6	12.5	
Green Ratio (g/C)	0.36	0.23	0.23	0.37	0.23	0.23	0.39	0.24		0.39	0.24	
Capacity (c), veh/h	321	425	359	461	425	418	446	435		481	452	
Volume-to-Capacity Ratio (X)	0.023	0.462	0.473	0.563	0.894	0.894	0.156	0.544		0.094	0.583	
Back of Queue (Q), ft/ln (50 th percentile)	3.1	115.3	100.4	130.2	298.6	290.8	28.4	142		18	160.4	
Back of Queue (Q), veh/ln (50 th percentile)	0.1	4.5	4.0	5.1	11.8	11.6	1.1	5.6		0.7	6.3	
Queue Storage Ratio (RQ) (50 th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.7	6.3	
Uniform Delay (d 1), s/veh	22.7	33.4	33.5	23.9	37.5	37.5	20.4	32.9		10.00	0.00	
Incremental Delay (d 2), s/veh	0.1	3.6	4.4	4.9	23.8	24.1	0.7	4.8		19.7	33.3	
Initial Queue Delay (d 3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.4	5.4	
Control Delay (d), s/veh	22.9	37.0	37.9	28.8	61.3	61.6	21.1	37.8		20.1	38.7	
Level of Service (LOS)	C	D	D	C	E	E	C	D		C	D	
Approach Delay, s/veh / LOS	37.1	D		53.1	D		34.0	C		36.0	D	
Intersection Delay, s/veh / LOS	44.5						D					

Multimodal Results

	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.93	B	1.93	B	2.29	B	2.29	
Bicycle LOS Score/ LOS	0.80	A	1.32	A	0.99	A	1.00	

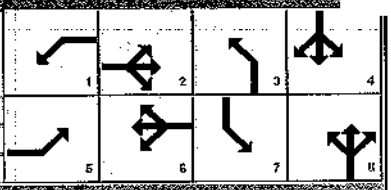
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	LOCHSA			Duration, h	0.250
Analyst	TTE	Analysis Date	12/6/2021	Area Type	Other
Jurisdiction	CARSON CITY	Time Period	PM	PHF	0.80
Urban Street	WILLIAMS STREET	Analysis Year	2050 BACKGROUND	Analysis Period	1> 7:00
Intersection	WILLIAMS STREET AT...	File Name	CASTPM50B.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	25	555	29	123	508	29	161	350	158	93	161	42

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	14.2	22.7		14.8	24.4	0.0	0.0					
Yellow	3.0	4.1		3.0	3.3	0.0	0.0					
Red	2.8	3.2		2.2	2.3	0.0	0.0					

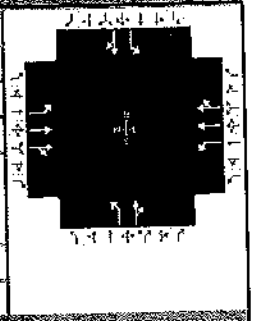
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number								4.0
Phase Duration, s								30.0
Change Period, ($Y+R_c$), s								5.6
Max Allow Headway (*MAH*), s								3.3
Queue Clearance Time (g_s), s								14.4
Green Extension Time (g_e), s		0.0						1.7
Phase Call Probability								1.00
	0.00		0.04		0.18	1.00	0.00	0.10

Movement Group Results	EB			WB			NB		SB		
Approach Movement								R	L	T	R
Assigned Movement							8	18	7	4	14
Adjusted Flow Rate (*v*), veh/h							635		116	254	
Adjusted Saturation Flow Rate (*s*), veh/h/ln							1771			1803	
Queue Service Time (	1.1	20.2	20.2	6.0	17.1	17.1	24.4			12.4	
Cycle Queue Clearance Time (g_c), s							24.4			12.4	
Green Ratio (*g/C*)							0.24			0.24	
Capacity (*c*), veh/h										440	
Volume-to-Capacit Ratio (X)	0.091	0.913	0.914	0.448	0.797	0.799	0.449	1.469	0.348	0.577	
Back of Queue (Q), ft/ln (50 th percentile)	13.4	312.4	278.8	73.4	240.5	233.5	92.1	948	73.1	154.5	
Back of Queue (Q), veh/ln (50 th percentile)										6.1	
Storage Ratio (*RQ*) (50 th percentile)										0.00	
Uniform Delay (d_1), s/veh										33.3	
Incremental Delay (d_2), s/veh								223.5		5.4	
Initial Queue Delay (d_3), s/veh								0.0		0.0	
Control Delay (*d*), s/veh								261.3		38.7	
Level of Service (LOS)	C	E	E	C	D	D	C	F	C	D	
Approach Delay, s/veh / LOS											C
Intersection Delay, s/veh / LOS											F

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.93	B	1.93	B	2.29	B	2.29	B
Bicycle LOS Score / LOS	1.12	A	1.17	A	1.87	B	1.10	A

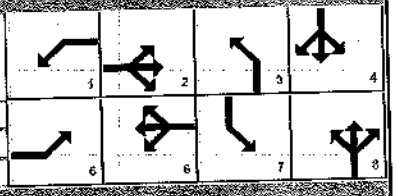
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	LOCHSA			Duration, h	0.250
Analyst	TTE	Analysis Date	12/6/2021	Area Type	Other
Jurisdiction	CARSON CITY	Time Period	AM	PHF	0.82
Urban Street	WILLIAMS STREET	Analysis Year	2050 BACKGROUND WPROJ	Analysis Period	1> 7:00
Intersection	WI	WILLIAMS STREET AT...	File Name	CAST	ASTAM50P.xus
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	6	251	51	223	593	25	64	144	83	37	205	12

Signal Information				EB			WB			NB			SB		
Cycle, s	100.0	Reference Phase	2												
Offset, s	0	Reference Point	End	Green	14.2	22.7	14.8	24.4	0.0	0.0					
Uncoordinated	No	Simult. Gap E/W	On	Yellow	3.0	4.1	3.0	3.3	0.0	0.0					
Force Mode	Fixed	Simult. Gap N/S	On	Red	2.8	3.2	2.2	2.3	0.0	0.0					



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	4.0	1.1	4.0	1.1	4.0	1.1	4.0
Phase Duration, s	20.0	30.0	20.0	30.0	20.0	30.0	20.0	30.0
Change Period, (Y+R c), s	6.4	7.3	5.8	7.3	5.2	5.6	5.3	5.6
Max Allow Headway (MAH), s	3.3	0.0	3.3	0.0	3.3	3.2	3.3	3 5.6
Queue Clearance Time g s	2.3		13.4		4.8	16.2	3.6	14 3.2
Green Extension Time (g e), s	0.0	0.0	0.1	0.0	0.1	0.8	0.0	0 14.6
Phase Call Probability	1.00		1.00		1.00	1.00	1.00	1. 0.9
Max Out Probability	0.00		1.00		0.00	0.07	0.00	0. 1.00
								0.03

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	7	197	171	272	379	374	78	277		45	265	
Adjusted Saturation Flow Rate (s), veh/h/ln	1781	1870	1580	1781	1870	1843	1781	1755		1781	1852	
Queue Service Time (gs), s	0.3	9.1	9.4	11.4	19.7	19.7	2.8	14.2		1.6	12.6	
Cycle Queue Clearance Time (g c), s	0.3	9.1	9.4	11.4	19.7	19.7	2.8	14.2		1.6	12.6	
Green Ratio (g/C	0.36	0.23	0.23	0.37	0.23	0.23	0.39	0.24		0.39	0.24	
Capacity (c), veh/h	321	425	359	460	425	418	445	428		447	452	
Volume-to-Capacity Ratio (X)	0.023	0.465	0.476	0.591	0.894	0.894	0.175	0.647		0.101	0.586	
Back of Queue (Q), ft/ln (50 th percentile)	3.1	116.2	101.2	138.5	298.6	290.8	32.2	175.3		18.1	161.4	
Back of Queue (Q), veh/ln (50 th percentile)	0.1	4.6	4.0	5.5	11.8	11.6	1.3	6.9		0.7	161.4*	
Queue Storage Ratio (RQ) (50 th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	6.4	
Uniform Delay (d 1), s/veh	22.7	33.4	33.5	24.1	37.5	37.5	20.5	33.9		20.1	0.00	
Incremental Delay (d 2), s/veh	0.1	3.6	4.5	5.5	23.8	24.1	0.9	7.3		0.5	5.5	
Initial Queue Delay (d 3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Control Delay (d), s/veh	22.9	37.0	38.0	29.6	61.3	61.6	21.3	41.3		20.5	38.8	
Level of Service (LOS)	C	D	D	C	E	E	C	D		C	D	
Approach Delay, s/veh / LOS	37.2	D		53.0	D		36.9	D		36.1	D	
Intersection Delay, s/veh / LOS	44.8						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.93	B	1.93	B	2.29	B	2.29	B
Bicycle LOS Score / LOS	0.80	A	1.33	A	1.07	A	1.00	A

HCS7 Signalized Intersection Results Summary

				Intersection Information	
	LOCHSA			Duration, h	0.250
Analyst	TIE	Analysis Date	12/6/2021	Area	Other
Jurisdiction	CARSON CITY	Time Period	PM	PHF	0.80
Urban Street	WILLIAMS STREET	Analysis Year	2050 BACKGROUND WPROJ	Analysis Period	1> 7:00
	WILLIAMS STREET AT...	File Name	CASTPM50P.xus		

Signal Information		
Cycle, s	100.0	Reference Phase
Offset, s	O	Reference Point
Uncoordinated	No	Simult. Gap E/W
		Simult. Gap N/S

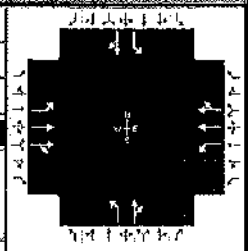
Assigned Phase			4
Case Number			4.0
Phase Duration, s			30.0
Change Period, (Y+R c), s			5.6
Max Allow Headway (MAH), 2		3.3	3.3
Queue Clearance Time		6.3	14.6
Green Extension Time		0.1	1.8
Phase Call Probability		1.00	1.00
Max Out Probability		0.00	0.12

			SB T	R
d Movement				
Adjusted Flow Rate (v), veh/h				
Adjusted Saturation Flow Rate (s), veh/h/ln				
Queue Service Time (gs), s				
Cycle Queue Clearance Time (g c), s				
Green Ratio (g/C)				
Capacity (c), veh/h				
Volume-to-Capacity Ratio (X)				
Back of Queue (Q), ft/ln (50 th percentile)				
Back of Queue (Q), veh/ln (50 th percentile)				
-9 Storage Ratio (RQ) (50 th percentile)				
Uniform Delay (d 1), s/veh		36.5		
Incremental Delay (d 2), s/veh		14.4		
Initial Queue Delay (d 3), s/veh		0.0	0.0	
Control Delay (d), s/veh		50.9	38.9	
Level of Service (LOS)		D	D	
Approach Delay, s/veh / LOS	46.7	D		C

edestrian LOS Score/ LOS	1.93	B	
Bicycle LOS Score / LOS	1.20	A	A

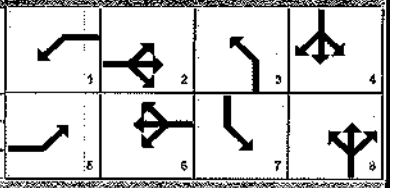
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	LOCHSA			Duration, h	0.250
Analyst	TTE	Analysis Date	12/6/2021	Area Type	Other
Jurisdiction	CARSON CITY	Time Period	PM	PHF	0.80
Urban Street	WILLIAMS STREET	Analysis Year	2022 BACKGROUND WPROJ	Analysis Period	1> 7:00
Intersection	WILLIAMS STREET AT...	File Name	WISTPMPMOD.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	21	467	31	135	427	24	140	297	152	78	139	35

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



	EB			WB			NB			SB		
Green	3.1	4.8		28.6	5.6	3.0	30.2					
Yellow	3.2	0.0		4.1	3.0	0.0	3.3					
Red	3.2	0.0		3.2	2.3	0.0	2.3					

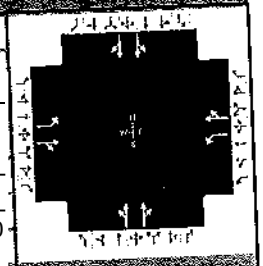
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Jsigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	4.0	1.1	4.0	1.1	4.0	1.1	4.0
Phase Duration, s	9.5	35.9	14.3	40.7	14.0	38.9		35.8
Change Period, (Y+R c), s	6.4	7.3	5.8	7.3	5.2	5.6	5.3	5.6
Max Allow Headway (MAH), s	3.3	0.0	3.3	0.0	3.3	3.3	3.3	3.3
eue Clearance Time (gs), s	3.0		8.5		8.6	33.2	5.7	11.6
Green Extension Time (g e), s	0.0	0.0	0.2	0.0	0.2	0.1	0.1	1.7
Phase Call Probability	0.52		0.99		0.99	1.00	0.93	1.00
Max Out Probability	0.00		0.06		0.05	1.00	0.00	0.00

Movement Group Results	EB			WB			NB			SB		
pproach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	26	331	292	169	284	280	175	561		98	218	
Adjusted Saturation Flow Rate (s), veh/h/ln	1781	1870	1644	1781	1870	1835	1781	1763		1781	1805	
Queue Service Time (gs), s	1.0	15.3	15.4	6.5	11.9	12.0	6.6	31.2		3.7	9.6	
Queue Clearance Time g c), s	1.0	15.3	15.4	6.5	11.9	12.0	6.6	31.2		3.7	9.6	
-§ en Ratio (g/C)	0.32	0.29	0.29	0.38	0.33	0.33	0.39	0.33		0.36	0.30	
Capacity (c), veh/h	292	535	470	330	625	613	468	586		172	545	
Volume-to-Capacity Ratio (X)	0.090	0.619	0.621	0.511	0.454	0.456	0.374	0.957		0.565	0.399	
Back of Queue (Q), ft/ln (50 th percentile)	11.1	195.5	172.1	69.5	145.2	140.9	70.7	441.1		40.9	105.6	
Back of Queue (Q), veh/ln (50 th percent, le)	0.4	7.7	6.9	2.7	5.7	5.6	2.8	17.4		1.6	4.2	
Queue Storage Ratio (RQ) J 5 . h percen tile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	
. niform Delay (d 1), s/veh	24.1	31.0	31.0	22.8	26.1	26.1	21.2	32.7		26.4	27.7	
Incremental Delay (d 2), s/veh	0.0	5.3	6.0	0.5	2.4	2.4	0.2	26.3		1.1	0.2	
.!!)itial Queue Delay (d 3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Control Delay (d), s/veh	24.2	36.3	37.0	23.3	28.5	28.6	21.4	59.0		27.4	27.9	
Level of Service (LOS)	C	D	D	C	C	C	C	E		C	C	
Approach Delay, s/veh / LOS	36.1	D		27.3	C		50.0	D		27.7	C	
Intersection Delay, s/veh / LOS	36.6						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score/ LOS	1.93	B	1.92	B	2.28	B	2.29	B
Bicycle LOS Score / LOS	1.02	A	1.09	A	1.70	B	1.01	A

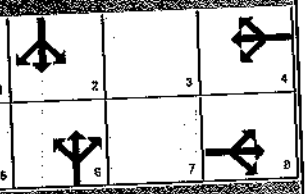
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
gen_cv	LOCHSA			Duration, h	0.250
Analyst	TTE	Analysis Date	12/6/2021	Area T¥_Pe	Other
' Jurisdiction	CARSON CITY	Time Period	AM EXIST	PHF	0.92
Urban Street	STEWART STREET	Analysis Year	2021	Analysis Period	1> 7:00
section STEV	STEWART ST AT WAS...	File Name	WASTAME.xus		
ect Description					



and Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
roach Movement ovement	11	19	24	15	27	6	22	204	5	5	366	17
and (v), veh), veh/h												

Signal Information													
Cycle, s	65.0	erence Phase	2										
Offset, s	0	erence Point	End	Green	33.7	19.4	0.0	0.0	0.0	0.0			
coordinated	No	Simult. Gap E/W	On	Yellow	4.1	3.4	0.0	0.0	0.0	0.0			
ce Mode	Fixed	Simult. Gap N/S	On	Red	2.2	2.2	0.0	0.0	0.0	0.0			



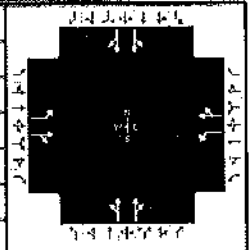
ner Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		8		4		6		2
Case Number		6.0		6.0		8.0		8.0
Phase Duration, s		25.0		25.0		40.0		40.0
Change Period, (Y+R c), s		5.6		5.6		6.3	40.0	40.0
Max Allow Headway (MAH), s		3.3		3.3		0.0	6.3	6.3
Queue Clearance Time (gs), s		3.4		4.0		0.0	0.0	0.0
Green Extension Time (g e), s		0.2		0.2		0.0		
Phase Call Probability		1.00		1.00			0.0	0.0
ax Out Probability		0.00		0.00				

ovement Group Results	EB			WB			NB					
pproach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow Rate (v), veh/h	12	47		16	36		129		122	222		200
Adjusted Saturation Flow Rate (s), veh/h/ln	1372	1530		1359	1811		1665		1688	1864		1674
Queue Service Time (gs), s	0.4	1.4		0.6	0.9		0.0		2.4	0.0		4.2
Cycle Queue Clearance Time (g c), s	1.3	1.4		2.0	0.9		2.3		2.4	4.2		4.2
Green Ratio (g/C)	0.30	0.30		0.30	0.30		0.52		0.52	0.52		0.52
Capaci! t (c), veh/h	501	457		486	541		929		875	1023		868
Volume-to-Capacity Ratio (X)	0.024	0.102		0.034	0.066		0.139		0.139	0.217		0.230
Back of Queue (Q), ft/ln (50 th percentile)	3.5	13.7		4.8	10.2		23		21.9	41.5		38
Back of Queue (Q), veh/ln (50 th percentile)	0.1	0.5		0.2	0.4		0.9		0.9	1.7		1.5
Queue Storage Ratio (RQ) (50 th percentile)	0.00	0.00		0.00	0.00		0.00		0.00	0.00		0.00
Uniform Delay (d 1), s/veh	16.8	16.5		17.2	16.3		8.1		8.1	8.6		8.6
Incremental Delay (d 2), s/veh	0.1	0.4		0.1	0.2		0.3		0.3	0.5		0.6
Initial Queue Delay (d 3), s/veh	0.0	0.0		0.0	0.0		0.0		0.0	0.0		0.0
Control Delay (d), s/veh	16.9	16.9		17.4	16.6		8.4		8.5	9.0		9.2
level of Service (LOS)	B	B		B	B		A		A	A		A
Approach Delay, s/veh / LOS	16.9	B		16.8	B		8.4	A		9.1	A	
Intersection Delay, s/veh / LOS	10.0						A					

Multimodal Results	EB		WB		NB		SB	
	2.10	B	2.10	B	1.88	B	1.88	B
Pedestrian LOS Score/ LOS	0.58	B	2.10	B	1.88	B	0.84	A
Bicycle LOS Score / LOS		A	0.57	A	0.69	A	1.88	B
							0.84	A

HCS7 Signalized Intersection Results Summary

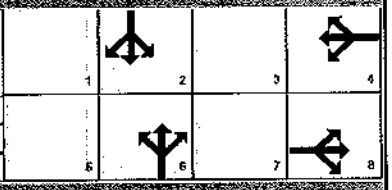
General Information				Intersection Information	
Agency	LOCHSA			Duration, h	0.250
Analyst	TIE	Analysis Date	12/6/2021	Area Type	other
Jurisdiction	CARSON CITY	Time Period	PM EXIST	PHF	0.91
Urban Street	STEWART STREET	Analysis Year	2021	Analysis Period	1> 7:00
Intersection	STEWART ST AT WAS...	File Name	WASTpME.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	14	27	14	16	43	9	20	444	38	3	228	11

Signal Information			
Cycle, s	65.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

	EB			WB			NB			SB		
Green	33.7	19.4		0.0	0.0	0.0	0.0					
Yellow	4.1	3.4		0.0	0.0	0.0	0.0					
Red	2.2	2.2		0.0	0.0	0.0	0.0					



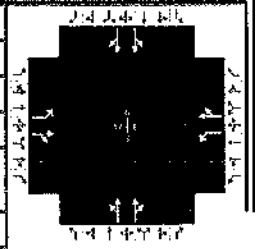
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		8		4		6		2
Case Number		6.0		6.0		8.0		8.0
Phase Duration, s		25.0		25.0		40.0		40.0
Change Period, (Y+R c), s		5.6		5.6		6.3		6.3
Max Allow Headway (MAH), s		3.3		3.3		0.0		0.0
Queue Clearance Time (gs), s		4.0		3.9				
Green Extension Time (g e), s		0.2		0.2		0.0		0.0
Phase Call Probability		1.00		1.00				
Max Out Probability		0.00		0.00				

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow Rate (v), veh/h	15	45		18	57		290		262	140		126
Adjusted Saturation Flow Rate (s), veh/h/ln	1346	1586		1361	1814		1828		1654	1861		1673
Queue Service Time (gs), s	0.5	1.3		0.6	1.5		0.0		5.9	0.0		2.6
Cycle Queue Clearance Time (gc, gs), s	2.0	1.3		1.9	1.5		5.7		5.9	2.5		2.6
Green Ratio (g/C)	0.30	0.30		0.30	0.30		0.52		0.52	0.52		0.52
Capacity (c), veh/h	482	473		489	541		1007		858	1022		867
Volume-to-Capacity Ratio (X)	0.032	0.095		0.036	0.106		0.288		0.305	0.137		0.146
Back of Queue (Q), ft/ln (50 th percentile)	4.5	13.1		5.2	16.5		57		52.3	24.8		22.7
Back of Queue (Q), veh/ln (50 th percentile)	0.2	0.5		0.2	0.6						1.0	0.9
Queue Storage Ratio (RQ) (50 th percentile)	0.00	0.00		0.00	0.00							0.00
Uniform Delay (d 1), s/veh	17.2	16.5		17.2	16.5					8.1		8.2
Incremental Delay (d 2), s/veh	0.1	0.4		0.1	0.4					0.3		0.4
Initial Queue Delay (d 3), s/veh	0.0	0.0		0.0	0.0							0.0
Control Delay (d), s/veh	17.4	16.9		17.3	16.9							8.5
Level of Service (LOS)	B	B		B	B		A	A		A		A
Approach Delay, s/veh / LOS	17.0	B		17.0	B		9.7	A		8.5		A
Intersection Delay, s/veh / LOS	10.4						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score/ LOS	2.10	B	2.10	B	1.88	B	1.88	B
Bicycle LOS Score / LOS	0.59	A	0.61	A	0.94	A	0.71	A

HCS7 Signalized Intersection Results Summary

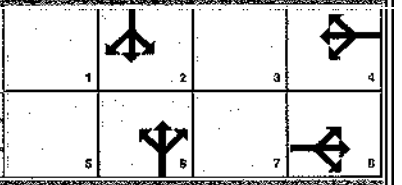
General Information				Intersection Information	
Agency	LOCHSA			Duration, h	0.250
Analyst	TTE	Analysis Date	12/6/2021	Area Type	Other
Jurisdiction	CARSON CITY	Time Period	AM	PHF	0.92
Urban Street	STEWART STREET	Analysis Year	2022 BACKGROUND	Analysis Period	1> 7:00
Intersection	STEWART ST AT WAS...	File Name	WASTAMB.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	11	19	24	15	27	6	22	205	5	5	368	17

Signal Information			
Cycle, s	65.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	33.7	19.4	0.0	0.0	0.0	0.0						
Yellow	4.1	3.4	0.0	0.0	0.0	0.0						
Red	2.2	2.2	0.0	0.0	0.0	0.0						



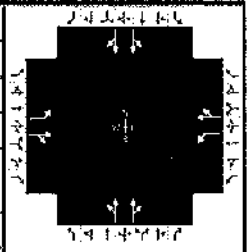
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		8		4				2
Case Number		6.0		6.0				8.0
Phase Duration, s		25.0		25.0				40.0
Change Period, (*Y+Rc*), s		5.		5.6				6.3
Max Allow Headway (*MAH*), s		3.3		3.3		0.0		0.0
Queue Clearance Time *(gs)*, s		3.4		4.0				
Green Extension Time (*ge*), s				0.2		0.0		0.0
Phase Call Probability		1.00		1.00				
Max Out Probability		0.00		0.00				

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow Rate (*v*), veh/h	12	47		16	36		130		123	223		201
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1372	1530		1359	1811		1666		1689	1864		1674
Queue Service Time *(gs)*, s	0.4	1.4		0.6	0.9		0.0		2.4	0.0		4.3
Cycle Queue Clearance Time (*gc*), s	1.3	1.4		2.0	0.9		2.3		2.4	4.2		4.3
Green Ratio (*g/C*)	0.30	0.30		0.30	0.30							0.52
Capacity (*c*), veh/h	501	457		486	541							868
Volume-to-Capacity Ratio (X)	0.024	0.102		0.034	0.066							0.231
Back of Queue (Q), ft/ln (50 th percentile)	3.5	13.7		4.8	10.2							38.2
Back of Queue (Q), veh/ln (50 th percentile)	0.1	0.5		0.2	0.4				0.9	1.7		1.5
Queue Storage Ratio (*RQ*) (50 th percentile)	0.00	0.00		0.00	0.00				0.00	0.00		0.00
Uniform Delay (*d 1*), s/veh	16.8	16.5		17.2	16.3				8.1	8.6		8.6
Incremental Delay (*d 2*), s/veh	0.1	0.4		0.1	0.2				0.3	0.5		0.6
Initial Queue Delay (*d 3*), s/veh	0.0	0.0		0.0	0.0				0.0	0.0		0.0
Control Delay (*d*), s/veh	16.9	16.9		17.4	16.6				8.5	9.0		9.2
Level of Service (LOS)	B	B		B	B		A		A			A
Approach Delay, s/veh / LOS	16.9	B		16.8	B		8.4	A		9.1		A
Intersection Delay, s/veh / LOS	10.0						A					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.10	B	2.10	B	1.88	B	1.88	B
Bicycle LOS Score / LOS	0.58	A	0.57	A	0.70	A	0.84	A

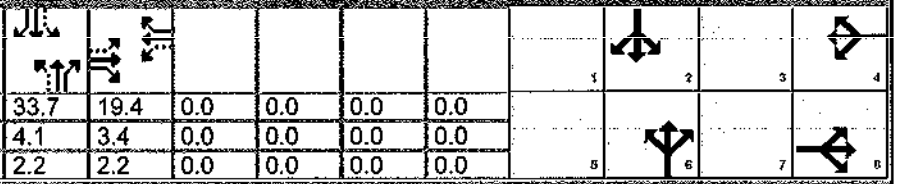
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	LOCHSA			Duration, h	0.250
Analyst	TTE	Analysis Date	12/6/2021	Area Type	Other
Jurisdiction	CARSON CITY	Time Period	PM	PHF	0.91
Urban Street	STEWART STREET	Analysis Year	2022 BACKGROUND	Analysis Period	1> 7:00
Intersection	STEWART ST AT WAS...	File Name	WASTpMB.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	14	27	14	16	43	9	20	447	38	3	229	11

Signal Information			
Cycle, s	65.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



	EB			WB			NB			SB		
Green	33.7	19.4		0.0	0.0	0.0	0.0					
Yellow	4.1	3.4		0.0	0.0	0.0	0.0					
Red	2.2	2.2		0.0	0.0	0.0	0.0					

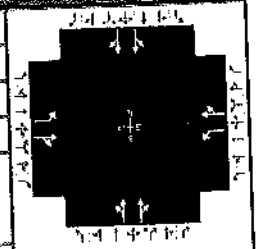
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		8		4		6		2
Case Number		6.0		6.0		8.0		8.0
Phase Duration, s		25.0		25.0		40.0		40.0
C eriod, Y+R c), s		5.6		5.6		6.3		6.3
Max Allow Headway (MAH), s		3.3		3.3		0.0		0.0
Queue Clearance Time (gs), s		4.0		3.9				
Green Extension Time (g e), s		0.2		0.2		0.0		0.0
Phase Call Probability		1.00		1.00				
Max Out Probability		0.00		0.00				

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T		T	R	L	T	R	L	T	R	
Assigned Movement	3	8		4		1	6	16	5	2	12	
Adjusted Flow Rate (v), veh/h		45		57							127	
Adjusted Saturation Flow Rate (s), veh/h/ln		1586		1814							1673	
Queue Service Time s s		1.3	0.6	1.5							2.6	
Cycle Queue Clearance Time (g c), s		1.3	1.9	1.5							2.6	
Green Ratio (g/C)		0.30		0.30							0.52	
Capacity (c), veh/h											868	
Volume-to-Capacity Ratio (X)											0.146	
Back of Queue (Q), ft/ln (50 th percentile)											22.8	
Back of Queue (Q), veh/ln (50 th percentile)								2.1			0.9	
Queue Storage Ratio (RQ) (50 th percentile)								0.00	0.00		0.00	
Uniform Delay (d 1), s/veh								9.0	8.1		8.2	
Incremental Delay (d 2), s/veh								0.9	0.3		0.4	
Initial Queue Delay (d 3), s/veh		0.0							0.0		0.0	
Control Delay (d), s/veh		16.9									8.5	
Level of Service (LOS)		B									A	
Approach Delay, s/veh / LOS		B									A	
Intersection Delay, s/veh / LOS	10.4					B						

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.10	B	2.10	B	1.88	B	1.88	B
Bicycle LOS Score/ LOS	0.59	A	0.61	A	0.95	A	0.71	A

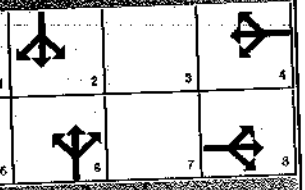
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	LOCHSA			Duration, h	0.250
Analyst	TTE	Analysis Date	12/6/2021	Area Type	Other
Jurisdiction	CARSON CITY	Time Period	AM	PHF	0.92
Urban Street	STEWART STREET	Analysis Year	2022	Analysis Period	1> 7:00
			BACKGROUND WPROJ		
rsection	STEV STEWART ST AT WAS...	File Name	WASTAMP.xus		
ject Description					



nand Information	EB			WB			NB			SB		
proach Movement	L	T	R	L	T	R	L	T	R	L	T	R
nand (v), veh/h	13	19	24	15	27	6	22	211	5	5	388	24

nal Information					Green	Yellow	Red
cle, s	65.0	Reference Phase	2	1	33.7	4.1	2.2
set, s	0	Reference Point	End	2	19.4	3.4	2.2
coordinated	No	Simult. Gap E/W	On	3	0.0	0.0	0.0
rce Mode	Fixed	Simult. Gap N/S	On	4	0.0	0.0	0.0
				5	0.0	0.0	0.0
				6	0.0	0.0	0.0
				7	0.0	0.0	0.0
				8	0.0	0.0	0.0



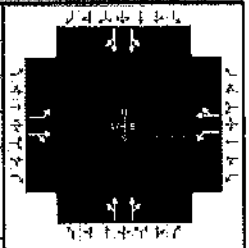
ner Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
igned Phase		8		4		6		2
ase Number		6.0		6.0		8.0	6	8.0
ase Duration, s		25.0		25.0		40.0	8.0	
Change Period, (Y+R c), s		5.6		5.6		6.3	40.0	40.0
Max Allow Headway (MAH), s		3.3		3.3		0.0	6.3	6.3
Queue Clearance Time (gs), s		3.4		4.0		0.0	0.0	0.0
Green Extension Time (g e), s		0.2		0.2		0.0		
Phase Call Probability		1.00		1.00			0.0	0.0
Max Out Probability		0.00		0.00				

ovement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow Rate (v), veh/h	14	47		16	36		133		126	239		214
Adjusted Saturation Flow Rate (s), veh/h/ln	1372	1530		1359	1811		1662		1689	1865		1666
Service Time (gs), s	0.5	1.4		0.6	0.9		0.0		2.5	0.0		4.6
-Cycle Queue Clearance Time (g c), s	1.4	1.4		2.0	0.9		2.4		2.5	4.6		4.6
Green Ratio (g/C)	0.30	0.30		0.30	0.30		0.52		0.52	0.52		0.52
Capacity (c), veh/h	501	457		486	541		927		876	1023		864
Volume-to-Capacity Ratio (X)	0.028	0.102		0.034	0.066		0.143		0.144	0.234		0.248
Back of Queue (Q), ft/ln (50 th percentile)	4.1	13.7		4.8	10.2		23.7		22.6	45.1		41.3
Back of f Queue (Q), veh/ln (50 th percent)	0.2	0.5		0.2	0.4		0.9		0.9	1.8		1.7
Queue e Storage Ratio (RQ) (50 th percentile)	0.00	0.00		0.00	0.00		0.00		0.00	0.00		0.00
Uniform Delay (d 1), s/veh	16.8	16.5		17.2	16.3		8.1		8.1	8.6		8.6
Incremental Delay (d 2), s/veh	0.1	0.4		0.1	0.2		0.3		0.3	0.5		0.7
Queue Delay (d 3), s/veh	0.0	0.0		0.0	0.0		0.0		0.0	0.0		0.0
Control Delay (d), s/veh	16.9	16.9		17.4	16.6		8.4		8.5	9.2		9.3
Level of Service (LOS)	B	B		B	B		A		A	A		A
Approach Delay, s/veh / LOS	16.9	B		16.8	B		8.5	A		9.3	A	
Intersection Delay, s/veh / LOS	10.0						B			A		

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.10	B	2.10	B	1.88	B	1.88	B
Bicycle LOS Score / LOS	0.59	B	2.10	B	0.70	A	0.86	A
		A	0.57	A				A

HCS7 Signalized Intersection Results Summary

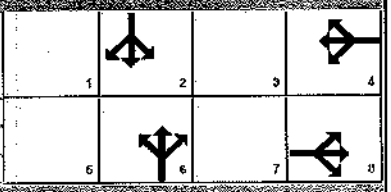
General Information				Intersection Information	
Agency	LOCHSA			Duration, h	0.250
Analyst	TTE	Analysis Date	12/6/2021	Area Type	Other
Jurisdiction	CARSON CITY	Time Period	PM	PHF	0.91
Urban Street	STEWART STREET	Analysis Year	2022	Analysis Period	1> 7:00
			BACKGROUND WPROJ		
Intersection	STEWART ST AT WAS...	File Name	WASTpMP.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	21	27	14	16	43	9	20	468	38	3	241	15

Signal Information			
Cycle, s	65.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

	EB		WB		NB		SB	
Green	33.7	19.4	0.0	0.0	0.0	0.0		
Yellow	4.1	3.4	0.0	0.0	0.0	0.0		
Red	2.2	2.2	0.0	0.0	0.0	0.0		



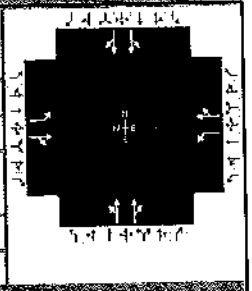
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase								2
Case Number						8.0		8.0
Phase Duration, s						40.0		40.0
Change Period, (Y+R c), s						6.3		6.3
Max Allow Headway (MAH), s						0.0		0.0
Queue Clearance Time (gs), s		4.3		3.9				
-S3reen Extension Time (g e), s								0.0
Phase Call Probability		1.00		1.00				
Max Out Probability		0.00		0.00				

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	I	R	L	T	R	L	T	R	L	T	R
Assigned Movement	3	8	18	7	4	14	1	6	16	5	2	12
fdjusted Flow Rate (v), veh/h	23	45		18	57		304		274	150		135
"djusted Saturation Flow Rate (s), veh/h/ln	1346	1586		1361	1814		1829		1657	1862		1665
"9ueue Service Time (gs), s	0.8	1.3		0.6	1.5		0.0		6.2	0.0		2.8
.cycle Queue Clearance Time (g c), s	2.3	1.3		1.9	1.5		6.1		6.2	2.7		2.8
Green Ratio	0.30	0.30		0.30	0.30		0.52		0.52	0.52		0.52
Capacity (c), veh/h	482	473		489	541		1008		859	1022		863
Volume-to-Capacity Ratio (X)	0.048	0.095		0.036	0.106		0.301		0.319	0.147		0.156
B ck of Queue (Q), ft/l (50 th per e n ti le""")-	6.8	13.1		5.2	16.5		60.2		55.5	26.7		24.5
Back of Queue (Q), veh/ln (50 th percentile)	0.3	0.5		0.2	0.6		2.4		2.2	1.1		1.0
Ou ue Storage Ratio (RQ) (50 thpercentile)	0.00	0.00		0.00	0.00		0.00		0.00	0.00		0.00
Uniform Delay (d 1), s/veh	17.4	16.5		17.2	16.5		9.0		9.0	8.2		8.2
Incremental Delay (d 2), s/veh	0.2	0.4		0.1	0.4		0.8		1.0	0.3		0.4
Initial Queue Delay (d 3), s/veh	0.0	0.0		0.0	0.0		0.0		0.0	0.0		0.0
Control Delay (d), s/veh	17.5	16.9		17.3	16.9		9.8		10.0	8.5		8.6
Level of Service (LOS)	B	B		B	B		A		B	A		A
Approach Delay, s/veh / LOS	17.1	B		17.0	B		9.9	A		8.5	A	
Intersection Delay, s/veh / LOS	10.5						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.10	B	2.10	B	1.88	B	1.88	B
Bicycle LOS Score / LOS	0.60	A	0.61	A	0.96	A	0.72	A

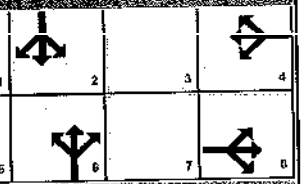
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	LOCHSA			Duration, h	0.250
Analyst	TTE	Analysis Date	12/6/2021	Area Type	other
Jurisdiction	CARSON CITY	Time Period	AM	PHF	0.92
Urban Street	STEWART STREET	Analysis Year	2050 BACKGROUND	Analysis Period	1> 7:00
Intersection	STEWART ST AT WAS...	File Name	WASTAM50B.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	13	23	29	18	32	7	26	244	6	6	437	6

Signal Information													
Cycle, s	65.0	Reference Phase	2										
Offset, s	0	Reference Point	End	Green	33.7	19.4	0.0	0.0	0.0	0.0			
Uncoordinated	No	Simult. Gap E/W	On	Yellow	4.1	3.4	0.0	0.0	0.0	0.0			
Force Mode	Fixed	Simult. Gap N/S	On	Red	2.2	2.2	0.0	0.0	0.0	0.0			



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		8		4		6		2
Case Number		6.0		6.0		8.0		8.0
Phase Duration, s		25.0		25.0		40.0		40.0
Change Period, (Y+R c), s		5.6		5.6		6.3		6.3
Max Allow Headway (MAH), s		3.3		3.3		0.0		0.0
Queue Clearance Time (gs), s		3.7		4.4				
Green Extension Time (g e), s		0.2				0.0		0.0
Phase Call Probability		1.00						
Max Out Probability		0.00		0.00				

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	3	8	18	7	4	14	1	6		5	2	12
Adjusted Flow Rate (v), veh/h	14	57		20	42		153		147	256		232
Adjusted Saturation Flow Rate(!), veh/h/ln	1364	1530		1347	1812		1644		1689	1863		1693
Queue Service Time (s), s	0.5	1.7		0.7	1.1				3.0	0.0		5.0
Cycle Queue Clearance Time (g c), s	1.6	1.7		2.4	1.1				3.0	5.0		5.0
Green Ratio (g/C)	0.30	0.30		0.30	0.30				0.52	0.52		0.52
Capacity (c), veh/h	495	457		437	541							878
Volume-to-Capacity Ratio (X)	0.029	0.124		0.041	0.078							0.265
Back of Queue (Q), ft/ln (50 th percentile)	4.1	16.7		5.8	12.1							45.1
Back of Queue (Q), veh/ln (50 th percentile)	0.2	0.7		0.2	0.5							1.8
Queue Storage Ratio (RQ) (50 th percentile)	0.00	0.00		0.00	0.00		0.00		0.00	0.00		0.00
Uniform Delay (d 1), s/veh	16.9	16.6		17.5	16.4		8.2		8.3	8.7		8.7
Incremental Delay (d 2), s/veh	0.1	0.6		0.2	0.3		0.4		0.4	0.6		0.7
Initial Queue Delay (d 3), s/veh	0.0	0.0		0.0	0.0		0.0		0.0	0.0		0.0
Control Delay (d), s/veh	17.1	17.2		17.7	16.7		8.6		8.7	9.3		9.5
Level of Service (LOS)	B	B		B	B		A		A	A		A
Approach Delay, s/veh / LOS	17.1	B		17.0	B		8.6	A		A		
Intersection Delay, s/veh / LOS	10.2							B				

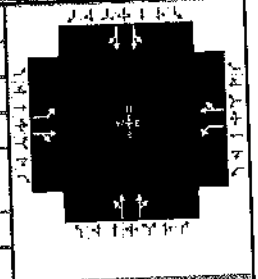
Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score/ LOS	2.10	B	2.10	B	1.88	B	1.88	B
Bicycle LOS Score / LOS	0.60	A	0.59	A	0.74	A	0.89	A

HCS HCS7 Signalized Intersection Results Summary

General Information

Agency	LOC	LOCHSA		Duration, h	0.250
Analyst	TTE	Analysis Date	12/6/2021	Area Type	Other
Jurisdiction	CARSON CITY	Time Period	PM	PHF	0.91
Urban Street	STEWART STREET	Analysis Year	2050 BACKGROUND	Analysis Period	1> 7:00
Intersection	STEV	STEWART ST AT WAS...	File Name	WASTpM50B.xus	
Project Description					

Intersection Information

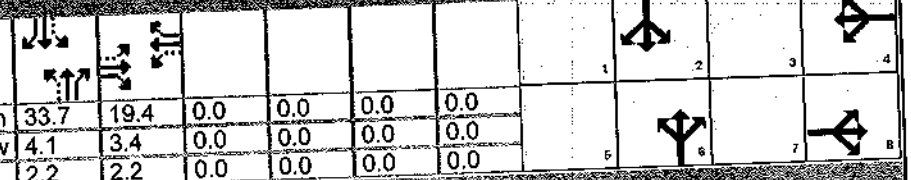


Demand Information

Approach Movement	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	17	32	17	19	51	11	24	531	45	4	273	13

Signal Information

Cycle, s	65.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



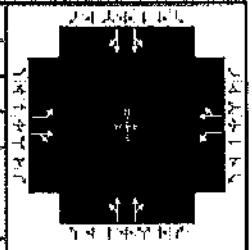
	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Timer Results								
Assigned Phase		8		4		6		2
Case Number		6.0		6.0		8.0		8.0
Phase Duration, s		25.0		25.0		40.0	8.0	40.0
Change Period, (Y+Rc), s		5.6		5.6		6.3		6.3
Max Allow Headway (MAH), s		3.3		3.3		0.0	6.3	6.3
Qu9.ue Clearance Time (gs), s		4.5		4.3		0.0	0.0	0.0
Green Extension Time (g e), s		0.2		0.2		0.0		
Phase Call Probability		1.00		1.00			0.0	0.0
Max Out Probability		0.00		0.00				

Movement Group Results	EB			WB			NB						SB		
	L	T	R	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement	3	8	18	7	4	14	1	6				12			
Assigned Movement	19	54		21	68		346	6	16	5	2	151			
Adjusted Flo":'.Rate (v), veh/h	1333	1584		1350	1812		1823		313	167		151			
Adjusted Saturation Flow Rate (s), veh/h/ln	0.7	1.6		0.7	1.8		0.0		1655	1857		1674			
Queue Service Time (gs), s	2.5	1.6		2.3	1.8		7.1		7.3	0.0		3.1			
Cycle Queue Clearance Time (gc), s	0.30	0.30		0.30	0.30		0.52		7.3	3.1		3.1			
Green Ratio (g/C)	472	473		480	541		1005		0.52	0.52		0.52			
Capacity (c), veh/h	0.040	0.114		0.043	0.126		0.345		0.300	0.101		868			
Volume-to-Capacity Ratio (X)	5.6	15.9		6.2	19.9		70.8		65.4	30.2		0.174			
Back of Queue (Q), ft/ln (50 th percentile)	0.2	0.6		0.2	0.8		2.8		2.6	1.2					
Back of Queue (Q), veh/ln (50 th percentile)	0.00	0.00		0.00	0.00		0.08		0.00	0.00					
Queue Storage Ratio (RQ) (50 th percentile)	17.5	16.6		17.4	16.6		9.2	0.00	9.3	8.3		8.3			
Uniform Delay (d 1), s/veh	0.2	0.5		0.2	0.5		0.92		1.2	0.3		0.4			
Incremental Delay (d 2), s/veh	0.0	0.0		0.0	0.0		0.09		0.0	0.0		0.0			
Initial Queue Delay (d 3), s/veh	17.7	17.0		17.6	17.1		10.2		10.5	8.6		8.7			
Control Delay (d), s/veh	B	B		B	B		B		B	A		A			
Level of Service (LOS)	17.2	B		17.2	B		10.3	B	8.7	A					
Approach Delay, s/veh / LOS	10.8						B								
Intersection Delay, s/veh / LOS															

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.10	B	2.10	B	1.88	B	1.88	B
Bicycle LOS Score / LOS	0.61	A	0.63	A	1.03	A	0.75	A

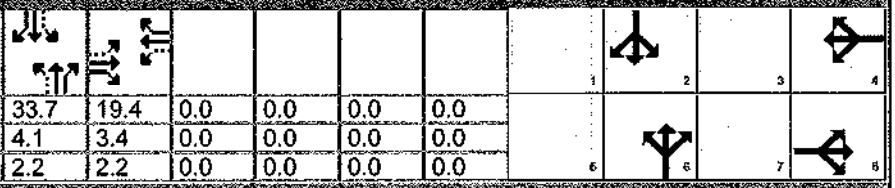
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	LOCHSA			Duration, h	0.250
Analyst	TTE	Analysis Date	12/6/2021	Area Type	Other
Jurisdiction	CARSON CITY	Time Period	AM	PHF	0.92
Urban Street	STEWART STREET	Analysis Year	2050 BACKGROUND WPROJ	Analysis Period	1> 7:00
Intersection	STEWART ST AT WAS...	File Name	WASTAM50P.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	15	23	29	18	32	7	26	250	6	6	457	27

Signal Information			
Cycle, s	65.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



	EB			WB			NB			SB		
Green	33.7	19.4		0.0	0.0	0.0	0.0					
Yellow	4.1	3.4		0.0	0.0	0.0	0.0					
Red	2.2	2.2		0.0	0.0	0.0	0.0					

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		8		4		6		2
Case Number				6.0				8.0
Phase s				25.0				40.0
Change Period, (Y+R c), s				5.6		6.3		6.3
Max Allow Headway (MAH), s		3.3		3.3		0.0		0.0
Queue Clearance Time (gs), s		3.7		4.4				
Green Extension Time (g e), s		0.2		0.2		0.0		0.0
Phase Call Probability				1.00				
Max Out Probability								

Approach Movement					T	R		T	R	L	T		R
Assigned Movement					4	14		6	16	5	2		12
Adjusted Flow Rate (v), veh/h					42				151	281			252
Adjusted Saturation Flow Rate (s), veh/h/ln					1812				1689	1863			1667
Queue Service Time (gs), s					1.1				3.1	0.0			5.6
Cycle Queue Clearance Time (g c), s					1.1								5.6
Green Ratio (g/C)					0.30								0.52
Capacity (c), veh/h													864
Volume-to-Capacity Ratio (X)													0.291
Back of Queue (Q), ft/ln (50 th percentile)													49.9
Back of Queue (Q), veh/ln (50 th percentile)					0.5								2.0
eue Storage Ratio (RQ) (50 th percentile)					0.00								0.00
Uniform Delay (d 1), s/veh				17.5	16.4								8.9
Incremental Delay (d 2), s/veh				0.2	0.3				0.4	0.7			0.9
Initial Queue Delay (d 3), s/veh				0.0	0.0				0.0	0.0			0.0
Control Delay (d), s/veh				17.7	16.7				8.7	9.5			9.7
Level of Service (LOS)				B	B				A	A			A
Approach Delay, s/veh / LOS		B		17.C		B			A	9.6			A
Intersection Delay, s/veh / LOS		10.4						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.10	B		B	1.88	B	1.88	B
Bicycle LOS Score / LOS	0.61	A	0.59	A	0.74	A	0.93	A

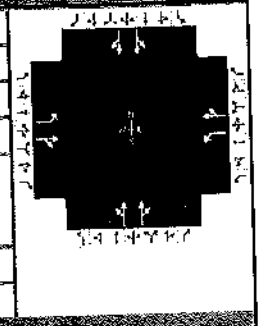
HCS7 Signalized Intersection Results Summary

General Information

Agency	LOCHSA				
Analyst	TTE	Analysis Date	12/6/2021	Area Type	Other
Jurisdiction	CARSON CITY	Time Period	PM	PHF	0.91
Urban Street	STEWART STREET	Analysis Year	2050 BACKGROUND WPROJ	Analysis Period	1> 7:00
Intersection	STE	File Name	WASTpM50P.xus		
Project Description	STEWART STA				

Intersection Information

Duration, h	0.250

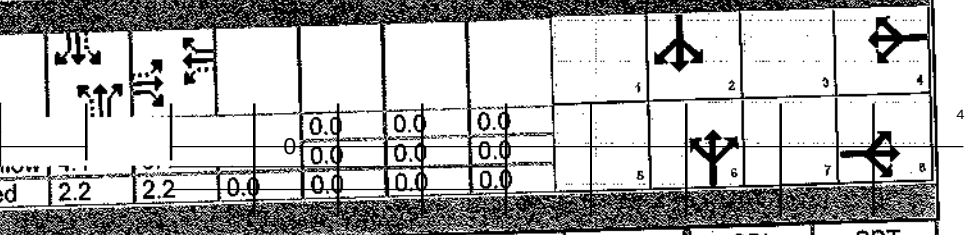


Demand Information

	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	24	32	17	19	51	11	24	552	45	4	285	17

Signal Information

Cycle, s		Reference Phase	2									
Offset, s	0	Reference Point										
Uncoordinated	No	No	Simult. Gap E/W	On	Yellow	0.0	0.0	0.0	0.0	0.0	0.0	
Force Mode	Fixed	Sin	Simult. Gap N/S	On	Red	2.2	2.2	0.0	0.0	0.0	0.0	



Timer Results

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		8		4		6		2
Case Number		6.0		6.0		8.0		8.0
Phase Duration, s		25.0		25.0				40.0
Change Period, ($Y+R_c$), s		5.6		5.6				6.3
Max Allow Headway (MAH), s		3.3		3.3		0.0		0.0
Queue Clearance Time (gs), s				4.3				
Green Extension Time (g_e), s								0.0
Phase Call Probability		1.00						
Max Out Probability		0.00		0.00				

Movement Group Results

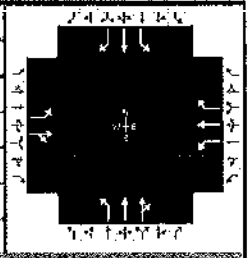
	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow Rate (v), veh/h	26	54		21	68		358		324	177		159
Adjusted Saturation Flow Rate (s), veh/h/ln	1333	1584		1350	1812		1823		1657	1858		
Queue Service Time (g_s), s	1.0	1.6		0.7	1.8		0.0		7.6	0.0		3.3
Cycle Queue Clearance Time (g_c), s	2.7	1.6		2.3	1.8		7.4		7.6	3.3		3.3
Green Ratio (g/C)	0.30	0.30		0.30	0.30		0.52		0.52	0.52		0.52
Capacity (c), veh/h	472	473		480	541		1005		859	1020		864
Volume-to-Capacity Ratio (X)	0.056	0.114		0.043	0.126		0.357		0.377	0.173		0.184
Back of Queue (Q), ft/ln (50 th percentile)	7.9	15.8		6.2	19.9		73.8		68.5	32.1		29.5
Back of Queue (Q), veh/ln (50 th percentile)	0.3	0.6		0.2	0.8		3.0		2.7	1.3		1.2
Queue Storage Ratio (RQ) (50 th percentile)	0.00	0.00		0.00	0.00		0.00		0.00	0.00		0.00
Uniform Delay (d_1), s/veh	17.6	16.6		17.4	16.6		9.3		9.4	8.3		8.3
Incremental Delay (d_2), s/veh	0.2	0.5		0.2	0.5		1.0		1.3	0.4		0.5
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0		0.0		0.0	0.0		0.0
Control Delay (d), s/veh	17.8	17.0		17.6	17.1		10.3		10.6	8.7		8.8
Level of Service (LOS)	B	B		B	B		B		B	A		A
Approach Delay, s/veh / LOS	17.3	B		17.2	B		10.5	B		8.7		A
Intersection Delay, s/veh / LOS	10.9						B					

Multimodal Results

	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.10	B	2.10	B	1.88	B	1.88	B
Bicycle LOS Score / LOS	0.62	A	0.63	A	1.05	A	0.77	A

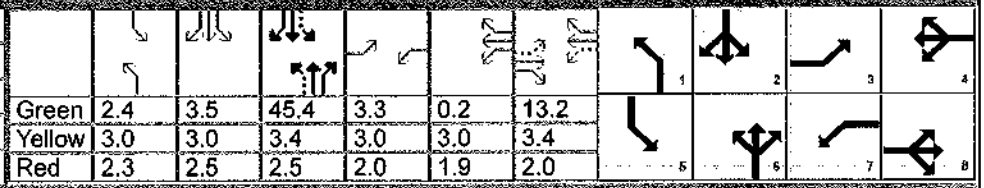
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	LOCSHA			Duration, h	0.250
Analyst	TTE	Analysis Date	12/6/2021	Area Type	Other
Jurisdiction	CARSON	Time Period	AM	PHF	0.85
Urban Street	CARSON STREET	An sis Year	2021 EXIST	Analysis Period	1> 7:00
Intersection	CARSON STREET AT...	File Name	CASTAME.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	25	76	20	120	202	209	16	373	58	260	397	61

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



	Green	Yellow	Red
1	2.4	3.0	2.3
2	3.5	3.0	2.5
3	45.4	3.4	2.5
4	3.3	3.0	2.0
5	0.2	3.0	1.9
6	13.2	3.4	2.0
7			
8			

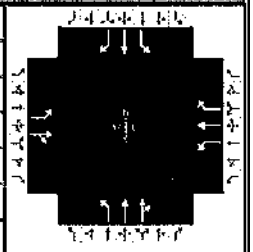
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	3	8	7	4	1	6	5	2
Case Number								3.0
Phase Duration, s							16.7	60.2
Change Period, (Y+R c), s							5.5	5.9
Max Allow Headway (MAH), s							3.3	0.0
Queue Clearance Time (gs), s	3.4	7.8	8.6				10.6	
Green Extension Time (g e), s	0.0	1.3	0.1			0.0	0.6	0.0
Phase Call Probability	0.56	1.00	0.98				1.00	
Max Out Probability	0.00	0.00	0.03	0.00	0.00		0.00	

Movement Group Results	EB			WB			NB			SB		
Approach Movement											T	R
Assigned Movement											2	12
Adjusted Flow Rate (v), veh/h											467	72
Adjusted Saturation Flow Rate (s), veh/h/ln					1870						1870	1585
Queue Service Time (gs), s					11.9	15.0	0.6	8.7	8.9	8.6	15.2	2.2
Cycl Queue Clearance Time (g c), s					11.9	15.0	0.6	8.7	8.9	8.6	15.2	2.2
G atio (g/C)					0.18	0.18	0.48	0.45	0.45	0.59	0.54	0.54
Capacity (c), veh/h					342	289	459	849	809	597	1016	861
Volume:. CaJ?acity Ratio (X)		0.475		0.443	0.696	0.849	0.041	0.304	0.308	0.512	0.460	0.083
Back of Queue (Q), ft/In 50 th percentile)		66.6		72.8	141	153.6	5.7	100.8	96.1	83.5	169.2	20.2
Back of Queue (Q), veh/ln (50 th percentile)		2.6		2.9	5.6	6.0	0.2	4.0	3.8	3.3	6.7	0.8
Queue Storage Ratio (RQ) (50 th percentile)		0.00									0.00	0.00
Uniform Delay (d 1), s/veh											13.9	10.9
Incremental Delay (d 2), s/veh											1.5	0.2
Initial Queue Delay (d 3), s/veh											0.0	0.0
<?antral Delay (d), s/veh											15.4	11.1
Level of Service (LOS)	D	D		C	D	D	B	B	B	B	B	B
Approach Delay, s/veh / LOS	39.8	D		38.9	D		18.1	B		13.6	B	
Intersection Delay, s/veh / LOS	23.8						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score/ LOS	2.13	B	2.30	B	2.10	B	1.89	B
Bicycle LOS Score / LOS	0.72	A	1.52	B	0.92	A	1.88	B

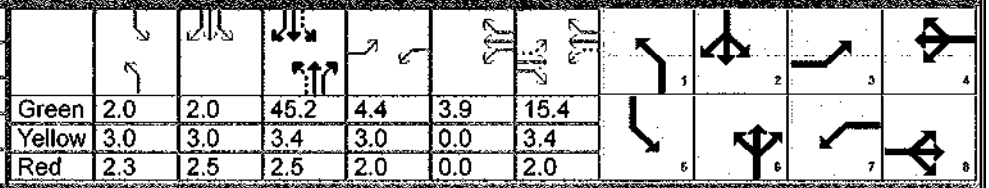
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	LOCSHA			Duration, h	0.250
Analyst	TTE	Analysis Date	12/6/2021	Area Type	Other
Jurisdiction	CARSON	Time Period	PM	PHF	0.91
Urban Street	CARSON STREET	Analysis Year	2021 EXIST	Analysis Period	1> 7:00
Intersection	CARSON STREET AT...	File Name	CASTPME.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	43	98	16	128	77	243	13	512	95	220	438	35

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	2.0	2.0	45.2	4.4	3.9	15.4		
Yellow	3.0	3.0	3.4	3.0	0.0	3.4		
Red	2.3	2.5	2.5	2.0	0.0	2.0		

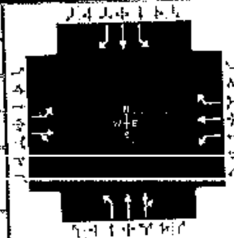
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	3	8	7	4	1	6	5	2
Case Number	1.1		1.1			4.0	1.1	3.0
Phase Duration, s	9.4	20.8	13.3			51.1	14.8	58.6
Change Period, (Y+R c), s	5.0	5.4	4.9		5.3	5.9	5.5	5.9
Max Allow Headway (MAH), s	3.3	3.4	3.3		3.3	0.0	3.3	0.0
Queue Clearance Time (gs), s	4.2	8.2	8.4		2.4		8.8	
Green Extension Time (g e), s	0.0	1.0	0.1		0.0		0.5	0.0
Phase Call Probability		1.00	0.98		0.33		1.00	
Max Out Probability	0.00	0.00	0.02	0.00	0.00		0.00	

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement											2	12
Adjusted Flow Rate (v), veh/h											481	38
Adjusted Saturation Flow Rate (s), veh/h/ln					1870						1870	1585
Queue Service Time (s), s					3.8						16.4	1.2
Cycle Queue Clearance Time (g c), s					**3.8**						16.4	**1.2**
Green Ratio (g/C)					0.19						0.53	0.53
Capacity (c), veh/h											986	835
Volume-to-Capacity Ratio (**X**)											0.488	0.046
Back of Queue (Q), ft/ln (50 th percentile)											**184.2**	11.1
Back of Queue (Q), veh/ln (50 th percentile)											7.3	0.4
Queue Storage Ratio (RQ) (50 th percentile)	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d 1), s/veh	33.0	38.4		31.0	34.1	39.1	14.7	18.4	18.4	12.5	15.1	11.5
Incremental Delay (d 2), s/veh	0.1	0.4		0.3	0.1	3.0	0.0	1.4	1.5	0.3	1.7	0.1
Initial Queue Delay (d 3), s/veh	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	33.1	38.8		31.3	34.2	42.2	14.7	19.8	19.9	12.7	16.8	11.6
eve! of Service (LOS)	C	D		C	C	D	B	B	B	B	B	B
Approach Delay, s/veh / LOS	37.3	D		37.7	D		19.8	B		15.2	B	

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.13	B	2.30	B	2.10	B	1.89	B
Bicycle LOS Score / LOS	0.77	A	1.30	A	1.05	A	1.74	B

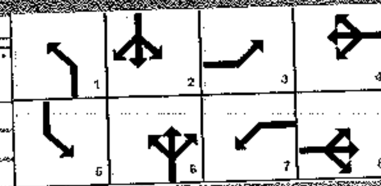
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	LOCSHA			Duration, h	0.250
Analyst	TTE	Analysis Date	12/6/2021	Area Type	Other
Jurisdiction	CARSON	Time Period	AM	PHF	0.85
Urban Street	CARSON STREET	Analysis Year	2022 BACKGROUND	Analysis Period	1> 7:00
Intersection	CARSON STREET	File Name	CASTAMB.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	25	76	20	121	203	210	16	375	58	262	399	61

Signal Information										
Cycle, s	100.0	Reference Phase	2							
Offset, s	0	Reference Point	End	Green	2.4	3.6	45.2	3.3	0.2	13.2
Uncoordinated	No	Simult. Gap E/W	On	Yellow	3.0	3.0	3.4	3.0	3.0	3.4
Force Mode	Fixed	Simult. Gap N/S	On	Red	2.3	2.5	2.5	2.0	1.9	2.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	3	8	7	4	1	6	5	2
Case Number	1.1	4.0	1.1	3.0	1.1	4.0	1.1	3.0
Phase Duration, s	8.3	18.6	13.5	23.7	7.7	51.1	16.8	60.2
Change Period, (Y+R c), s	5.0	5.4	4.9	5.4	5.3	5.9	5.5	5.9
Max Allow Headway (MAH), s	3.3	3.3	3.3	3.3	3.3	0.0	3.3	0.0
Queue Clearance Time (g s), s	3.4	7.8	8.6	17.1	2.6		10.7	
Green Extension Time (g e), s	0.0	1.3	0.1	1.3	0.0	0.0	0.6	0.0
Phase Call Probability	0.56	1.00	0.98	1.00	0.41		1.00	
Max Out Probability	0.00	0.00	0.03	0.00	0.00		0.00	

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow Rate (v), veh/h	29	113		142	239	247	19	259	250	308	469	
Adjusted Saturation Flow Rate (s), veh/h/ln	1781	1803		1781	1870	1585	1781	1870	1783	1781	1870	1585
Queue Service Time (g s), s	1.4	5.8		6.6	12.0	15.1	0.6	8.8	8.9	8.7	15.3	2.2
Cycle Queue Clearance Time (g c), s	1.4	5.8		6.6	12.0	15.1	0.6	8.8	8.9	8.7	15.3	2.2
Green Ratio (g/C)	0.17	0.13		0.24	0.18	0.18	0.48	0.45	0.45	0.59	0.54	0.54
Capacity (c), veh/h	182	238		320	343	291	457	846	806	596	1015	860
Volume-to-Capacity Ratio (X)	0.162	0.474		0.445	0.696	0.850	0.041	0.307	0.310	0.517	0.462	0.083
Back of Queue (Q), ft/ln (50 th percentile)	15.7	66.5		73.3	141.5	154.3	5.8	101.5	96.7	84.4	170.8	20.3
Back of Queue (Q), veh/ln (50 th percentile)	0.6	2.6		2.9	5.6	6.1	0.2	4.0	3.9	3.3	6.7	0.8
Queue Storage Ratio (RQ) (50 th percentile)	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d 1), s/veh	35.8	40.2		31.9	38.2	39.5	14.2	17.4	17.5	11.3	14.0	11.0
Incremental Delay (d 2), s/veh	0.2	0.5		0.4	1.0	2.7	0.0	0.9	1.0	0.3	1.5	0.2
Initial Queue Delay (d 3), s/veh	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	35.9	40.7		32.3	39.2	42.2	14.2	18.4	18.5	11.6	15.5	11.1
Level of Service (LOS)	D	D		C	D	D	B	B	B	B	B	B
Approach Delay, s/veh / LOS	39.7	D		38.8	D		18.3	B		13.7	B	
Intersection Delay, s/veh / LOS	23.9						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.13	B	2.30	B	2.10	B	1.89	
Bicycle LOS Score / LOS	0.72	A	1.52	B	0.92	A	1.89	

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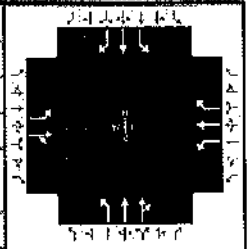
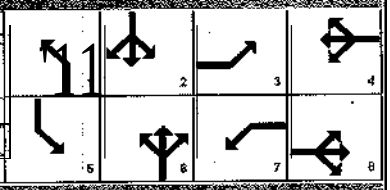
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	LOCSHA			Duration, h	0.250
Analyst	TTE	Analysis Date_	12/6/2021	Area Type	Other
Jurisdiction	CARSON	Time Period	PM	PHF	0.91
Urban Street	CARSON STREET	Analysis Year	2022 BACKGROUND	Analysis Period	1> 7:00
Intersection	CARSON STREET AT...	File Name	CASTPMB.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	43	99	16	129	77	244	13	515	96	221	440	35

Signal Information					EB		WB			NB			SB		
Cycle, s	100.0	Reference Phase	2												
Offset, s	0	Reference Point	End	Green	2.0	2.1	45.1	4.4	4.0	15.4					
Uncoordinated	No	Simult. Gap E/W	On	Yellow	3.0	3.0	3.4	3.0	0.0	3.4					
Force Mode	Fixed	Simult. Gap N/S	On	Red	2.3	2.5	2.5	2.0	0.0	2.0					



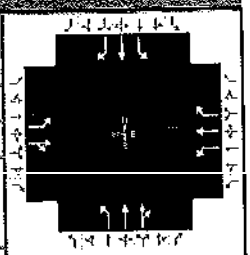
Timer Results									
Assigned Phase	3	8	7	4	1	6	5		2
Case Number									3.0
Phase Duration, s									58.5
Change Period, ($Y+R_c$), s									5.9
Allow Headway (MAH), s									0.0
Queue Clearance Time (g_s), s								8.9	
Green Extension Time (g_e), s						0.0	0.5		0.0
Phase Call Probability								1.00	
Max Out Probability	0.00	0.00	0.02	0.00	0.00		0.00		

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow Rate (v), veh/h	47	126		142	85	268	14	344	327	243	484	38
Adjusted Saturation Flow Rate (s), veh/h/ln	1781	1825		1781	1870	1585	1781	1870	1768	1781	1870	1585
Queue Service Time (g_s), s	2.2	6.3		6.5	3.8	16.4	0.4	12.4	12.5	6.9	16.5	1.2
Cycle Queue Clearance Time (g_c), s	2.2	6.3		6.5	3.8	16.4	0.4	12.4	12.5	6.9	16.5	1.2
Green Ratio (g/C)	0.20	0.15		0.25	0.19	0.19	0.47	0.45	0.45	0.56	0.53	0.53
Capacity (c), veh/h	329	282		338	363	308	418	843	797	488	985	834
Volume-to-Capacity Ratio (X)	0.144	0.448		0.419	0.233	0.872	0.034	0.408	0.411	0.498	0.491	0.046
Back of Queue (Q), ft/ln (50 th percentile)	24.3	72.6		71.6	44.7	168.1	4.4	143.8	135.2	68.2	185.8	11.1
Back of Queue (Q), veh/ln (50 th percentile)	1.0	2.9		2.8	1.8	6.6	0.2	5.7	5.4	2.7	7.3	0.4
Queue Storage Ratio (RQ) (50 th percentile)	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d_1), s/veh	33.0	38.4		30.9	34.0	39.1	14.8	18.5	18.5	12.5	15.1	11.5
Incremental Delay (d_2), s/veh	0.1	0.4		0.3	0.1	3.0	0.0	1.5	1.6	0.3	1.8	0.1
Initial Queue Delay (d_3), s/ve	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	33.1	38.8		31.2	34.1	42.1	14.8	20.0	20.1	12.8	16.9	11.6
Level of Service (LOS)	C	D		C	C	D	B	B	C	B	B	B
Approach Delay, s/veh / LOS	37.3	D		37.6	D		19.9	B		15.3	B	
Intersection Delay, s/veh / LOS	23.8						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.13	B	2.30	B	2.10	B	1.89	B
Bicycle LOS Score/ LOS	0.77	A	1.30	A	1.05	A	1.75	B

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	LOCSHA			Duration, h	0.250
Analyst	TTE	Analysis Date	12/6/2021	Area Type	Other
Jurisdiction	CARSON	Time Period	AM	PHF	0.85
Urban Street	CARSON STREET	Analysis Year	2022 BACKGROUND W PROJ	Analysis Period	1> 7:00
Intersection	CARSON STREET AT...	File Name	CASTAMP.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	25	76	20	121	203	217	16	375	58	264	399	61

Signal Information													
Cycle, s	100.0	Reference Phase	2										
Offset, s	0	Reference Point	End	Green	2.4	3.7	44.5	3.3	0.2	13.8			
Uncoordinated	No	Simult. Gap E/W	On	Yellow	3.0	3.0	3.4	3.0	3.0	3.4			
Force Mode	Fixed	Simult. Gap N/S	On	Red	2.3	2.5	2.5	2.0	1.9	2.0			

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	3	8	7	4	1	6	5	2
Case Number	1.1	4.0	1.1	3.0	1.1	4.0	1.1	3.0
Phase Duration, s	8.3	19.2	13.4	24.3	7.7	50.4	17.0	59.7
Change Period, (Y+R_c), s	5.0	5.4	4.9	5.4	5.3	5.9	5.5	5.9
Max Allow Headway (MAH), s	3.3	3.3	3.3	3.3	3.3			0.0
Queue Clearance Time (g_s), s	3.4	7.8	8.6	17.6	2.6		0.6	
Green Extension Time (g_e), s	0.0	1.3	0.1	1.3	0.0	0.0	0.0	0.0
Phase Call Probability	0.56	1.00	0.98	1.00	0.41		1.00	
Max Out Probability	0.00	0.00	0.03	0.00	0.00		0.00	

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow Rate (v), veh/h	29	113		142	239	255	19	259	250	311	469	72
Adjusted Saturation Flow Rate (s), veh/h/ln	1781	1803		1781	1870	1585	1781	1870	1783	1781	1870	1585
Queue Service Time (g_s), s	1.4	5.8		6.6	11.9	15.6	0.6	8.9	9.1	8.9	15.5	2.2
Queue Clearance Time (g_c), s	1.4	5.8		6.6	11.9	15.6	0.6	8.9	9.1	8.9	15.5	2.2
Green Ratio (g/C)	0.17	0.14		0.24	0.19	0.19	0.47	0.45	0.45	0.58	0.54	0.54
Capacity (c), veh/h	188	248		327	353	299	450	832	793	592	1005	852
Volume-to-Capacity Ratio (X)	0.156	0.455		0.436	0.677	0.854	0.042	0.312	0.315	0.524	0.467	0.084
Back of Queue (Q), ft/ln (50 th percentile)	15.6	66		72.8	140.3	159.3	5.8	103.1	98.3	86.8	173	20.6
Back of Queue (Q), veh/ln (50 th percentile)	0.6	2.6		2.9	5.5	6.3	0.2	4.1	3.9	3.4	6.8	0.8
Queue Storage Ratio (RQ) (50 th percentile)	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Uniform Delay (d_1), s/veh	35.3	39.7		31.5	37.7	39.2	14.6	17.9	17.9	11.6	14.3	11.2
Incremental Delay (d_2), s/veh	0.1	0.5		0.3	0.9	2.7	0.0	1.0	1.0	0.3	1.6	0.2
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	35.5	40.1		31.8	38.6	42.0	14.6	18.9	19.0	11.9	15.8	11.4
Level of Service (LOS)	D	D		C	D	D	B	B	B	B	B	B
Approach Delay, s/veh / LOS	39.2	D		38.4	D		18.7	B		14.0	B	
Intersection Delay, s/veh / LOS	24.0						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score/ LOS	2.13	B	2.30	B	2.10	B	1.89	B
Bicycle LOS Score / LOS	0.72	A	1.54	B	0.92	A	1.89	B

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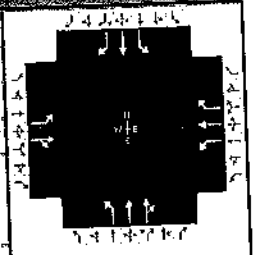
HCS7 Signalized Intersection Results Summary

General Information

- gency	LOCSHA				
Analyst	TTE	Analysis Date	12/6/2021	Area Type	Other
Jurisdiction	CARSON	Time Period	PM	PHF	0.91
Urban Street	CARSON STREET	Analysis Year	2022 BACKGROUND WPROJ	Analysis Period	1> 7:00
'section	CARS	CARSON STREET AT...	File Name	CASTPMP.xus	
ect Description					

Intersection Information

Duration, h	0.250
Area Type	Other
PHF	0.91
Analysis Period	1> 7:00



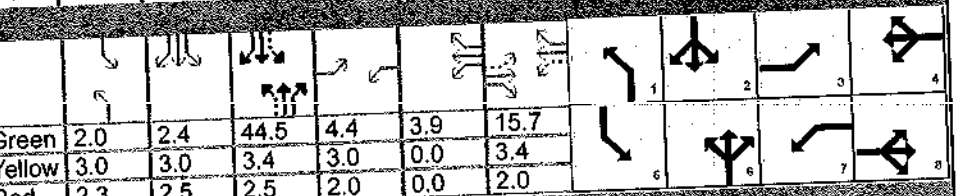
nand Information

roach Movement	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
nand (v), veh/h	43	99	16	129	77	248	13	515	96	228	440	35

nal Information

cle, s	100.0	Reference Phase	2
set, s	0	0	Reference Point
coordinated	No	No	Simult. Gap E/W
ce Mode	Fixed	Simu	Simult. Gap N/8

Green	2.0	2.4	44.5	4.4	3.9	15.7		
Yellow	3.0	3.0	3.4	3.0	0.0	3.4		
Red	2.3	2.5	2.5	2.0	0.0	2.0		



ner Results

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
signed Phase	3	8	7	4	1	6	5	2
Case Number	1.1	4.0	1.1	3.0	1.1	4.0	1.1	3.0
Phase Duration, s							5	2
~Change Period, (Y+R c), s							15.2	58.3
!v1ax Allow Headway (MAH), s							5.5	5.9
Queue Clearance Time (gs), s							3.3	0.0
Green Extension Time (g e), s							9.2	
Phase Call Probability							0.5	0.0
Max Out Probability	0.00	0.00	0.02	0.00	0.00		0.00	

Movement Group Results

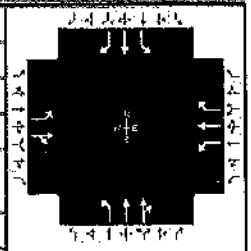
	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												12
Assigned Movement								6			2	38
Adjusted Flow Rate (v), veh/h												1585
Adjusted Saturation Flow Rate (s), veh/h/ln												38
Queue Service Time (gs), s												1585
Cycle Queue Clearance Time (g c), s												1.2
G!een Ratio (g/C)												1.2
	0.142	0.440		0.415	0.230	0.873	0.034	0.414	0.416	0.513	0.494	0.040
Volume-to-Capacity Ratio (X)	24.2	72.3		71.4	44.5	70.7	4.5	145.7	137	71.3	187.3	11.2
- a k of Queue (Q), ft/ln (50 th percentile)	1.0	2.8		2.8	1.8	6.7	0.2	5.7	5.5	2.8	7.4	0.4
- ack of Queue (Q), veh/ln (50 th percentile)	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Queue Storage Ratio (RQ) (50 th percentile)	32.8	38.1		30.7	33.8	38.9	15.0	18.9	18.9	12.8	15.3	11.6
Uniform Delay (d 1), s/veh	0.1	0.4		0.3	0.1	3.0	0.0	1.5	1.6	0.3	1.8	0.1
Incremental Delay (d 2), s/veh									1.6	0.3	0.0	0.0
Initial Queue Delay (d 3), s/veh									0.0	0.0	17.1	11.7
Control Delay (d), s/veh									20.5	13.1	B	B
J::.evel of Service (LOS)									C	B	8	B
Approach Delay, s/veh / LOS									C	15.5		8
Intersection Delay, s/veh / LOS												

Multimodal Results

	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.13	B	2.30	B	2.10	B	1.89	B
Bicycle LOS Score / LOS	0.77	A	1.31	A	1.05	A	1.76	119

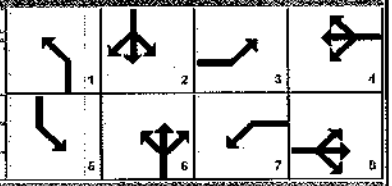
IHCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	LOCSHA			Duration, h	0.250
Analyst	TTE	Analysis Date	12/6/2021	Area Type	Other
Jurisdiction	CARSON	Time Period	AM	PHF	0.85
Urban Street	CARSON STREET	nalysis Year	2050 BACKGROUND	Analysis Period	1> 7:00
Intersection	CARSON STREET AT...	File Name	CASTAM50B.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	30	91	24	143	241	249	19	446	69	311	475	73

Signal Information					EB			WB			NB			SB		
Cycle, s	100.0	Reference Phase	2		L	T	R	L	T	R	L	T	R	L	T	R
Offset, s	0	Reference Point	End	Green	2.8	6.2		38.8	3.7	0.9	15.5					
Uncoordinated	No	Simult. Gap E/W	On	Yellow	3.0	3.0		3.4	3.0	3.0	3.4					
Force Mode	Fixed	Simult. Gap N/S	On	Red	2.3	2.5		2.5	2.0	1.9	2.0					



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	3	8	7	4	1	6	5	2
Case Number	1.1	4.0	1.1	3.0	1.1	4.0	1.1	3.0
Phase Duration, s	8.7	20.9	14.5	26.7	8.1	44.7	19.8	56.5
Change Period, (Y+R c), s	5.0	5.4	4.9	5.4	5.3	5.9	5.5	5.9
Max Allow Headway (MAH), s	3.3	3.3	3.3	3.3	3.3	0.0	3.3	0.0
Queue Clearance Time (gs), s	3.6	8.9	9.6	19.8	2.7		13.6	
Green Extension Time (g e), s	0.0	1.5	0.1	1.5	0.0	0.0	0.7	0.0
Phase Call Probability	0.62	1.00	0.99	1.00	0.46		1.00	
Max Out Probability	0.00	0.00	0.10	0.00	0.00		0.00	

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow Rate (v), veh/h	35	135		168	284	293	22	309	297	366	559	86
Saturation Flow Rate (s), veh/h/ln	1781	1803		1781	1870	1585	1781	1870	1783	1781	1870	1585
Queue Service Time s s	1.6	6.9		7.6	14.1	17.8	0.7	12.1	12.2	11.6	21.1	2.8
Cycle Queue Clearance Time (g c), s	1.6	6.9		7.6	14.1	17.8	0.7	12.1	12.2	11.6	21.1	2.8
Green Ratio (g/C)	0.19	0.16		0.27	0.21	0.21	0.42	0.39	0.39	0.55	0.51	0.51
Capacity (c), veh/h	197	280		353	399	338	355	726	692	543	945	801
Volume-to-Capacity Ratio (X)	0.180	0.483		0.477	0.711	0.867	0.063	0.426	0.429	0.673	0.591	0.107
Back of Queue (Q), ft/ln (50 th percentile)	18.3	78.2		83.5	165.3	183.5	7.8	144.2	136.8	115.9	242.4	27
Back of Queue Q veh/ln 50 th, [illegible]	0.7	3.1		3.3	6.5	7.2	0.3	5.7	5.5	4.6	9.5	1.1
Queue Storage Ratio (RQ) (59 th percentile)	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d 1), s/veh	33.8	38.6		29.7	36.5	38.0	17.9	22.4	22.5	14.5	17.4	12.9
Incremental Delay (d 2), s/veh	0.2	0.5		0.4	0.9	3.6	0.0	1.8	1.9	0.5	2.7	0.3
Initial Queue Delay (d 3), s/veh	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	33.9	39.1		30.1	37.4	41.5	18.0	24.2	24.4	15.1	20.1	13.2
Level of Service (LOS)	C	D		C	D	D	B	C	C	B	C	B
Approach Delay, s/veh / LOS	38.0	D		37.4	D		24.1	C		17.7	B	
Intersection Delay, s/veh / LOS	26.4						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.13	B	2.29	B	2.11	B	1.90	B
Bicycle LOS Score / LOS	0.77	A	1.72	B	1.01	A	2.16	B

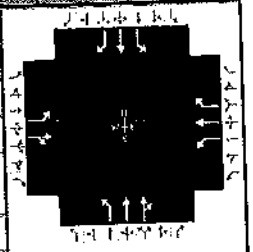
HCS7 Signalized Intersection Results Summary

General Information

Agency	LOCSHA			Duration, h	0.250
Analyst		Analysis Date	12/6/2021	Area Type	Other
Jurisdiction	CARSON	Time Period	PM	PHF	0.91
Urban Street	CARSON STREET	Analysis Year	2050 BACKGROUND	Analysis Period	1> 7:00
Intersection	CAR	File Name	M50B.xus		
Project Description					

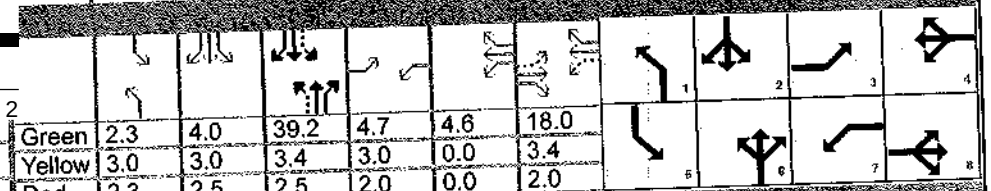
Intersection Information

Duration, h 0.250



Demand Information

Approach	EB			WB			NB			SB		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	51	117	19	153	92	290	16	612	114	263	523	42



Signal Information

Cycle, s	100.0	Reference Phase	2	Phase	1	2	3	4	5	6	7	8
Offset, s	0	Reference Point	End	Green	2.3	4.0	39.2	4.7	4.6	18.0		
Uncoordinated	No	Simult. Gap E/W	On	Yellow	3.0	3.0	3.4	3.0	0.0	3.4		
Force Mode	Fixed	Simult. Gap N/S	On	Red	2.3	2.5	2.5	2.0	0.0	2.0		

Timer Results

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	3	8	7	4	1	6	5	2
Case Number	1.1	4.0	1.1	3.0	1.1	4.0	1.1	3.0
Phase Duration, s	9.7	23.4	14.3	28.0	7.6	45.1	17.2	54.6
Change Period, (Y+Rc), s	5.0	5.4	4.9	5.4	5.3	5.9	5.5	5.9
Max Allow Headway (MAH), s	3.3	3.4	3.3	3.4	3.3	0.0	3.3	0.0
Queue Clearance Time (gs), s	4.5	9.3	9.4	21.5	2.6		11.1	
Green Extension Time (g_e), s	0.0	1.3	0.1	1.2	0.0	0.0	0.5	0.0
Phase Call Probability	0.79	1.00	0.99	1.00	0.39		1.00	
Max Out Probability	0.00	0.00	0.08	0.01	0.00		0.00	

Movement Group Results

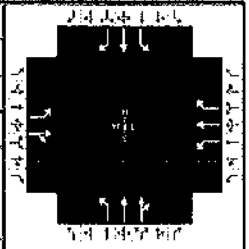
Approach	EB			WB			NB			SB		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow Rate (v), veh/h	56	149		168	101	319	18	410	388	289	575	
Adjusted Saturation Flow Rate (s), veh/h/ln	1781	1824		1781	1870	1585	1781	1870	1768	1781	1870	1585
Queue Service Time (gs), s	2.5	7.3		7.4	4.4	19.5	0.6	17.1	17.1	9.1	22.7	1.5
Cycle Queue Clearance Time (g_c), s	2.5	7.3		7.4	4.4	19.5	0.6	17.1	17.1	9.1	22.7	1.5
Green Ratio (g/C)	0.23	0.18		0.29	0.23	0.23	0.41	0.39	0.39	0.53	0.49	0.49
Capacity (c), veh/h	366	329		373	423	359	314	733	693	430	911	772
Volume-to-Capacity Ratio (X)	0.153	0.455		0.451	0.239	0.889	0.056	0.559	0.560	0.672	0.631	0.060
Back of Queue (Q), ft/ln (50 th percentile)	27.7	83.9		80.8	51.4	210.1	6.2	205.5	192.7	93.2	265	14.7
Back of Queue (Q), veh/ln (50 th percentile)	1.1	3.3		3.2	2.0	8.3	0.2	8.1	7.7	3.7	10.4	0.6
Queue Storage Ratio (RQ) (50 th percentile)	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d_1), s/veh	30.8	36.6		28.2	31.6	37.5	18.5	23.7	23.7	16.4	19.0	13.5
Incremental Delay (d_2), s/veh	0.1	0.4		0.3	0.1	7.7	0.0	3.1	3.3	0.7	3.3	0.1
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	30.9	37.0		28.5	31.8	45.2	18.5	26.8	27.0	17.1	22.3	13.7
Level of Service (LOS)	C	D		C	C	D	B	C	C	B	C	B
Approach Delay, s/veh / LOS	35.3	D		38.1	D		26.7	C		20.2	C	
Intersection Delay, s/veh / LOS	27.7							C				C

Multimodal Results

	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.13	B	2.29	B	2.11	B	1.90	
Bicycle LOS Score / LOS	2.13	B	2.29	A	2.11	B	1.99	
	0.83	A	1.46		1.16	A		

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	LOCSHA			Duration, h	0.250
Analyst	TTE	Analysis Date	12/6/2021	Area Type	Other
Jurisdiction	CARSON	Time Period	AM	PHF	0.85
, Urban Street	CARSON STREET	Analysis Year	2050 BACKGROUND WPROJ	Analysis Period	1> 7:00
Intersection	CARSON STREET AT...	File Name	CASTAM50P.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	30	91	24	143	241	256	19	446	69	313	475	73

Signal Information													
Cycle, s	100.0	Reference Phase	2										
Offset, s	0	Reference Point	End										
Uncoordinated	No	Simult. Gap E/W	On	Green	2.8	6.5	38.1	3.7	0.8	16.1			
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	3.0	3.0	3.4	3.0	3.0	3.4			
				Red	2.3	2.5	2.5	2.0	1.9	2.0			

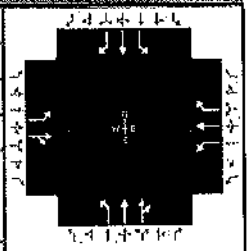
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	3	8	7	4			5	2
Case Number				3.0			1.1	3.0
Phase Duration, s				27.2			20.0	55.9
C',:1l19e Period, (*Y+R c*), s				5.4			5.5	5.9
Max Allow Headway (*MAH),* s		3.3	3.3	3.3			3.3	0.0
Queue Clearance Time (gs), s		8.8	9.5	20.3			13.8	
Green Extension Time (*g e*), s		1.6	0.1	1.5				0.0
Phase Call Probability		1.00	0.99	1.00	0.46		1.00	
Max Out Probability	0.00	0.00	0.09	0.01	0.00		0.00	

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T		T		L	T	R	
Assigned Movement	3	8	18	7	4		6		5	2	12	
Adjusted Flow Rate (*v*), veh/h	35	135		168	284		309			559	86	
Adjusted Saturation Flow Rate (,!), veh/h/ln	1781	1803		1781	1870	1585	1781	1870	1783	1781	1870	1585
Queue Service Time (*gs),* s	1.6	6.8		7.5	14.0	18.3	0.8	12.3	12.4	11.8	21.3	2.9
Cycle Queue Clearance Time (*g c*), s	1.6	6.8		7.5	14.0	18.3	0.8	12.3	12.4	11.8	21.3	2.9
Green Ratio (g/C)	0.20	0.16		0.28	0.22	0.22	0.41	0.38	0.38	0.55	0.50	0.50
Capacity (*c*), veh/h	203	290		359	408	346	349	712	679	540	936	793
Volume to-Capacity Ratio (X)	0.174	0.466		0.468	0.694	0.870	0.064	0.434	0.437	0.682	0.597	0.108
Back of Queue (Q), ft/ln (50 th percel!tile)	18.1	77.6		83	163.9	190.4	8	146.5	139	119.1	245.6	27.4
Back of Qu"eue (Q), veh/ln (50 th per centile)	0.7	3.1		3.3	6.5	7.5	0.3	5.8	5.6	4.7	9.7	1.1
Queue Storage Ratio (*RQ*) (50 th percentile)	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (*d 1*), s/veh	33.3	38.1		29.3	36.0	37.7	18.4	23.0	23.0	14.9	17.8	13.2
Incremental Delay (*d 2*), s/veh	0.1	0.4		0.4	0.8	4.4	0.0	1.9			2.8	0.3
Initial Queue Delay (*d 3*), s/veh	0.0	0.0		0.0	0.0	0.0	0.0	0.0			0.0	0.0
Control Delay (*d*), s/veh	33.5	38.5		29.7	36.8	42.1	18.4	24.9			20.6	13.5
- el of Service (LOS)	C	D		C	D	D	B	C			C	B
- pproach Delay, s/veh / LOS	37.5	D		37.3	D		24.7	C		18.1	B	
Intersection Delay, s/veh / LOS	26.7						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.13	B	2.29	B	2.11	B	1.90	B
Bicycle LOS Score / LOS	0.77	A	1.73	B	1.01	A	2.16	B

HCS7 Signalized Intersection Results Summary

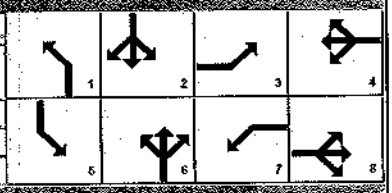
General Information				Intersection Information	
Agency	LOCSHA			Duration, h	0.250
Analyst	TTE	Analysis Date	12/6/2021	Area Type	Other
Jurisdiction	CARSON	Time Period	PM	PHF	0.91
Urban Street	CARSON STREET	Analysis Year	2050 BACKGROUND WPROJ	Analysis Period	1> 7:00
Intersection	CARSON STREET AT...	File Name	CASTPM50P.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	51	117	19	153	92	294	16	612	114	270	523	42

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	2.3	4.4		38.5	4.7	4.6	18.3					
Yellow	3.0	3.0		3.4	3.0	0.0	3.4					
Red	2.3	2.5		2.5	2.0	0.0	2.0					



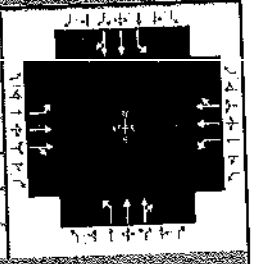
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	3	8	7	4	1	6	5	2
Case Number	1.1	4.0	1.1	3.0	1.1	4.0	1.1	3.0
Phase Duration, s	9.7	23.7	14.3	28.3	7.6	44.4	17.5	54.3
Change Period, ($Y+R_c$), s	5.0	5.4	4.9	5.4	5.3	5.9	5.5	5.9
Max Allow Headway (*MAH*), s	3.3	3.4	3.3	3.4	3.3	0.0	3.3	0.0
Queue Clearance Time (g_s), s	4.5	9.3	9.4	21.7	2.6		11.5	
Green Extension Time (g_e), s	0.0	1.3	0.1	1.2	0.0	0.0	0.5	0.0
Phase Call Probability	0.79	1.00	0.99	1.00	0.39		1.00	
Max Out Probability	0.00	0.00	0.08	0.01	0.00		0.00	

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow Rate (*v*), veh/h	56	149		168	101	323	18	410	388	297	575	46
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1781	1824		1781	1870	1585	1781	1870	1768	1781	1870	1585
Queue Service Time (gs), s	2.5	7.3		7.4	4.4	19.7	0.6	17.2	17.3	9.5	22.9	1.5
Cycle Queue Clearance Time (g_c), s	2.5	7.3		7.4	4.4	19.7	0.6	17.2	17.3	9.5	22.9	1.5
Green Ratio (*g/C)*	0.23	0.18		0.29	0.23	0.23	0.41	0.39	0.39	0.53	0.48	0.48
Capacity (*c*), veh/h	370	334		376	428	363	311	721	681	431	906	768
Volume-to-Capacity Ratio (*X)*	0.152	0.447		0.447	0.236	0.890	0.057	0.568	0.569	0.689	0.634	0.060
Back of Queue (Q), ft/ln (50 th percentile)	27.6	83.6		80.5	51.2	213.9	6.2	208.4	195.1	96.9	267.3	14.8
Back of Queue (Q), veh/ln (50 th percentile)	1.1	3.3		3.2	2.0	8.4	0.2	8.2	7.8	3.8	10.5	0.6
Queue Storage Ratio *RQ* (50 th percentile)	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d_1), s/veh	30.6	36.3		28.0	31.4	37.3	18.8	24.2	24.2	16.8	19.2	13.7
Incremental Delay (d_2), s/veh	0.1	0.3		0.3	0.1	8.1	0.0	3.2	3.4	0.7	3.4	0.1
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (*d*), s/veh	30.7	36.7		28.3	31.5	45.5	18.8	27.4	27.6	17.5	22.6	13.8
Level of Service (LOS)	C	D		C	C	D	B	C	C	B	C	B
Approach Delay, s/veh / LOS	35.0	D		38.2	D		27.3	C		20.5	C	
Intersection Delay, s/veh / LOS	28.0						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score/ LOS	2.13	B	2.29	B	2.11	B	1.90	B
Bicycle LOS Score / LOS	0.83	A	1.46	A	1.16	A	2.00	B

HCS7 Signalized Intersection Results Summary

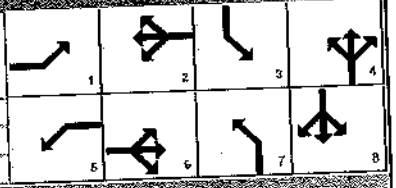
General Information		Analysis		Intersection Information	
Agency	LOCHSA	Analysis Date	12/7/2021	Duration, h	0.250
Analyst	TTE	Time Period	EXI	Area Type	other
Jurisdiction	CARSON CITY	Analysis Year	2021	PHF	0.87
Urban Street	WILL	Analysis Year	2021 EXIST	Analysis Period	1> 7:00
Intersection	ROO	File Name	ROWILAME.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	27	329	21	212	656	108	36	286	48	117	210	33

Signal Information				
Cycle, s	120.0	Reference Phase	2	
Offset, s	0	Reference Point	End	
Uncoordinated	No	Simult. Gap E/W	On	
Force Mode	Fixed	Simult. Gap N/S	On	

Green	19.5	33.6	19.8	23.6	0.0	0.0		
Yellow	3.0	3.4	3.0	3.5	0.0	0.0		
Red	2.5	3.0	2.2	2.9	0.0	0.0		



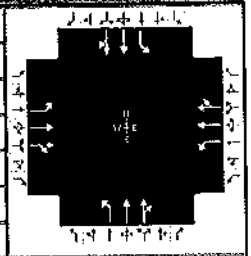
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	1	6	5	2	7	4	3	8
Case Number	1.1	4.0	1.1	4.0	1.1	4.0	1.1	4.0
Phase Duration, s	25.0	40.0	25.0	40.0	25.0	30.0	25.0	30.0
Change Period, (Y+R c), s	5.5	6.4	5.5	6.4	5.2	6.4	5.2	6.4
Max Allow Headway (MAH), s	3.3	0.0	3.3	0.0	3.3	3.2	3.3	3.2
Queue Clearance Time (gs), s	3.2		12.6		3.8	13.5	8.3	10.1
Green Extension Time (g e), s	0.0	0.0	0.3	0.0	0.0	1.1	0.2	1.2
Phase Call Probability	1.00		1.00		1.00	1.00	1.00	1.0
Max Out Probability	0.00		0.04		0.00	0.04	0.00	0.0

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	1	6	16	5	2	12	7	4	14	3	8	18
Adjusted Flow Rate (v), veh/h	31	203	200	244	450	428	41	195	189	134	141	138
Adjusted Saturation Flow Rate (s), veh/h/ln	1781	1870	1831	1781	1870	1778	1781	1870	1777	1781	1870	1782
Queue Service Time s s	1.2	10.5	10.6	10.6	27.4	27.4	1.8	11.2	11.5	6.3	7.9	8.1
Cycle Queue Clearance Time (g c), s	1.2	10.5	10.6	10.6	27.4	27.4	1.8	11.2	11.5	6.3	7.9	8.1
Green Ratio (g/C)	0.44	0.28	0.28	0.44	0.28	0.28	0.36	0.20	0.20	0.36	0.20	0.20
Capacity (c), veh/h	372	524	513	522	524	498	478	368	349	438	368	351
Volume-to-Capacity Ratio (X)	0.084	0.387	0.390	0.467	0.860	0.860	0.087	0.530	0.540	0.307	0.384	0.394
Back of Queue ft/ln 50 th percentile	13.9	131	127.5	124.8	382.6	360.6	21.2	147.4	141.6	74.3	101.4	98.1
Back of Queue (Q), veh/ln (50 th percenti	0.5	5.2	5.1	4.9	15.1	14.4	0.8	5.8	5.7	2.9	4.0	3.9
Queue Storage Ratio (RQ) (50 th per ent	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d 1), s/veh	22.8	34.9	34.9	22.5	41.0	41.0	25.5	43.2	43.3	27.3	41.9	42.0
Incremental Delay (d 2), s/veh	0.4	2.2	2.2	3.0	16.6	17.4	0.4	5.4	5.9	1.8	3.0	3.3
Initial Queue Delay (d 3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	23.2	37.0	37.1	25.5	57.6	58.4	25.8	48.6	49.2	29.1	44.9	45.3
Level of Service (LOS)	C	D	D	C	E	E	C	D	D	C	D	D
Approach Delay, s/veh / LOS	36.1	D		50.9	D		46.7	D		39.9	D	
Intersection Delay, s/veh / LOS	45.6						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.30	B	2.30	B	2.30	B	2.30	B
Bicycle LOS Score / LOS	0.85	A	1.41	A	0.84	A	0.83	A

HCS7 Signalized Intersection Results Summary

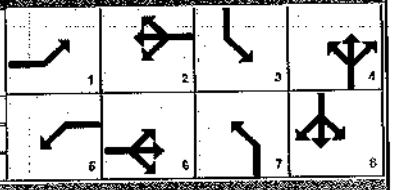
General Information				Intersection Information	
Agency	LOCHSA			Duration, h	0.250
Analyst	TIE	Analysis Date	12/7/2021	Area Type	Other
Jurisdiction	CARSON CITY	Time Period	PM	PHF	0.87
Urban Street	WILLIAMS STREET	Analysis Year	2021 EXIST	Analysis Period	1> 7:00
ntersection	R(ROOP STREET AT WIL...	File Name	ROWILPME.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	94	590	43	143	566	74	69	426	68	199	414	30

Signal Information			
Cycle,	120.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

	EB			WB			NB			SB		
Green	19.5	33.6		19.8	23.6	0.0	0.0					
Yellow	3.0	3.4		3.0	3.5	0.0	0.0					
Red	2.5	3.0		2.2	2.9	0.0	0.0					



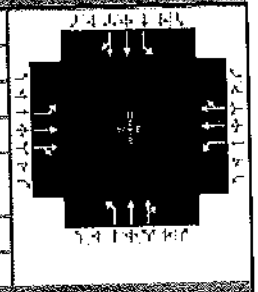
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
nedPhase								8
Case Number								4.0
Phase Duration, s							25.0	30.0
Change Period, (Y+R c), s		6.4					5.2	6.4
Max Allow Headway (MAH), s		0.0					3.3	3.2
Queue Clearance Time (gs), s							13.3	17.5
Green Extension Time (g e), s		0.0					0.3	1.5
Phase Call Probability							1.00	1.00
Max Out Probability	0.00		0.00		0.00	0.84	0.05	0.41

Movement Group Results	EB			WB			NB			SB		
Approach	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	1	6	16	5	2	12	7	4	14	3	8	R
Adjusted Flow Rate (v), veh/h	108	368	360	164	375	361	79	290	278	229	258	18
Adjusted Saturation Flow Rate (s), veh/h/ln	1781	1870	1825	1781	1870	1794	1781	1870	1780	1781	1870	253
Queue Service Time (gs), s	4.3	21.2	21.2	6.8	21.7	21.7	3.6	17.7	17.8	11.3	15.4	15.5
Cycle Queue Clearance Time (g c), s	4.3	21.2	21.2	6.8	21.7	21.7	3.6	17.7	17.8	11.3	15.4	15.5
Green Ratio (g/C)	0.44	0.28	0.28	0.44	0.28	0.28	0.36	0.20	0.20	0.36	0.20	0.20
Capacity (c), veh/h	409	524	511	412	524	502	399	368	350	380	368	359
Volume-to-Capacity Ratio (X)	0.264	0.703	0.704	0.398	0.716	0.718	0.199	0.788	0.794	0.601	0.700	0.704
Back of Queue (Q), ft/ln (90 th percentile)	91.6	383.9	371.3	139.6	392.9	375.7	76.3	352.5	338.4	219.4	303.9	295.7
Back of Queue (Q), veh/ln (90 th percentile)	3.6	15.1	14.9	5.5	15.5	15.0	3.0	13.9	13.5	8.6	12.0	11.8
Queue Storage Ratio (RQ) (90 th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d 1), s/veh	22.6	38.7	38.7	23.4	38.9	38.9	27.0	45.8	45.9	30.2	44.9	44.9
Incremental Delay (d 2), s/veh	1.6	7.7	7.9	2.9	8.1	8.5	1.1	15.6	16.8	6.9	10.6	11.0
Initial Queue Delay (d 3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	24.2	46.4	46.6	26.3	47.1	47.5	28.1	61.4	62.7	37.0	55.5	56.0
Level of Service (LOS)	C	D	D	C	D	D	C	E	E	D	F	56.0
Approach Delay, s/veh / LOS	43.6		D	43.4		D	57.9		E	49.9		E
Intersection Delay, s/veh / LOS	48.0						D					D

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score/ LOS	2.30	B	2.30	B	2.30	B	2.30	B
Bicycle LOS Score / LOS	1.18	A	1.23	A	1.02	A	1.10	A

HCS7 Signalized Intersection Results Summary

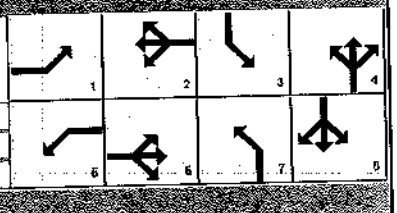
General Information				Intersection Information	
Agency	LOCHSA			Duration, h	0.250
Analyst	TTE	Analysis Date	12/7/2021	Area Type	Other
Jurisdiction	CARSON CITY	Time Period	AM	PHF	0.87
Urban Street	WILLIAMS STREET	Analysis Year	2022 BACKGROUND	Analysis Period	1> 7:00
Intersection	RO ROOP STREET AT WIL...	File Name	ROWILAMB.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	27	331	21	213	660	109	36	288	48	118	211	33

Signal Information			
Cycle, s	120.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	19.5	33.6	19.8	23.6	0.0	0.0						
Yellow	3.0	3.4	3.0	3.5	0.0	0.0						
Red	2.5	3.0	2.2	2.9	0.0	0.0						



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	1	6	5	2	7	4	3	8
Case Number	1.1	4.0	1.1	4.0	1.1	4.0	1.1	8
Phase Duration, s	25.0	40.0	25.0	40.0	25.0	30.0	25.0	4.0
Change Period, (Y+R c), s	5.5	6.4	5.5	6.4	5.2	6.4	5.2	30.0
Max Allow Headway (MAH), s	3.3	0.0	3.3	0.0	5.2			6.4
Queue Clearance Time (gs), s	3.2		12.7	0.0	3.3	3.2	3.3	3.2
Green Extension Time (g e), s	0.0	0.0	0.3	0.0	3.8	13.5	8.3	10.1
Phase Call Probability	1.00		1.00	0.0	0.	1.1	0.2	1.2
Max Out Probability	0.00		0.05		0.00	1.00		1.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	1	6	16	5	2	12	7	4	14	3	8	18
Adjusted Flow Rate (v), veh/h	31	204	201	245	453	431	41	196	190	136	142	139
Adjusted Saturation Flow Rate (s), veh/h/ln	1781	1870	1831	1781	1870	1777	1781	1870	1777	1781	1870	1783
Queue Service Time (gs), s	1.2	10.6	10.6	10.7	27.6	27.6	1.8	11.3	11.5	6.3	7.9	8.1
Cycle Queue Clearance Time (g c), s	1.2	10.6	10.6	10.7	27.6	27.6	1.8	11.3	11.5	6.3	7.9	8.1
Green Ratio (g/C)	0.44	0.28	0.28	0.44	0.28	0.28	0.36	0.20	0.20	0.36	0.20	0.20
Capacity (c), veh/h	370	524	513	521	524	498	477	368	350	438	368	351
Volume-to-Capacity Ratio (X)	0.084	0.389	0.392	0.470	0.865	0.866	0.087	0.534	0.543	0.310	0.386	0.395
Back of Queue (Q), ft/ln (50 th percentile)	13.9	131.8	128.2	125.7	387.4	365.1	21.2	148.3	142.5	75.1	101.9	98.6
Back of Queue (Q), veh/ln (50 th percentile)	0.5	5.2	5.1	4.9	15.3	14.6	0.8	5.8	5.7	3.0	4.0	3.9
Queue Storage Ratio (RQ) (50 th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d 1), s/veh	22.8	34.9	34.9	22.5	41.0	41.1	25.5	43.3	43.4	27.3	41.9	42.0
Incremental Delay (d 2), s/veh	0.4	2.2	2.2	3.0	17.2	18.0	0.4	5.5	6.0	1.8	3.0	3.3
Initial Queue Delay (d 3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	23.3	37.1	37.2	25.5	58.2	59.0	25.8	48.7	49.3	29.2	44.9	45.3
Level of Service (LOS)	C	D	D	C	E	E	C	D	D	C	D	D
Approach Delay, s/veh / LOS	36.1	D		51.4	D		46.8	D		39.9	D	
Intersection Delay, s/veh / LOS	45.9						D					

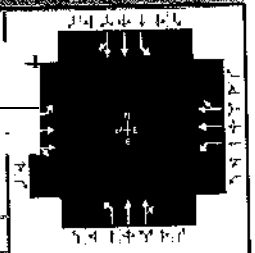
Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.30	B	2.30	B	2.30	B	2.30	B
Bicycle LOS Score / LOS	0.85	A	1.42	A	0.84	A	0.83	A

HCS7 Signalized Intersection Results Summary

General Information

Agency	LOCHSA			Duration, h	0.250
Analyst	TTE	Analysis Date	1/1/2021	Area Type	Other
Jurisdiction	CARSON CITY	Time Period	PM	PHF	0.87
Urban Street	WILLIAMS STREET	Analysis Year	2022 BACKGROUND	Analysis Period	1> 7:00
Intersection	ROOP STREET AT WIL...	File Name	ROWILPMB.xus		
Project Description					

Intersection Information

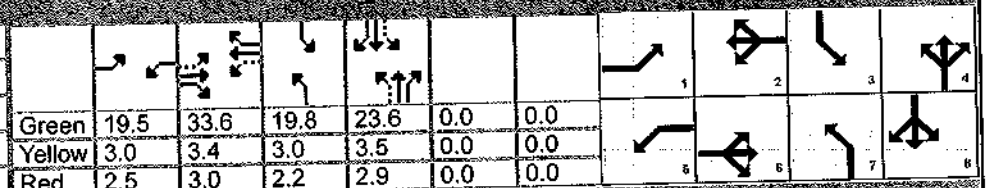


Demand Information

Approach Movement	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v , veh/h	95	594	43	144	569	74	69	429	68	200	416	30

Signal Information

Cycle, s	120.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	19.5	33.6	19.8	23.6	0.0	0.0						
Yellow	3.0	3.4	3.0	3.5	0.0	0.0						
Red	2.5	3.0	2.2	2.9	0.0	0.0						

Timer Results

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	1	6	5	2	7	4	3	8
Case Number	1.1	4.0	1.1	4.0	1.1	4.0	1.1	4.0
Phase Duration, s	25.0	40.0	25.0	40.0	25.0	30.0	25.0	30.0
Change Period, ($Y+R_c$), s	5.5	6.4	5.5	6.4	5.2	6.4	5.2	6.4
Max Allow Headway (MAH), s	3.3	0.0	3.3	0.0	3.3	3.2	3.3	3.2
Queue Clearance Time (g_s), s	6.4		8.9		5.6	20.0	13.4	17.6
Green Extension Time (g_e), s	0.1	0.0	0.2	0.0	0.1	1.1	0.1	1.5
Phase Call Probability	1.00		1.00		1.00	1.00	1.00	1.00
Max Out Probability	0.00		0.00		0.00	0.87	0.06	0.42

Movement Group Results

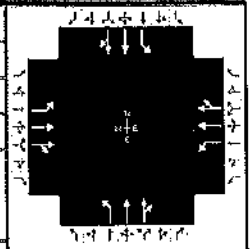
Approach Movement	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	1	6	16	5	2	12	7	4	14	3	8	18
Adjusted Flow Rate (v), veh/h	109	370	362	166	377	362	79	291	280	230	259	258
Adjusted Saturation Flow Rate (s), veh/h/ln	1781	1870	1825	1781	1870	1795	1781	1870	1781	1781	1870	1826
Queue Service Time (gs), s	4.4	21.3	21.4	6.9	21.8	21.9	3.6	17.8	18.0	11.4	15.5	15.6
Cycle Queue Clearance Time (g_c), s	4.4	21.3	21.4	6.9	21.8	21.9	3.6	17.8	18.0	11.4	15.5	15.6
Green Ratio (g/C)	0.44	0.28	0.28	0.44	0.28	0.28	0.36	0.20	0.20	0.36	0.20	0.20
Capacity (c), veh/h	408	524	511	411	524	502	399	368	350	379	368	359
Volume-to-Capacity Ratio (X)	0.268	0.707	0.708	0.403	0.719	0.721	0.199	0.792	0.799	0.606	0.703	0.707
Back of Queue (Q), ft/ln (90 th percentile)	92.8	386.7	374.1	140.5	395.1	377.9	76.3	355.4	341.2	220.8	305.6	297.3
Back of Queue (Q), veh/ln (90 th percentile)	3.7	15.2	15.0	5.5	15.6	15.1	3.0	14.0	13.6	8.7	12.0	11.9
Queue Storage Ratio (RQ) (90 th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d_1), s/veh	22.7	38.8	38.8	23.5	38.9	39.0	27.0	45.9	45.9	30.2	44.9	44.9
Incremental Delay (d_2), s/veh	1.6	7.8	8.0	2.9	8.3	8.7	1.1	16.0	17.2	7.0	10.7	11.2
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	24.3	46.6	46.8	26.4	47.2	47.6	28.1	61.8	63.1	37.2	55.7	56.1
Level of Service (LOS)	C	D	D	C	D	D	C	E	E	D	E	E
Approach Delay, s/veh / LOS	43.8	D		43.6	D		58.3	E		50.1	D	
Intersection Delay, s/veh / LOS	48.2						D					

Multimodal Results

	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.30	B	2.30	B	2.30	B	2.30	B
Bicycle LOS Score / LOS	1.18	A	1.23	A	1.02	A	1.10	A

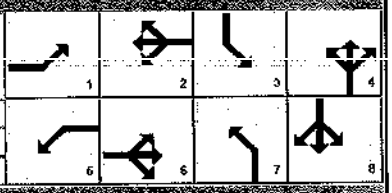
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	LOCHSA			Duration, h	0.250
Analyst	TTE	Analysis Date	12/7/2021	Area Type	Other
Jurisdiction	CARSON CITY	Time Period	AM	PHF	0.87
Urban Street	WILLIAMS STREET	Analysis Year	2022 BACKGROUND WPROJ	Analysis Period	1> 7:00
Intersection	RROOP STREET AT WIL...	File Name	ROWILAMP.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	34	353	21	213	668	109	36	288	48	118	211	35

Signal Information													
Cycle, s	12 20.0	Reference Phase	2										
Offset, s	0	Reference Point	End										
Uncoordinated	No	Simult. Gap E/W	On	Green	19.5	33.6	19.8	23.6	0.0	0.0			
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	3.0	3.4	3.0	3.5	0.0	0.0			
				Red	2.5	3.0	2.2	2.9	0.0	0.0			



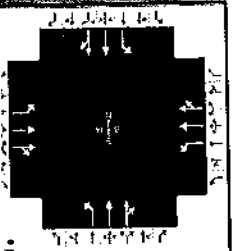
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	1	6	5	2	7	4	3	8
Case Number	1.1	4.0	1.1	4.0	1.1	4.0	1.1	4.0
Phase Duration, s	25.0	40.0	25.0	40.0	25.0	30.0	25.0	30.0
Change Period, (Y+R c), s	5.5	6.4	5.5	6.4	5.2	6.4	5.2	6.4
Max Allow Headway (MAH), s	3.3	0.0	3.3	0.0	3.3	3.2	3.3	3.2
Queue Clearance Time (gs), s	3.5		12.7		3.8	13.5	8.3	10.2
Green Extension Time (e), s	0.0	0.0	0.3	0.0	0.0	1.1	0.2	1.2
Phase Call Probability	1.00		1.00		1.00	1.00	1.00	1.00
Max Out Probability	0.00		0.05		0.00	0.04	0.00	0.01

Movement Group Results	EB			WB			NB			SB		
Approach Movement				L	T	R	L	T	R	L	T	R
Assigned Movement				5	2	12	7	4	14	3	8	18
Adjusted Flow Rate (v), veh/h					458	435	41	196	190	136	143	140
Adju Saturation Flow Rate (s), veh/h/ln					1870	1778	1781	1870	1777	1781	1870	1778
Queue Service Time (gs), s	1.5	11.3	11.4	10.7	28.0	28.0	1.8	11.3	11.5	6.3	8.0	8.2
Queue Clearance Time (g c), s	1.5	11.3	11.4	10.7	28.0	28.0	1.8	11.3	11.5	6.3	8.0	8.2
Green Ratio (g/C)	0.44	0.28	0.28	0.44	0.28	0.28	0.36	0.20	0.20	0.36	0.20	0.20
Capacity (c), veh/h												350
Volume-to-Capacity Ratio (X)	0.106	0.413	0.416	0.479	0.874	0.874	0.087	0.534	0.543	0.310	0.389	0.399
Back of Queue (Q), ft/ln (50 th percentile)	17.6	141.4	137.6	126.1	395	372.4	21.2	148.3	142.5	75.1	102.9	99.4
Back of Queue (Q), veh/ln (50 th ercentile)	0.7	5.6	5.5	5.0	15.5	14.9	0.8	5.8	5.7	3.0	4.0	4.0
5)ueue Storage Ratio (RQ) (50 th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform d1 s/veh	23.1	35.2	35.2	22.6	41.2	41.2	25.5	43.3	43.4	27.3	41.9	42.0
Incremental Delay (d 2), s/veh	0.6	2.4	2.5	3.2	18.1	18.9	0.4	5.5	6.0	1.8	3.1	3.4
Initial Queue Delay (d 3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	23.7	37.6			59.3						45.0	45.4
Level of Service (LOS)	C	D			E						D	D
Approach Delay, s/veh / LOS	36.5			52.4						40.0		D
Intersection Delay, s/veh / LOS	46.2									D		

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score/ LOS	2.30	B	2.30	B	2.30	B	2.30	B
Bicycle LOS Score / LOS	0.87	A	1.43	A	0.84	A	0.83	A

HCS7 Signalized Intersection Results Summary

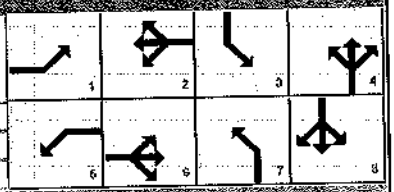
General Information				Intersection Information	
Agency	LOCHSA			Duration, h	0.250
Analyst	TTE	Analysis Date	12/7/2021	Area Type	Other
Jurisdiction	CARSON CITY	Time Period	PM	PHF	0.87
Urban Street	WILLIAMS STREET	Analysis Year	2022 BACKGROUND WPROJ	Analysis Period	1> 7:00
Intersection	RCROOP STREET AT WIL...	File Name	ROWILLPMP.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	99	609	43	144	593	74	69	429	68	200	416	37

Signal Information			
Cycle, s	120.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	19.5	33.6	19.8	23.6	0.0	0.0	
Yellow	3.0	3.4	3.0	3.5	0.0	0.0	
Red	2.5	3.0	2.2	2.9	0.0	0.0	



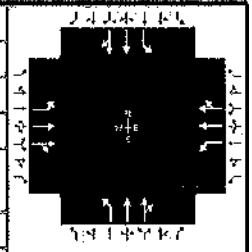
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	1	6	5	2	7	4	3	8
Case Number	1.1	4.0	1.1	4.0	1.1	4.0		
Phase Duration, s	25.0	40.0	25.0	40.0	25.0	30.0		30.0
Change Period, ($Y+R_c$), s	5.5	6.4	5.5	6.4	5.2	6.4		6.4
Max Allow Headway (MAH), s	3.3	0.0	3.3	0.0	3.			3.2
Queue Clearance Time (gs), s	6.6		8.9		5.6	20.0	13.4	17.9
Green Extension Time (g_e), s	0.1	0.0	0.2	0.0	0.1	1.1	0.3	1.5
Phase Call Probability	1.00		1.00		1.00	1.00	1.00	1.00
Max Out Probability	0.00		0.00		0.00	0.88	0.06	0.

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	1	6	16	5	2	12	7	4	14	3	8	18
Adjusted Flow Rate (v), veh/h	114	379	370	166	391	376	79	291	280	230	263	257
Adjusted Saturation Flow Rate (s), veh/h/ln	1781	1870	1827	1781	1870	1797	1781	1870	1781	1781	1870	1816
Queue Service Time (gs), s	4.6	22.0	22.0	6.9	22.8	22.9	3.6	17.8	18.0	11.4	15.8	15.9
Cycle Queue Clearance Time (g_c), s	4.6	22.0	22.0	6.9	22.8	22.9	3.6	17.8	18.0	11.4	15.8	15.9
Green Ratio (g/C)	0.44	0.28	0.28	0.44	0.28	0.28	0.36	0.20	0.20	0.36	0.20	0.20
Capacity (c), veh/h	401	524	511	407	524	503	396	368	350	379	368	357
Volume-to-Capacity Ratio (X)	0.284	0.724	0.724	0.407	0.746	0.747	0.200	0.792	0.799	0.606	0.	0.720
Back of Queue (Q), ft/ln (90 th percentile)	97.3	398.2	385.3	140.7	413.9	396.1	76.3	355.4	341.2	220.8	312.1	302.9
ack of Queue (Q), veh/ln (90 th percent	3.8	15.7	15.4	5.5	16.3	15.8	3.0	14.0	13.6	8.7	12.3	
Queue Storage Ratio (RQ) (90 th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d_1), s/veh	23.0	39.0	39.0	23.7	39.3	39.3	27.1	45.9	45.9	30.2	45.1	45.1
Incremental Delay (d_2), s/veh	1.8	8.4	8.6	3.0	9.3	9.7	1.1	16.0	17.2	7.0	11.3	11.9
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	24.8	47.4	47.7	26.7	48.6	49.1	28.2	61.8	63.1	37.2	56.4	57.0
Level of Service (LOS)	C	D	D	C	D	D	C	E	E	D	E	E
Approach Delay, s/veh / LOS	44.5	D		44.9	D		58.3	E		50.7	D	
Intersection Delay, s/veh / LOS	48.9						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.30	B	2.30	B	2.30	B	2.30	
Bicycle LOS Score / LOS	1.20	A	1.26	A	1.02	A	1.11	A

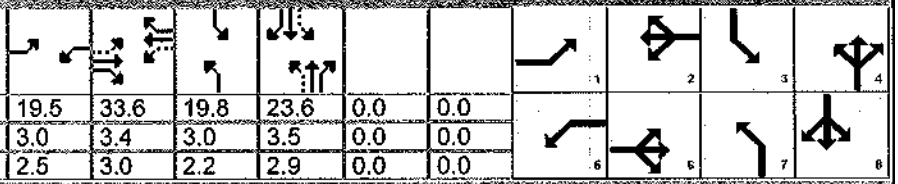
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
A	LOCHSA			Duration, h	0.250
Analyst.	TTE	Analysis Date	12/7/2021	Area Type	Other
Jurisdiction	CARSON CITY	Time Period	AM	PHF	0.87
Urban Street	WILLIAMS STREET	Analysis Year	2050 BACKGROUND	Analysis Period	1> 7:00
Intersection	ROOP STREET AT WIL...	File Name	ROWILAM50B.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	32	393	25	253	784	129	43	342	57	140	251	39

Signal Information			
Cycle, s	120.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



	EB		WB		NB		SB	
Green	19.5	33.6	19.8	23.6	0.0	0.0		
Yellow	3.0	3.4	3.0	3.5	0.0	0.0		
Red	2.5	3.0	2.2	2.9	0.0	0.0		

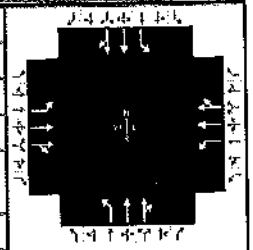
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	1	6	5	2	7	4	3	8
Case Number	1.1	4.0	1.1	4.0	1.1	4.0	1.1	4.0
Phase Duration, s			25.0					30.0
Change Period, (Y+R c), s			5.5					6.4
- ax Allow Headway (MAf:1), s			3.3					3.2
9ueue Clearance Time (gs), s			15.1					11.8
Green Extension Time e s			0.3					1.4
Phase Call Probability			1.00					1.00
Max Out Probability	0.00		0.39		0.00	0.16	0.00	0.03

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement											8	18
AdJ:I Rate (v), veh/h											169	164
A usted Saturation Flow Rate (s), v											1870	1783
Queue Service Time s), s											9.6	9.8
Cv uE: Clearance Time (g c), s											9.6	9.8
Green Ratio												0.20
ity C), veh/h												351
volume-to-Capacity Ratio (X)												0.469
Back of Queue (Q), ft/ln (50 th percentile)											124.3	120
Back of Queue (Q), veh/ln (50 th percentile)											4.9	4.8
_9ueueStorage Ratio (RQ)i 50 th percentile)											0.00	0.00
Uniform d1 s/veh											42.6	42.7
_Inc emental Delay (d 2), s/veh											4.1	4.4
Initial Queue Delay (d 3), s/veh											0.0	0.0
Control Delay (d s/veh												47.1
Level of Service (LOS)											D	D
Approach Delay, s/veh / LOS	37.7	D		76.9	E		50.2	D		41.7	D	
Intersection Delay, s/veh / LOS	59.0						E					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.30	B	2.30	B	2.30	B	2.30	B
Bicycle LOS Score / LOS	0.91	A	1.59	B	0.91	A	0.90	A

HCS7 Signalized Intersection Results Summary

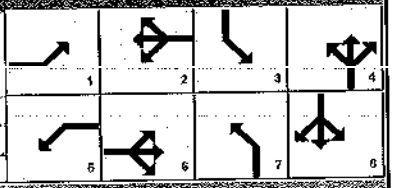
General Information				Intersection Information	
Agency	LOCHSA			Duration, h	0.250
Analyst	TTE	Analysis Date	12/7/2021	Area Type	Other
Jurisdiction	CARSON CITY	Time Period	PM	PHF	0.87
Urban Street	WILLIAMS STREET	Analysis Year	2050 BACKGROUND	Analysis Period	1> 7:00
Intersection	ROOP STREET AT WIL...	File Name	ROWILPM50B.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	112	705	51	171	676	88	82	509	81	238	495	36

Signal Information				
Cycle, s	120.0	Reference Phase	2	
Offset, s	0	Reference Point	End	
Uncoordinated	No	Simult. Gap E/W	On	
Force Mode	Fixed	Simult. Gap N/S	On	

Green	19.5	33.6		19.8	23.6		0.0	0.0				
Yellow	3.0	3.4		3.0	3.5		0.0	0.0				
Red	2.5	3.0		2.2	2.9		0.0	0.0				



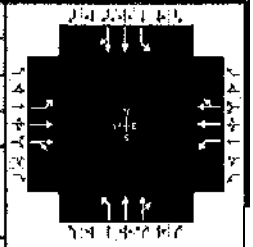
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	1	6	5	2	7	4	3	8
Case Number	1.1	4.0	1.1	4.0	1.1	4.0	1.1	4.0
Phase Duration, s	25.0	40.0	25.0	40.0	25.0	30.0	25.0	30.0
Change Period, (Y+R c), s	5.5	6.4	5.5	6.4	5.2	6.4	5.2	6.4
Max Allow Headway (MAH), s	3.3	0.0	3.3	0.0	3.3	3.2	3.3	3.2
Queue Clearance Time (gs), s	7.2		10.3		6.3	24.1	15.9	21.1
Green Extension Time (g e), s	0.2	0.0	0.3	0.0	0.1	0.0	0.2	1.0
Phase Call Probability	1.00		1.00		1.00	1.00	1.00	1.00
Max Out Probability	0.00		0.00		0.00	1.00	0.59	1.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	1	6	16	5	2	12	7	4	14	3	8	18
Adjusted Flow Rate (v), veh/h	129	440	429	197	448	430	94	347	331	274	308	302
Adjusted Saturation Flow Rate (s), veh/h/ln	1781	1870	1825	1781	1870	1794	1781	1870	1780	1781	1870	1825
Queue Service Time (gs), s	5.2	26.6	26.6	8.3	27.2	27.2	4.3	21.9	22.1	13.9	19.0	19.1
Cycle Queue Clearance Time (g c), s	5.2	26.6	26.6	8.3	27.2	27.2	4.3	21.9	22.1	13.9	19.0	19.1
Green Ratio (g/C)	0.44	0.28	0.28	0.44	0.28	0.28	0.36	0.20	0.20	0.36	0.20	0.20
Capacity (c), veh/h	372	524	511	376	524	502	371	368	350	354	368	359
Volume-to-Capacity Ratio (X)	0.346	0.840	0.840	0.522	0.856	0.856	0.254	0.943	0.947	0.773	0.838	0.841
Back of Queue (Q), ft/ln (90 th percentile)	156.6	490.1	473.7	232	504.8	482.1	92.4	470.5	450.6	279.4	385.3	374.5
Back of Queue (Q), veh/ln (90 th percentile)	6.2	19.3	18.9	9.1	19.9	19.3	3.6	18.5	18.0	11.0	15.2	15.0
Queue Storage Ratio (RQ) (90 th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d 1), s/veh	24.4	40.7	40.7	25.3	40.9	40.9	27.9	47.5	47.6	31.2	46.4	46.4
Incremental Delay (d 2), s/veh	2.5	14.9	15.2	5.1	16.3	16.9	1.6	34.4	36.3	15.1	19.9	20.6
Initial Queue Delay (d 3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	26.9	55.6	55.9	30.4	57.2	57.8	29.6	82.0	83.9	46.3	66.3	67.0
Level of Service (LOS)	C	E	E	C	E	E	C	F	F	D	E	E
Approach Delay, s/veh / LOS	52.0	D		52.5	D		76.4	E		60.3	E	
Intersection Delay, s/veh / LOS	59.2						E					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.30	B	2.30	B	2.30	B	2.30	B
Bicycle LOS Score/ LOS	1.31	A	1.37	A	1.12	A	1.22	A

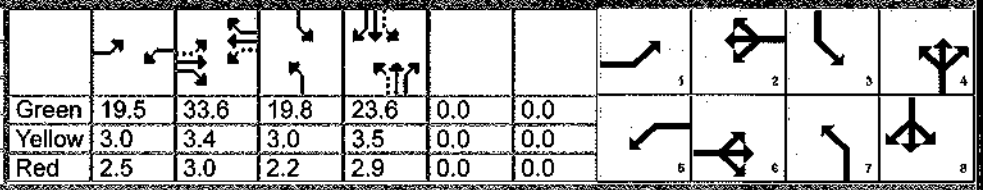
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	LOCHSA			Duration, h	0.250
Analyst	TTE	Analysis Date	12/7/2021	Area Type	Other
Jurisdiction	CARSON CITY	Time Period	AM	PHF	0.87
Urban Street	WILLIAMS STREET	Analysis Year	2050 BACKGROUND WPROJ	Analysis Period	1> 7:00
Intersection	ROOP STREET AT WIL...	File Name	ROWILAM50P.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	39	416	25	253	792	129	43	342	57	140	251	41

Signal Information			
Cycle, s	120.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



	Green	Yellow	Red
1	19.5	3.0	2.5
2	33.6	3.4	3.0
3	19.8	3.0	2.2
4	23.6	3.5	2.9
5	0.0	0.0	0.0
6	0.0	0.0	0.0

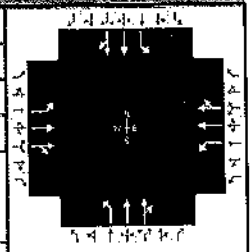
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	1	6	5	2	7			8
Case Number	1.1	4.0	1.1	4.0	1.1			4.0
Phase Duration, s	25.0	40.0	25.0	40.0	25.0			30.0
Change Period, (Y+R c), s	5.5	6.4	5.5	6.4	5.2			6.4
Max Allow Headway (MAH), s	3.3	0.0	3.3	0.0	3.3			3.2
Queue Clearance Time (s), s	3.7		15.1		4.2			11.9
Green Extension Time (g e), s	0.0	0.0	0.3	0.0	0.0	1.2	0.2	1.4
Phase Call Probability	1.00		1.00		1.00	1.00	1.00	1.00
Max Out Probability	0.00		0.39		0.00	0.16	0.00	0.03

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L			L	T	R	L	T	R	L	T	R
Assigned Movement	1	6		5	2	12	7	4	14	3	8	18
Adjusted Flow Rate (v), veh/h	45	255			543	516	49	234	225	161	170	165
Adjusted Saturation Flow Rate (s), veh/h/ln			1833	1781				1870	1777	1781	1870	1779
Queue Service Time (gs), s			13.7	13.1				13.8			9.7	9.9
Cycle Queue Clearance Time (g c), s			13.7	13.1				13.8			9.7	9.9
Green Ratio (g/C)								0.20			0.20	0.20
Capacity (c), veh/h								368				350
Volume-to-Capacity Ratio (X)								0.635				0.473
Back of Queue (Q), ft/ln (50 th percentile)								184.4				120.8
Back of Queue (Q), veh/ln (50 th percentile)								7.3				4.8
Queue Storage Ratio (RQ) (50 th percentile)								0.00				0.00
Uniform Delay (d 1), s/veh								44.2	44.3	28.2	42.6	42.7
Incremental Delay (d 2), s/veh								8.1	8.8	2.8	4.1	4.5
Initial Queue Delay (d 3), s/veh								0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh								52.4	53.2	30.9	46.7	47.2
Level of Service (LOS)								D	D		D	D
Approach Delay, s/veh / LOS									D			D
Intersection Delay, s/veh / LOS	59.8						E					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.30	B	2.30	B	2.30	B	2.30	B
Bicycle LOS Score / LOS	0.94	A	1.60	B	0.91	A	0.90	A

HCS7 Signalized Intersection Results Summary

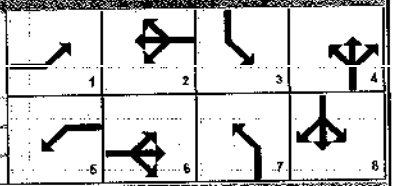
General Information				Intersection Information	
Agency	LOCHSA			Duration, h	0.250
Analyst	TTE	Analysis Date	12/7/2021	Area Type	Other
Jurisdiction	CARSON CITY	ime Period	PM	PHF	0.87
Urban Street	WILLIAMS STREET	Analysis Year	2050 BACKGROUND WPROJ	Analysis Period	1> 7:00
ntersection	R(ROOP STREET AT WIL...	File Name	ROWILPM50P.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	116	720	51	171	700	88	82	509	81	238	495	43

Signal Information				
Cycle, s	1: 120.0	Reference Phase	2	
Offset, s	0	Reference Point	End	
Uncoordinated	I No	Simult. Gap E/W	On	
Force Mode	Fixed	S Simult. Gap N/S	On	

Green	19.5	33.6		19.8	23.6	0.0	0.0					
Yellow	3.0	3.4		3.0	3.5	0.0	0.0					
Red	2.5	3.0		2.2	2.9	0.0	0.0					



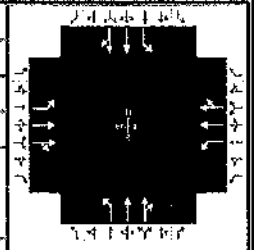
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	1	6	5	2	7	4	3	8
Case Number	1.1	4.0	1.1	4.0	1.1	4.0	1.1	4.0
Phase Duration, s	25.0	40.0	25.0	40.0	25.0	30.0	25.0	30.0
Change Period, (Y+R c), s	5.5	6.4	5.5	6.4	5.2	6.4	5.2	6.4
Max Allow Headway (MAH), s	3.3	0.0	3.3	0.0	3.3	3.2	3.3	3.2
Queue Clearance Time s), s	7.4		10.3		6.3	2	24.1	21.5
Green Ex_tension Time (g e), s	0.2	0.0	0.3	0.0	0.1	(	0.0	0.9
Phase Call Probability	1.00		1.00		1.00	1	1.00	1.00
Max Out Probability	0.00		0.00		0.00	1.00	0.59	1.00

Movement Group Results	EB			WB			NB			SB		
Approach -e_m_e_nt	L	T	R	L	T	R	L	T	R	L	T	R
2igned Movement	1	6	16	5	2	12	7	4	14	3	8	18
- usted Flow Rate (v), veh/h	133	448	438	197	462	444	94	347	331	274	313	305
Adjusted Saturation Flow Rate (s), veh/h/ln	1781	1870	1826	1781	1870	1797	1781	1870	1780	1781	1870	1817
Queue Service Time (gs), s	5.4	27.2	27.2	8.3	28.3	28.3	4.3	21.9	22.1	13.9	19.4	19.5
Cycle Queue Clearance Time (g c), s	5.4	27.2	27.2	8.3	28.3	28.3	4.3	21.9	22.1	13.9	19.4	19.5
Green Ratio (g/C)	0.44	0.28	0.28	0.44	0.28	0.28	0.36	0.20	0.20	0.36	0.20	0.20
Capacity (c veh/h	366	524	511	372	524	503	368	368	350	354	368	357
Volume-to-Capacity Ratio (X)	0.364	0.856	0.856	0.528	0.882	0.882	0.256	0.943	0.947	0.773	0.851	0.854
Back of Queue (Q), ft/In (90 th percentile)	162.5	505.6	488.8	232.9	531.5	507.6	92.5	470.5	450.6	279.4	394.2	382.3
Back of Queue (Q), veh/ln (90 th percentile)	6.4	19.9	19.6	9.2	20.9	20.3	3.6	18.5	18.0	11.0	15.5	15.3
Queue Storage Rat!2_S) (90 th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d 1), s/veh	24.7	40.9	40.9	25.4	41.3	41.3	28.0	47.5	47.6	31.2	46.5	46.5
-- nc emental Delay (d 2), s/veh	2.8	16.3	16.7	5.3	18.9	19.6	1.7	34.4	36.3	15.1	21.2	22.1
Initial Queue Delay (d 3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	27.4	57.2	57.6	30.7	60.2	60.9	29.6	82.0	83.9	46.3	67.7	68.6
-- evel of Service (LOS)	C	E	E	C	E	E	C	F	F	D	E	E
Approach Delay, s/veh / LOS	53.5	D		55.2	E		76.4	E		61.5	E	
Intersection Delay, s/veh / LOS	60.6						E					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.30	B	2.30	B	2.30	B	2.30	B
Bicycle LOS Score / LOS	1.33	A	1.40	A	1.12	A	1.22	A

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	LOCHSA			Duration, h	0.250
Analyst	TTE	Analysis Date	12/7/2021	Area Type	Other
Jurisdiction	CARSON CITY	Time Period	PM	PHF	0.87
Urban Street	WILLIAMS STREET	Analysis Year	2022	Analysis Period	1> 7:00
			BACKGROUND WPROJ		
Intersection	ROOP STREET AT WIL...	File Name	ROWILPMP.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	99	609	43	144	593	74	69	429	68	200	416	37

Signal Information														
Cycle, s	120.0	Reference Phase												
Offset, s	0	Reference Point												
Uncoordinated	No	Simult. Gap E/W												
Force Mode	Fixed	Simult. Gap N/S	On	Red	2.5	0.0	3.0	2.2	2.2	2.9	6	6	7	8

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	1	6	5	2	7	4	3	8
Case Number		4.0			1.1	4.0	1.1	4.0
Phase s		58.1			11.1	28.5	19.5	36.9
Change Period, ($Y+R_c$), s		6.4			5.2	6.4	5.2	6.4
Max Allow Headway *(MAH)*, s	3.3	0.0	3.3	0.0	3.3	3.2	3.3	3.2
Queue Clearance Time (gs), s	6.2		8.1		6.3	20.3	14.1	16.8
Green Extension Time (g_e), s	0.2		0.3	0.0			0.2	2.3
Phase Call Probability							1.00	1.00
Max Out Probability	0.00		0.00		0.00	0.18	0.11	0.01

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	1	6	16	5	2	12	7	4	14	3	8	18
Adjusted Flow Rate (*v*), veh/h	114	379	370	166	391	376	79	291	280	230	263	257
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1781	1870	1827	1781	1870	1797	1781	1870	1781	1781	1870	1816
Queue Service Time (gs), s	4.2	17.3	17.4	6.1	17.5	17.5	4.3	18.1	18.3	12.1	14.7	14.8
Cycle Queue Clearance Time (g_c), s	4.2	17.3	17.4	6.1	17.5	17.5	4.3	18.1	18.3	12.1	14.7	14.8
Green Ratio (*g/C*)	0.48	0.43	0.43	0.50	0.45	0.45	0.23	0.18	0.18	0.32	0.25	0.25
Capacity (*c*), veh/h	354	806	787	388	839	806	248	344	328	299	475	461
Volume-to-Capacity Ratio (X)	0.322	0.470	0.471	0.426	0.466	0.466	0.319	0.847	0.854	0.768	0.554	0.558
Back of Queue (Q), ft/ln (90 th percentile)	81.5	301	291	117.5	301.1	287.5	87.6	335.9	322.3	222.3	259.4	250.7
Back of Queue (Q), veh/ln (90 th percentile)	3.2	11.8	11.6	4.6	11.9	11.5	3.4	13.2	12.9	8.8	10.2	10.0
Queue Storage Ratio (RQ) (90 th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d_1), s/veh	18.6	24.4	24.4	18.1	23.1	23.1	37.2	47.3	47.4	34.0	38.9	38.9
Incremental Delay (d_2), s/veh	0.2	2.0	2.0	0.3	1.9	1.9	0.3	8.8	9.9	5.1	0.4	0.4
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (*d*), s/veh	18.8	26.3	26.4	18.4	24.9	25.0	37.5	56.1	57.2	39.2	39.2	39.3
Level of Service (LOS)	B	C	C	B	C	C	D	E	E	D	D	D
Approach Delay, s/veh / LOS	25.4	C		23.8	C		54.3	D		39.2	D	
Intersection Delay, s/veh / LOS	34.1						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.28	B	2.27	B	2.31	B	2.30	B
Bicycle LOS Score / LOS	1.20	A	1.26	A	1.02	A	1.11	A

APPENDIXD

Driveway Analysis

HCS7 Two-Way Stop-Control Report

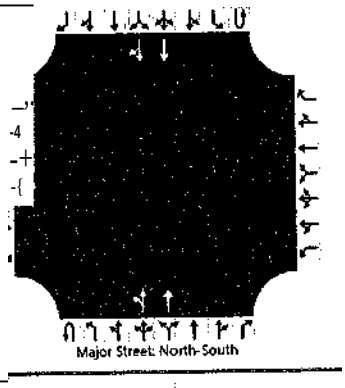
General Information

Analyst	TTE
Agency/Co.	LOCHSA
Date Performed	12/7/2021
Analysis Vear	2022
Time Analyzed	AM
Intersection Orientation	North-South
Project Description	

Site Information

Intersection	DRIVEWAY ON STEWART
Jurisdiction	CARSON CITY
East/West Street	DRIVEWAY
North/South Street	STEWART STREET
Peak Hour Factor	0.92
Ana_lysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	u	L	T	R	u	L	T	R	u	L	T	R	u	L	T	R
Priority		10	11	12		7	8	9	1U		2	3	4U	4	5	6
Number of Lanes		0		0		0	0	0	0	0	2	0	0	0	2	0
Configuration			LR							LT	T				T	TR
Volume (veh/h)		40		27						8	222				390	13
Percent Heavy Vehicles (%)		3		3						3						
Proportion Time Blocked																
Percent Grade (%)			0													
Right Turn Channelized																
Median Type I Storage				Undivided												

Critical and Follow-up Headways

, Base Critical Headway (sec)		7.5		6.9						4.1						
Critical Headway (sec)		6.86		6.96						4.16						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.53		3.33						2.23						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			73							9						
Capacity, c (veh/h)			539							1111						
v/c Ratio			0.14							0.01						
95% Queue Length, Qgs (veh)			0.5							0.0						
Control Delay (s/veh)			12.7							8.3						
Level of Service (LOS)			B							A						
Approach Delay (s/veh)		12.7								0.3						
Approach LOS		B														

HCS7 Two-Way Stop-Control Report

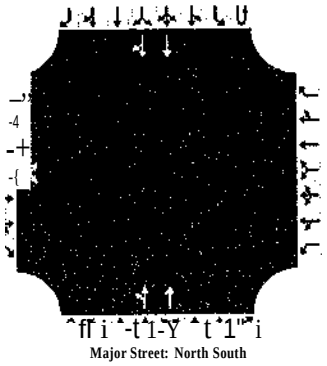
General Information

Analyst	TTE
Agency/Co.	LOCHSA
Date Performed	12/7/2021
Analysis Year	2022
Time Analyzed	PM
Intersection Orientation	North-South
Project Description	

Site Information

Intersection	DRIVEWAY ON STEWART
Jurisdiction	CARSON CITY
East/West Street	DRIVEWAY
North/South Street	STEWART STREET
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	u	L	T	R	u	L	T	R	u	L	T	R	u	L	T	R
Priority		10	11	12		7	8	9	1U		2	3	4U	4	5	6
Number of Lanes		0		0		0	0	0	0	0	2	0	0	0	2	0
Configuration			LR							LT	T				T	TR
Volume (veh/h)		25		16						28	470				243	41
Percent Heavy Vehicles (%)		3		3						3						
Proportion Time Blocked																
Percent Grade (%)		0														
Right Turn Channelized																
Median Type / Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.5		6.9						4.1						
Critical Headway (sec)		6.86		6.96						4.16						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.53		3.33						2.23						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		45								30						
Capacity, c (veh/h)		519								1241						
v/c Ratio		0.09								0.02						
95% Queue Length, Qgs (veh)		0.3								0.1						
Control Delay (s/veh)		12.6								8.0						
Level of Service (LOS)		B								A						
Approach Delay (s/veh)	12.6								0.6							
Approach LOS	B															

HCS7 Two-Way Stop-Control Report

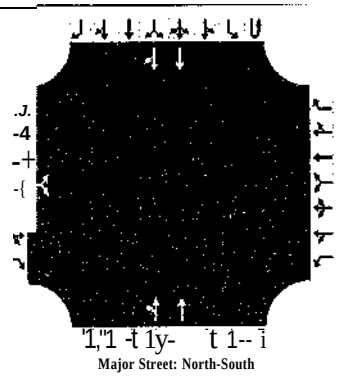
General Information

Analyst	TTE
Agency/Co.	LOCHSA
Date Performed	12/7/2021
Analysis Year	2050
Time Analyzed	AM
Intersection Orientation	North-South
Project Description	

Site Information

Intersection	DRIVEWAY ON STEWART
Jurisdiction	CARSON CITY
East/West Street	DRIVEWAY
North/South Street	STEWART STREET
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U		2	3	4U	4	5	6
Number of Lanes		0		0		0	0	0	0	0	2	0	0	0	2	0
Configuration			LR							LT	T				T	TR
Volume (veh/h)		40		27						8	264				463	13
Percent Heavy Vehicles (%)		3		3						3						
Proportion Time Blocked																
Percent Grade (%)		0														
Right Turn Channelized																
Median Type / Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.5		6.9						4.1						
Critical Headway (sec)		6.86		6.96						4.16						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.53		3.33						2.23						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			73							9						
Capacity, c (veh/h)			475							1038						
v/c Ratio			0.15							0.01						
95% Queue Length, Qgs (veh)			0.5							0.0						
Control Delay (s/veh)			13.9							8.5						
Level of Service (LOS)			B							A						
Approach Delay (s/veh)		13.9								0.3						
Approach LOS		B														

HCS7 Two-Way Stop-Control Report

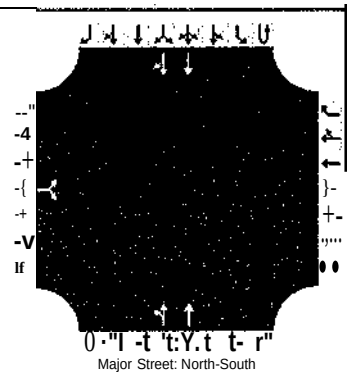
General Information

Analyst	TTE
Agency/Co.	LOCHSA
Date Performed	12/7/2021
Analysis Year	2050
Time Analyzed	PM
Intersection Orientation	North-South
Project Description	

Site Information

Intersection	DRIVEWAY ON STEWART
Jurisdiction	CARSON CITY
East/West Street	DRIVEWAY
North/South Street	STEWART STREET
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U		2	3	4U	4	5	6
Number of Lanes		0		0		0	0	0	0	0	2	0	0	0	2	0
Configuration			LR							LT	T				T	TR
Volume (veh/h)		25		16						28	559				290	41
Percent Heavy Vehicles (%)		3		3						3						
Proportion Time Blocked																
Percent Grade (%)		0														
Right Turn Channelized																
Median Type / Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		7.5		6.9						4.1						
Critical Headway (sec)		6.86		6.96						4.16						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.53		3.33						2.23						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			45							30						
Capacity, c (veh/h)			458							1188						
v/c Ratio			0.10							0.03						
95% Queue Length, Qgs (veh)			0.3							0.1						
Control Delay (s/veh)			13.7							8.1						
Level of Service (LOS)			B							A						
Approach Delay (s/veh)		13.7								0.5						
Approach LOS		B														