S. Carson Street Parallel Route Assessment

(Silver Sage Drive/ S. Roop Street and S. Curry Street/ Cochise Street)

Southwest Carson City Circulation Study

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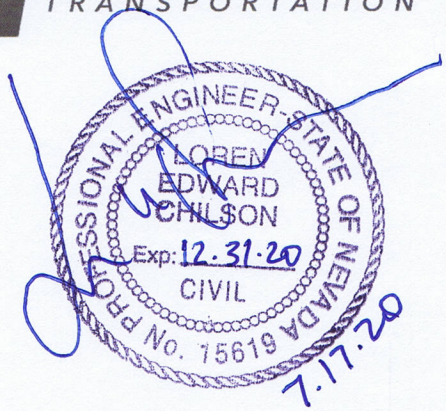
PREPARED FOR:

Carson City

PREPARED BY:

HEADWAY TRANSPORTATION



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EXECUTIVE SUMMARY

The study was undertaken to evaluate the routes of Cochise Street/ S. Curry Street and S. Roop Street/ Silver Sage Drive parallel to S. Carson Street to promote healthy north-south circulation and support redevelopment and business vitality in southwest Carson City. The goal is to identify long-term roadway and intersection improvements that will enhance overall circulation and business success.

The key findings of this study are:

- Both Cochise Street/ S. Curry Street and S. Roop Street/ Silver Sage Drive have adequate capacity to accommodate additional traffic and promote circulation and development in the area. There is excess capacity should additional development be established on or should traffic be attracted to these routes from S. Carson Street.
- The studied intersections are expected to operate within LOS policy in the future year 2040 in their current configurations.
- S. Curry Street and Cochise Street are more commercial and less residential in nature than Silver Sage Drive and therefore are better suited for development and traffic increases.
- To encourage north-south circulation and S. Curry Street/ Cochise Street as a viable parallel route to S. Carson Street, high quality linkages should be created between S. Curry Street and S. Carson Street.

The following improvements (listed in general order of priority, and shown on **Figure 6**) should be considered for inclusion in the next Regional Transportation Plan (RTP) or with other City programs:

- Signalization of the W. Appion Way/S. Carson Street intersection and realignment of Snyder Avenue to W. Appion Way as described in the ***Snyder/Appion Alternatives Analysis*** report
- Extension of Stewart Street to S. Curry Street as a two-lane roadway with appropriate turn lanes, specifics to be determined by future analysis
- Pavement and striping maintenance on S. Curry Street and Cochise Street
- Revise the posted speed limit on S. Curry Street and Cochise Street to be a consistent 30 mph from the Stewart Street extension to Roland Street, subject to the recommendations of a speed limit study
- Consider intersection modifications/change of stop controls at S. Curry Street/ Koontz Lane
- Roadway enhancement of S. Curry Street/Cochise Street from Lake Glen Drive to Rhodes Street, and from Clearview Drive to Roland Street, to include construction of on-street bicycle lanes consistent with the 2040 RTP and Unified Pathways Master Plan
- Signalization of the Rhodes Street/S. Carson Street intersection (potentially privately funded by future development(s) if/when warrants are met)
- Oak Street Improvements – Roland Street to Clearview Drive
- Work collaboratively with property owners to improve access from properties south of the Snyder realignment to Oak Street

INTRODUCTION

The purpose of the study is to evaluate routes parallel to S. Carson Street to support redevelopment and business vitality. The goal is to identify long-term roadway and intersection improvements that will enhance overall circulation and business success. S. Carson Street has been designated for a complete streets redesign, including reducing the number of through lanes in some sections. This study evaluates a broader area and recommends a holistic circulation plan for southwest Carson City.

Given the anticipated growth and development in the area and complete streets project on S. Carson Street, it is beneficial to promote mobility on the valuable parallel corridors, Silver Sage Drive/ S. Roop Street to the east and Cochise Street/ S. Curry Street to the west. Ensuring that these routes offer efficient travel will attract development to the area and promote good overall circulation. The goal is to assess the current and future operations on these routes and identify and mitigate any capacity issues at key intersections.

This study builds upon the following recently completed studies:

- ***Traffic Evaluation for S. Carson Street*** (Headway, May 2019) which analyzed design year 2040 volumes including anticipated development in the area and analyzed key intersections along S. Carson Street. The report provided key recommendations for the complete streets project implementation.
- ***Snyder/ Appion Alternatives Analysis*** (Headway, May 2020) which evaluated alternatives for the realignment of Snyder Avenue with W. Appion Way to provide an additional signalized crossing of S. Carson Street.
- ***Cochise Multifamily TIA*** (Headway, February 2019) that evaluated impacts of a development on Cochise Street at Overland Drive.
- ***Amended Carson Hills SUP for 370 Units Traffic Analysis (Solaegui, March 2018)*** that evaluated the impacts of a multi-family residential development on S. Curry Street between Clearview Drive and Koontz Lane
- ***2040 Regional Transportation Plan***, (Carson Area Metropolitan Planning Organization, August 2016) which outlines the prior long-range planning in the study area.

Study Area and Evaluated Scenarios

The study limits to the west of S. Carson Street include Cochise Street and S. Curry Street between Roland Street and S. Stewart Street. The study limits to the east of S. Carson Street include Silver Sage Drive and S. Roop Street between Snyder Avenue and E. 5th Street; however, adjacent roadways that may service or enhance business development were considered. The study evaluates the roadways as a whole and the following key intersections on each corridor:

- S. Curry Street/ Cochise Street
    - 1. S. Curry Street/ Rhodes Street
    - 2. S. Curry Street/ Koontz Lane
    - 3. Cochise Street/ Clearview Drive

- 4. Cochise Street/ Overland Street
- 5. Cochise Street/ W. Appion Way

- Silver Sage Drive/ S. Roop Street
  - 6. S. Roop Street/ Little Lane
  - 7. Silver Sage Drive/ Colorado Street
  - 8. Silver Sage Drive/ Sonoma Street
  - 9. Silver Sage Drive/ Koontz Lane
  - 10. Silver Sage Drive/ Clearview Drive

The study limits, intersections, corridor roadway configurations and intersection controls are shown in **Figure 1**. **Figure 2** shows an overview of the pedestrian and bicycle facilities. Detail of the lane configurations and controls at the study intersections is presented in **Figure 3**.

This study included analysis of the weekday AM and PM peak hours as these are the periods of time in which peak traffic is anticipated to occur. The evaluated development scenarios are:

- Existing Conditions
- Future Year 2040 Conditions

Traffic Volumes

New traffic counts were conducted at the study intersections in November 2019 with school in regular session. Counts at the three study intersections with Cochise Street (Clearview Drive, Overland Street and W. Appion Way) were collected for the ***Cochise Multifamily TIA*** in August 2018 and increased by 5% to account for seasonality. Counts were collected during the following periods:

- AM period between 7:00 AM and 9:00 AM
- PM period between 4:00 PM and 6:00 PM

Annual Average Daily Traffic (AADT) data from the Nevada Department of Transportation (NDOT) TRINA database was available at four locations within the corridors.

Figure 4 shows the existing traffic volumes and AADT data.

ANALYSIS METHODOLOGY

Level of service (LOS) is a term commonly used by transportation practitioners to measure and describe the operational characteristics of intersections, roadway segments, and other facilities. This term equates seconds of delay per vehicle at intersections to letter grades “A” through “F” with “A” representing optimum conditions and “F” representing breakdown or over capacity flows.

Intersections

Intersection level of service methodology is established in the *Highway Capacity Manual (HCM) 2010*, published by the Transportation Research Board (TRB). The methodology for signalized intersections determines the level of service by comparing the average control delay for the overall intersection to the delay thresholds in **Table 1**. Level of service at unsignalized (side-street stop controlled) intersections is determined by comparing the average control delay for the worst movement/ approach to the delay thresholds in **Table 1.**

Table 1: Level of Service Definition for Intersections

Level of Service	Brief Description	Average Delay (seconds per vehicle)	
		Signalized Intersections	Unsignalized Intersections
A	Free flow conditions.	< 10	< 10
B	Stable conditions with some affect from other vehicles.	10 to 20	10 to 15
C	Stable conditions with significant affect from other vehicles.	20 to 35	15 to 25
D	High density traffic conditions still with stable flow.	35 to 55	25 to 35
E	At or near capacity flows.	55 to 80	35 to 50
F	Over capacity conditions.	> 80	> 50

Source: Highway Capacity Manual (2010), Chapters 18 through 21

Level of service calculations were performed using the Synchro 9 software package with results reported in accordance with the current *HCM 2010* methodology.

Level of Service Policies

Carson City Municipal Code states that "A traffic LOS D or better…shall be maintained through mitigation of impacts from all conditions on all city maintained arterial, and collector roads and at city road intersections, except as noted in the Carson City master plan." Therefore, LOS D or better is deemed an acceptable operating condition. The LOS policy is not specific regarding side streets or minor movements. It is understood that minor movements and side-street approaches on major arterials will commonly operate at LOS E or F during peak hours. This is a commonly accepted and manageable condition because it is not appropriate to signalize every minor street intersecting major arterials.

Hence, LOS "D" was used as the threshold criteria for this analysis consistent with City policy.

EXISTING CONDITIONS

Silver Sage Drive/ S. Roop Street

Silver Sage Drive/ S. Roop Street has a north-south orientation and is parallel to and east of S. Carson Street. The study limits include approximately 2.7 miles of roadway between Snyder Avenue to the south and E. 5th Street to the north. The roadway is classified as a Minor Collector. The posted speed limit is generally 30 mph with a 25-mph section from Fairview Drive to Koontz Lane. The street name is Silver

Sage Drive to the south of Colorado Street and S. Roop Street to the north. The corridor is primarily two or three lanes, one lane in each direction with a continuous two-way-left-turn lane (TWLTL) in some parts. North of Fairview Drive, the corridor is primarily four lanes. There are sections of worn pavement between Pat Lane and Koontz Lane, and between Little Lane and Fairview. All intersections in the project corridor are side-street stop controlled except for:

- Silver Sage Drive at Clearview Drive – All-Way Stop
- Silver Sage Drive at Koontz Lane – All-Way Stop
- Silver Sage Drive at Sonoma Street – All-Way Stop
- Silver Sage Drive at Colorado Street – Signal
- S. Roop Street at Fairview Drive – Signal
- S. Roop at Little Lane – Signal
- S. Roop Street at E 5th Street - Signal

The surrounding land use is a mix of residential and commercial and varies throughout the corridor as characterized below:

- Snyder Avenue to Clearview Drive: primarily residential with direct driveway access
- Clearview Drive to Koontz Lane: primarily commercial or residential with no direct driveway access to single family residential
- Koontz Lane to Sonoma Street: primarily residential with some direct driveway access and limited commercial uses
- Sonoma Street to Colorado Street: primarily residential with direct driveway access
- Colorado Street to Fairview Drive: primarily residential with direct driveway access
- Fairview Drive to E. 5th Street: primarily commercial.

Cochise Street / S. Curry Street

Cochise Street/ S. Curry Street has a north-south orientation and is parallel to and west of S. Carson Street. The study limits are approximately 2.2 miles between Roland Street to the south and S. Stewart Street to the north. Stewart Street does not currently connect to S. Curry Street but is planned to in the future. The roadway is classified as a Minor Collector. The posted speed limit is 25 mph from Roland Street to Moses Street, and 35 mph north of Moses Street to Stewart Street. The street name is Cochise Street to the south of Clearview Drive and S. Curry Street to the north. The corridor is primarily two or three lanes, one lane in each direction with a TWLTL in some parts. Several sections have worn pavement and/or worn striping including:

- W. Appion Way to Clearview Drive
- Clearview Drive to Koontz Lane
- The intersection with Koontz Lane
- Rhodes Street to Stewart Street

Traversing the corridor in the project limits, all intersections are side-street stop controlled except for:

- Cochise Street/ W. Appion Way – Stop on Cochise Street (all-way stop is recommended by prior study condition with future development)
- Cochise Street/ Clearview Drive – All-Way Stop
- S. Curry Street/ Koontz Lane – All-Way Stop

The surrounding land use is primarily commercial and multi-family, and this corridor is anticipated to experience significant growth and development in the future.

Other Parallel Routes

Oak Street could be considered a parallel circulation route, given its north-south orientation and proximity to S. Carson Street. Oak Street is currently under-utilized due to narrow pavement width, lack of formal improvements/only half-street construction in some segments, poor pavement conditions, deep valley gutters at cross-streets that make north-south travel awkward, and informal parking which infringes on the roadway width. The roadway has potential to better serve local businesses and future development in the area but needs major improvements to function as a collector type roadway.

Bicycle and Pedestrian Facilities

Bicycle lanes currently exist along Silver Sage Drive/ S. Roop Street for the study limits. Bicycle lanes also exist along S. Curry Street from Clearview Drive to Rhodes Street. Bicycle lanes on Koontz Street are available traversing S. Carson Street and connecting the parallel corridors. Sidewalks currently exist along Silver Sage Drive/ S. Roop Street from north of Clearview Drive to 5th Street. Sidewalks exist along Cochise Street/ S. Curry Street from W. Appion Way to Rhodes Street.

A 'Safe Routes to School' (SRTS) plan for the area is currently in development. SRTS is a national program to encourage bicycle and pedestrian activity along routes adjacent to schools through infrastructure improvements. In the project area, the preliminary plans recommend intersection crossing enhancements, bicycle network enhancements, walk zone connectivity enhancements and other improvements. The ***Unified Pathways Master Plan for Carson City*** is a comprehensive plan for non-automobile travel including trails, sidewalks, bicycle lanes, and other facilities. The plan outlines pathways to be installed as part of future projects or as funding becomes available. Other projects including those on S. Carson Street and Fairview Drive will have enhanced bicycle and pedestrian connections.

Transit

Jump Around Carson (JAC) provides transit service throughout Carson City. Route 3 services the study area - S. Roop Street, Silver Sage, Koontz Lane, Clearview Drive and Snyder Avenue. BlueGo is another transit service connecting Carson City to the Carson Valley.

Intersection Level of Service Analysis

Existing conditions intersection level of service analysis was performed using Synchro software, with reports based on HCM 2010 methodology. The existing peak hour factors and heavy vehicle percentages were derived from the traffic counts. The level of service results are presented in **Table 2** and the calculation sheets are provided in **Appendix A**, attached.

Table 2: Existing Conditions LOS

Intersection	Control	AM Peak Hour		PM Peak Hour	
		Delay[1]	LOS	Delay[1]	LOS
1. S. Curry Street / Rhodes Street	Side-Street Stop				
Northbound Left		7.6	A	7.7	A
Southbound Left		7.8	A	8.0	A
Eastbound Approach		13.8	B	14.8	B
Westbound Approach		13.1	B	12.7	B
2.S. Curry Street / Koontz Lane	All-Way Stop				
Overall		8.1	A	8.8	A
3. Cochise Street / Clearview Drive	All-Way Stop				
Overall		8.5	A	8.8	A
4. Cochise Street / Overland Drive	Side-Street Stop				
Northbound Left		7.3	A	7.4	A
Southbound Left		7.5	A	7.5	A
Eastbound Approach		9.7	A	7.5	A
Westbound Approach		9.1	A	9.2	A
5. Cochise Street / W. Appion Way	Side-Street Stop				
Northbound Approach		8.4	A	9.1	A
Southbound Approach		9.0	A	9.2	A
Eastbound Left		7.5	A	7.4	A
Westbound Left		7.5	A	7.2	A
6. S. Roop Street / Little Lane	Signal				
Overall		12.6	B	11.5	B
7. Silver Sage Drive / Colorado Street	Signal				
Overall		12.6	B	10.6	B
8. Silver Sage Drive / Sonoma Street	All-Way Stop				
Overall		9.3	A	11.1	B
9. Silver Sage Drive / Koontz Lane	All-Way Stop				
Overall		10.8	B	16.6	C
10. Silver Sage Drive / Clearview Drive	All-Way Stop				
Overall		8.2	A	9.4	A

1. Delay is reported in seconds per vehicle for the overall intersection for signalized intersections, and for the worst approach/ movement for unsignalized intersections.

Source: Headway Transportation, 2020

Under existing conditions, the study intersections operate within the policy of LOS D or better.

Roadway Capacity

The AADT was compared to segment capacity thresholds using HCM methodologies. HCM exhibit 16-14 indicates that roadways with similar characteristics (two lanes, 30 mph) can service between approximately 11,500 - 15,400 vehicles per day for LOS D. The study corridors would likely be on the lower end of the range given the stop-controlled intersections. The highest existing bidirectional AADT in the area was less than 7,400 vehicles per day. This indicates that both corridors have more than adequate remaining capacity. The HCM exhibit is provided in **Appendix A**.

FUTURE CONDITIONS

2040 Roadway Modifications

Significant changes are planned for the study area by the design year 2040. The following projects are in the fiscally constrained transportation improvements in the ***2040 Regional Transportation Plan*** in or near the study area*:*

- Curry Street from Rhodes Street to Lake Glen Drive: Enhancements to two lane road
- Roop Street from Washington Street to Fifth Street: Widen to four lanes. This project is just north of the study limits.
- S. Carson Street corridor from Stewart Street to Freeway Interchange: Complete Streets project to reduce the number lanes each direction

Stewart Street may ultimately be extended to S. Curry Street. This concept is currently in the unconstrained 2040 RTP scenario, but at the time of this report is anticipated to be moved to the constrained RTP scenario in the 2050 RTP.

The S. Carson Street corridor preliminary design was studied in the ***Traffic Evaluation for S. Carson Street.*** The analysis included approved development and complete street modifications for S. Carson Street. A summary of the S. Carson Street modifications are as follows:

- Removal of one northbound and southbound lane from Clearview Drive to Stewart Street.
- Addition of a TWTL from Clearview Drive to Stewart Street
- Removal of one lane northbound from Stewart Street to E. 5th Street
- Conversion of the S. Carson Street/ Stewart Street intersection to a roundabout with three legs
- Implementation of a traffic signal at S. Carson Street/ Rhodes Street with future redevelopment of the vacant Armory site (located on the east side of S. Carson Street opposite Rhodes Street).

As part of the ***Cochise Multifamily Traffic Impact Study,*** the Cochise Street/ W. Appion Way intersection is expected to be converted to an all-way stop controlled intersection.

As part of the ***Carson Hill Traffic Analysis***, Koontz Lane is expected to be extended to form a 4-way intersection with Curry Street. The west approach is recommended to include a left turn lane and a shared through/right turn lane.

The ***Snyder/ Appion Alternatives Analysis*** identified a signalized crossing at S. Carson at W. Appion Way and the realignment of Snyder Avenue to W. Appion Way as the preferred alternative.

2040 Cumulative Traffic Volumes

It is expected that anticipated development and planned roadway projects will increase volumes and shift traffic patterns by the future year scenario. Also, the contemplated connection of Stewart Street from S. Curry Street to S. Carson Street could shift traffic patterns in the north end of the study area. It is not expected that a significant portion of traffic will divert from the southerly segments of S. Carson Street with the complete streets project. In the northern part of the study area, some traffic may move from S. Carson Street to Stewart Street during peak travel times. The intersections on S. Carson were analyzed with the complete streets configuration and are expected to operate acceptably in the design year with implementation of the recommendations presented in the ***Traffic Evaluation for S. Carson Street***. The 2040 Cumulative Traffic Volumes include:

- 0.5% per year background growth
- Anticipated project trips as detailed in the ***Traffic Evaluation for S. Caron Street***, which include the Cochise Multifamily project, Carson Hills Apartments and other approved developments in the study area
- Redistributed traffic associated with the contemplated Stewart Street extension to S. Curry Street.

The 2040 Cumulative volumes and the 2040 daily traffic volumes derived from the current CAMPO model are shown in **Figure 5**.

Future Level of Service

Traffic operations were tested for the 2040 scenario to identify any potential future capacity issues and determine the need for improvements. Future conditions intersection level of service analysis results are presented in **Table 3** and the calculation sheets are provided in **Appendix B**.

Table 3: Future Year 2040 Conditions LOS

Intersection	Control	AM Peak Hour		PM Peak Hour	
		Delay[1]	LOS	Delay[1]	LOS
1. S. Curry Street / Rhodes Street	Side- Street Stop				
Northbound Left		7.8	A	7.9	A
Southbound Left		7.9	A	8.3	A
Eastbound Approach		16.5	C	18.1	C
Westbound Approach		15.5	C	15.2	C
2. S. Curry Street / Koontz Lane	All-Way Stop				
Overall		9.3	A	10.6	B
3. Cochise Street / Clearview Drive	All-Way Stop				
Overall		17.9	C	19.1	C
4. Cochise Street / Overland Drive	Side-Street Stop				
Northbound Left		7.5	A	7.7	A
Southbound Left		8.3	A	8.2	A
Eastbound Approach		16.2	C	18.9	C
Westbound Approach		12.6	B	15.2	C
5. Cochise Street / W. Appion Way with proposed improvements	All-Way Stop				
Overall		14.2	B	12.5	B
6. S. Roop Street / Little Lane	Signal				
Overall		11.0	B	11.7	B
7. Silver Sage Drive / Colorado Street	Signal				
Overall		12.7	B	10.9	B
8. Silver Sage Drive / Sonoma Street	All-Way Stop				
Overall		9.7	A	12.1	B
9. Silver Sage Drive / Koontz Lane	All-Way Stop				
Overall		12.0	B	22.8	C
10. Silver Sage Drive / Clearview Drive	All-Way Stop				
Overall		8.5	A	10.3	B

1. Delay is reported in seconds per vehicle for the overall intersection for signalized intersections, and for the worst approach/movement for unsignalized intersections.

Source: Headway Transportation, 2020

As shown in **Table 3**, all studied intersections operate within the LOS policy in the 2040 scenario.

The analysis results indicate that these intersections have additional capacity for additional development and increased traffic should the roadways become primary circulation routes. Furthermore, while it is not expected that a significant portion of traffic would divert from S. Carson Street, adequate capacity exists should this occur. As an additional test scenario, a 1.5 growth factor was applied to the 2040 PM peak hour traffic volumes. The overall approach LOS at the intersections remained within policy, except for the Silver Sage Drive/ Koontz Lane intersection. Therefore, it is expected that these intersections could service significantly more (50%) traffic if actual volumes exceed projections. The bidirectional AADTs for the 2040 scenario were reviewed and compared to HCM thresholds. The highest bidirectional AADT is 8,600 vehicles per day, still well below HCM thresholds capacity on similar type roadways.

Stewart Street Connection to S. Curry Street

The City is considering an extension of Stewart Street to S. Curry Street. This concept was included in the unconstrained (unfunded) portion of the 2040 RTP but may be moved to the constrained (funded) portion of the 2050 RTP update which is currently in process.

From an overall perspective, this connection would be beneficial in improving local circulation and would provide an additional linkage between S. Curry Street and the east and west sides of S. Carson Street. Detailed traffic operations analysis would be needed to identify the best lane configurations and controls for the connection and adjacent intersections. Alternative locations for a new connection between S. Curry Street and S. Carson Street would not provide the same circulation benefits unless a link on the east side of S. Carson Street was also provided. Stewart Street is the most practical location in the approximately 1-mile stretch between Rhodes Street and 10th Street to provide an east/west linkage. The other intersections with a connection to the east side are Fairview Drive, where a connection is not feasible because of the elevation difference and impacts to the Nevada State Railroad Museum, and Colorado Drive, where a connection would likely have high ROW impacts.

Future Intersection Control Evaluation

The study intersections on S. Curry Street, Cochise Street, S. Roop Street and Silver Sage Drive with either mainline stop or signal control were evaluated using a planning level graph from The *Highway Capacity Manual 2000* which shows the common intersection control type (two-way stop, all-way stop or signal) based on the major and minor streets volumes. The goal was to assess if any of the study intersections may operate more efficiently with a different type of control. One purpose was to identify any intersections that could be considered for conversion to side-street STOP control to promote uninhibited movement along the north-south corridor. This preliminary tool does not provide the *recommended* control, only the *probable* control based on the volumes. Other factors such as lane configuration and turning movements would influence the most efficient control type. The table does not provide specific guidance for roundabouts but indicates that roundabouts may be appropriate within a portion of the volume ranges. Identifying the probable control based on the graph would be the first of several steps in determining appropriate control and changing the control at an intersection. The decision to convert an intersection would be based on several factors and require an engineering study specific to each location. The HCM graph is in **Appendix C,** the results are in **Table 4.**

Table 4: Current Control versus HCM Graph Control

Intersection	Current Control	Control per HCM graph
2. S. Curry Street / Koontz Lane	All-Way Stop	Two-Way Stop
3. Cochise Street / Clearview Drive	All-Way Stop	Two-Way Stop[1]
6. S. Roop Street / Little Lane	Signal	All-Way Stop
7. Silver Sage Drive / Colorado Street	Signal	Two-Way Stop[1]
8. Silver Sage Drive / Sonoma Street	All-Way Stop	Two-Way Stop
9. Silver Sage Drive / Koontz Lane	All-Way Stop	Signal[2]
10. Silver Sage Drive / Clearview Drive	All-Way Stop	Two-Way Stop[1]

1. Near the border of two-way/ all-way stop control
2. Near the border of signal/ all-way stop control

Several intersections may have volumes that are appropriate for different control and could be considered for advanced evaluation if changing the control promoted the City's overall objectives. However, further evaluation should only be pursued if it is justified to do so. For instance, changing from all-way stop control to side-street stop control can promote uninhibited movement through the corridor. However, all-way stop control can promote traffic calming and safety and in some cases better operations. Removal of a traffic signal would not be appropriate in high pedestrian volume locations or where safety factors are a higher priority.

Silver Sage Drive is a primarily residential corridor and all-way stop can be useful in keeping speeds low, promoting traffic calming and can be safer than two-way stops. Furthermore, justification does not exist for evaluating the removal of the signal at Colorado Street or on S. Roop Street / Little Lane. The signals operate well within LOS policy with no identified issues and also provide a safe crossing for pedestrians. Modified control for the Silver Sage intersections was not evaluated.

Since S. Curry Street / Cochise are more commercial in nature, converting an all-way stop to two-way could promote mobility throughout the corridor. The modified control based on **Table 4** was analyzed for the 2040 PM peak hour conditions, as the volumes were generally higher than during the AM peak hour conditions. The results are in **Table 5**; analysis reports are in **Appendix C**.

Table 5: Modified Control LOS

Intersection	Current Control	PM Peak Hour		Potential Modified Control	PM Peak Hour with Modified Control	
		Delay[1]	LOS		Delay[1]	LOS
2. S. Curry Street / Koontz Lane	All-Way Stop			Side-Street Stop		
Northbound Left					7.7	A
Southbound Left					7.8	A
Eastbound Approach					15.9	C
Westbound Approach					16.6	C
Overall		10.6	B			
3. Cochise Street / Clearview Drive	All-Way Stop			Side-Street Stop		
Northbound Left					7.8	A
Southbound Left					9.2	A
Eastbound Approach					52.3	F
Westbound Approach					27.4	D
Overall		19.1	A			

1. Delay is reported in seconds per vehicle for the overall intersection for signalized intersections, and for the worst approach/ movement for unsignalized intersections.

As shown in **Table 5**, the LOS results are within policy for S. Curry Street / Koontz Lane with modified control. The Cochise Street / Clearview Drive operation was not improved with the modification and had LOS F on the side street. Other factors such as safety, driver expectation, number of lanes, etc. should be considered and properly documented in an engineering report prior to changing control.

Roundabout Consideration

Roundabouts were also considered for modified intersection control. Roundabouts can have advantages over stop-control or signalized intersections improving operations and safety but often come with higher construction costs and right-of-way impacts.

The future 2040 volumes at the study intersections are within the volume thresholds in which roundabouts would be expected to operate well. However, no capacity deficiencies were found to justify pursuing roundabout implementation.

North-South Circulation Routes

Providing high-quality circulation routes will foster business success. The study corridors and adjacent routes were reviewed for the purpose of business development and enhanced circulation routes. It is vital that these routes have good connections to/from S. Carson Street.

As S. Curry Street/ Cochise Street has adequate capacity and is primarily commercial; promoting this route as a circulation route would encourage economic development. Several connections to/from S. Carson

Street exist or are planned. On the north end, connections to S. Carson Street currently exist at Rhodes Street, and this intersection is likely to be signalized in the future. An additional connection is being considered to/from Stewart Street. On the south end, connections to/from S. Carson Street would be available at Koontz Lane, Clearview Drive, Overland Street and W. Appion Way. Any of these intersections with S. Curry Street / Cochise Street would have enough capacity to circulate traffic. On the S. Carson Street end, another signalized crossing of S. Carson Street is recommended as identified in the ***Snyder/ Appion Alternatives Analysis***. The preferred alternative from this study is a crossing at W. Appion Way with a realigned Snyder. On both the north and south end, having multiple options will allow traffic to naturally distribute, preventing one connection from overloading.

The S. Roop Street/ Silver Sage Drive corridor is primarily residential between Snyder Avenue and Fairview Drive; therefore, promoting this corridor as a primary circulation route would increase traffic through a residential area. However, there is adequate capacity should traffic divert. Also, the same north/south connections as described for S. Curry Street would be available, as well as interim connections at Fairview Drive, Colorado Street and Sonoma Street, all with adequate capacity.

Oak Street could also provide connectivity and promote circulation. The roadway is parallel to S. Carson Street, extends from Roland Street to Clearview Drive and provides access to several businesses. The roadway needs improvements before it can serve as a primary route or promote development.

Roland Street could serve this purpose as well as it connects Oak Street to Snyder Avenue. Roland Street could potentially be connected and provide access to the frontage road and the parcels that may have restricted access if/when the S. Carson Street/ W. Appion Way/ realigned Snyder Avenue signal is implemented. The roadway could promote access and circulation in the future but needs improvements to function in this capacity.

RECOMMENDATIONS

North-South Circulation Improvements

The S. Roop Street/ Silver Sage Drive corridor is primarily residential between Snyder Avenue and Fairview Drive, and it is not recommended to purposefully encourage additional traffic on this corridor. However, adequate capacity exists on the roadway and at the study intersections to accommodate a shift in traffic if that occurs.

It is recommended that north-south circulation be encouraged on S. Curry Street. The roadway and study intersections have adequate surplus capacity and there are several good connections to/ from S. Carson Street (Appion, Clearview, Rhodes, and potentially a future Stewart Street extension). Creating more options for north-south connectivity parallel to S. Carson Street will improve flow throughout the southwest area of the city. Bicycle lanes on S. Curry Street and Cochise Street, as shown in the Unified Pathways Master Plan 2018, would add even more circulation options for active transportation modes.

Oak Street is parallel to and adjacent to S. Carson Street and therefore could serve as a circulation route if the pavement width, valley gutters, edge conditions, and striping were improved between Roland Street and Clearview Drive. Improvements to Oak Street are not the highest priority but could encourage better use of an existing asset and foster future development/redevelopment in the area.

There are access challenges to the parcels on the east side of S. Carson Street south of the proposed Snyder realignment. Carson City should consider coordination with the property owners at the time of development to identify alternative network connections to Oak Street. For example, connection of the parcel on the frontage road cul-de-sac to Oak Street could enable removal of a driveway/road connection to the Snyder realignment and ultimately benefit the property as well. Coordination with NDOT and adjacent property owner(s) would be necessary.

Roadways

No roadway capacity deficiencies were identified for the future conditions; therefore, there are no recommendations for expansions. The studied roadways are expected to have adequate capacity with the existing number of lanes. Traffic impact studies for future development projects in this study area should evaluate the key intersections and development proposals continue the goals of north-south connectivity. It is also recommended that sections of the roadways with worn pavement or striping be repaired consistent with the City's pavement management program and be accelerated on Cochise and Curry Streets in particular if possible.

Intersections

Operational issues were not identified at the studied intersections; however, if a primary goal of the City is to increase mobility/decrease the number of stops on these routes, the S. Curry Street/ Koontz Lane intersection could be considered for conversion from all-way stop to a side-street stop control. An engineering study would be needed prior to implementing control changes.

Pedestrian and Bicycle Improvements

Recommendations regarding bicycle and pedestrian facilities will be provided in the ***Carson City Safe Routes to School Master Plan***, currently in draft form and the ***Unified Pathways Master Plan***. Generally speaking, sidewalks should be added along all street frontages concurrent with new development.

SUMMARY OF IMPROVEMENTS

The following improvements (listed in general order of priority, and shown on **Figure 6**) should be considered for inclusion in the next Regional Transportation Plan (RTP) or with other City programs:

- Signalization of the W. Appion Way/S. Carson Street intersection and realignment of Snyder Avenue to W. Appion Way as described in the ***Snyder/Appion Alternatives Analysis*** report
- Extension of Stewart Street to S. Curry Street as a two-lane roadway with appropriate turn lanes, specifics to be determined by future analysis
- Pavement and striping maintenance on S. Curry Street and Cochise Street
- Revise the posted speed limit on S. Curry Street and Cochise Street to be a consistent 30 mph from the Stewart Street extension to Roland Street, subject to the recommendations of a speed limit study
- Consider intersection modifications/change of stop controls at S. Curry Street/Koontz Lane

- Roadway enhancement of S. Curry Street/Cochise Street from Lake Glen Drive to Rhodes Street, and from Clearview Drive to Roland Street, to include construction of on-street bicycle lanes consistent with the 2040 RTP and Unified Pathways Master Plan
- Signalization of the Rhodes Street/S. Carson Street intersection (potentially privately funded by future development(s) if/when warrants are met)
- Oak Street Improvements – Roland Street to Clearview Drive
- Work collaboratively with property owners to improve access from properties south of the Snyder realignment to Oak Street

HEADWAY TRANSPORTATION

NO SCALE

Figure 1

S. Carson Street Parallel Route Assessment
Silver Sage Drive / S. Roop Street
S. Curry Street / Cochise Street
Study Area & Segment Lane Configurations

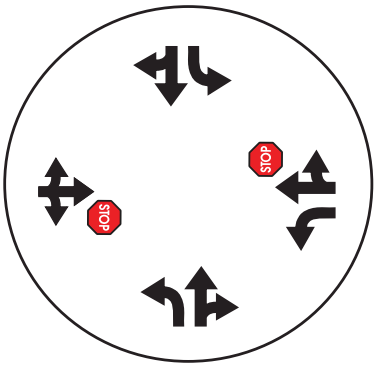
HEADWAY TRANSPORTATION

NO SCALE

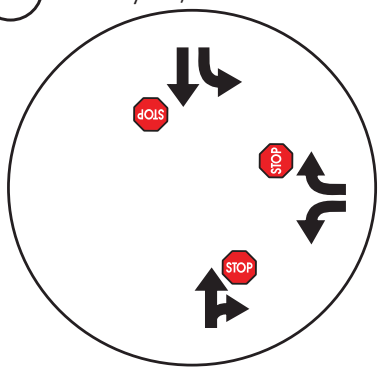
Figure 2

S. Carson Street Parallel Route Assessment
Silver Sage Drive / S. Roop Street
S. Curry Street / Cochise Street
Existing Bicycle / Pedestrian Facilities

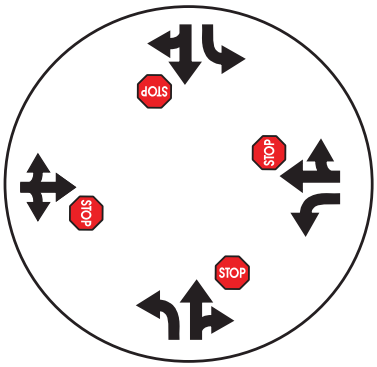
1 S. Curry St / Rhodes St



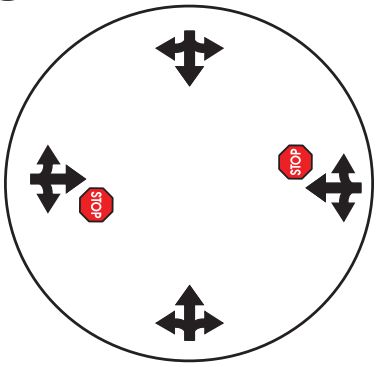
2 S. Curry St / Koontz Ln



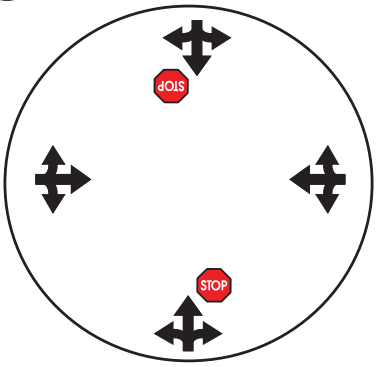
3 Cochise St / Clearview Dr



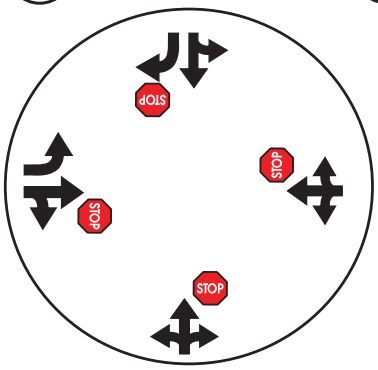
4 Cochise St / Overland St



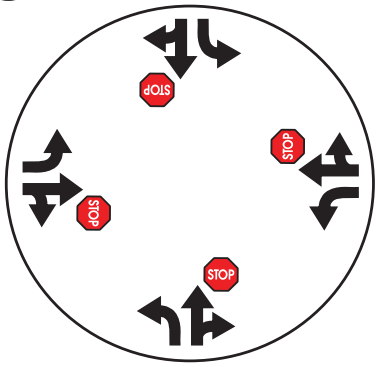
5 Cochise St / Appion Way

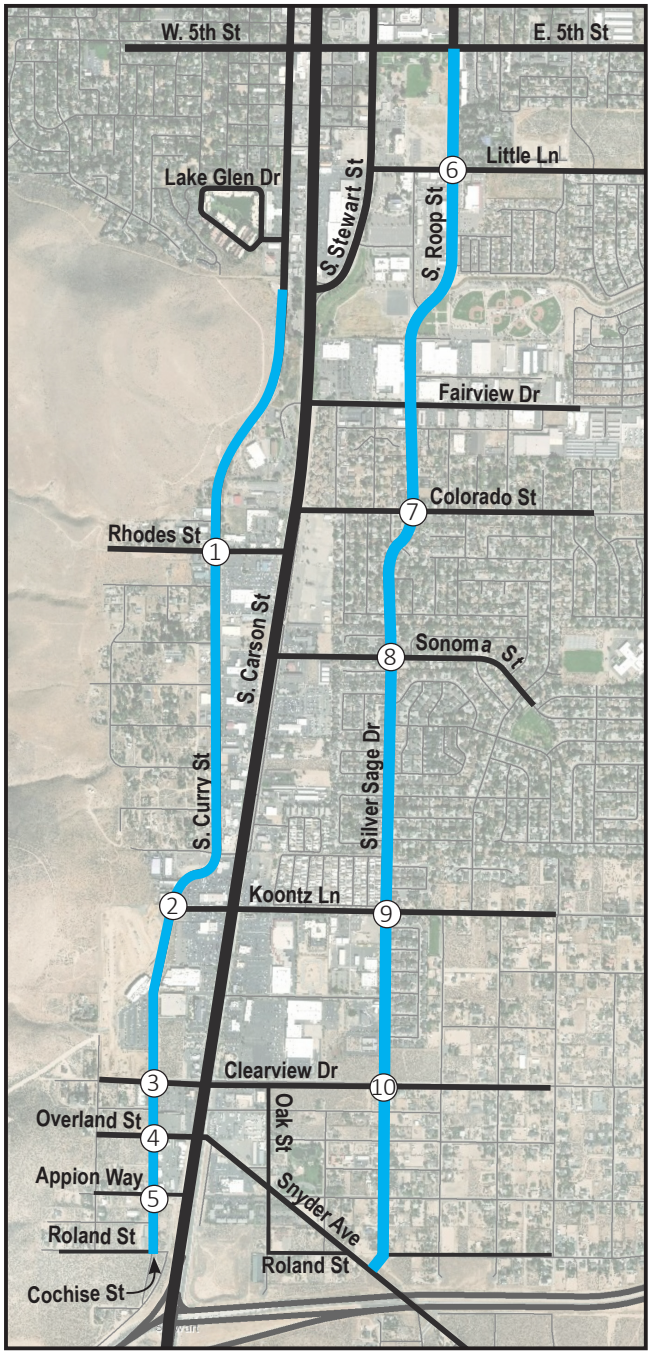


10 Silver Sage Dr / Clearview Dr

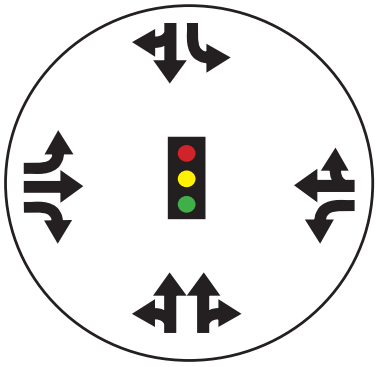


9 Silver Sage Dr / Koontz Ln

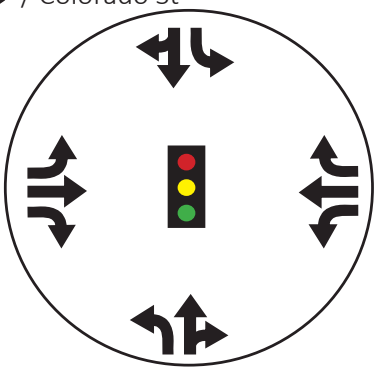




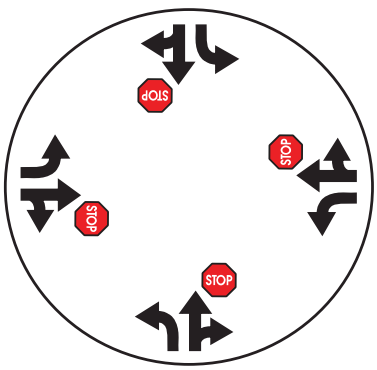
6 S. Roop St / Little Ln



7 S. Roop Street (Silver Sage Dr) / Colorado St



8 Silver Sage Dr / Sonoma St



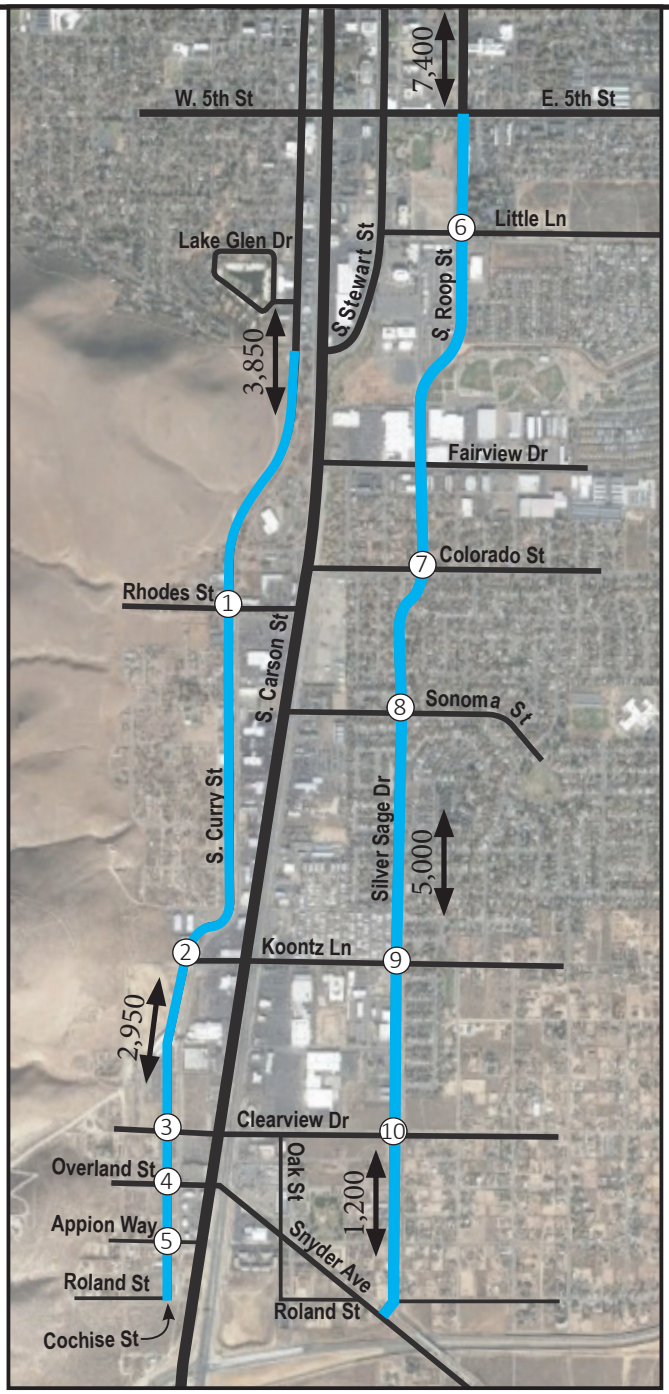
HEADWAY TRANSPORTATION

NO SCALE

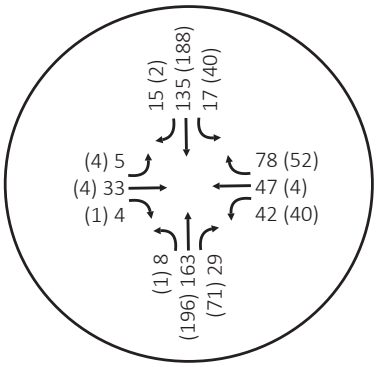
1 - Study Intersection

Figure 3

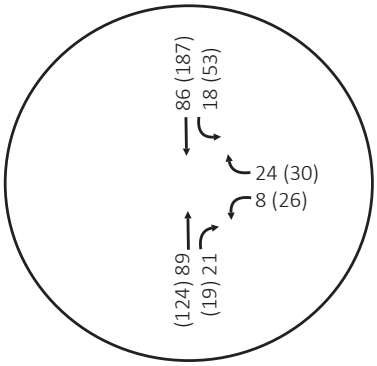
S. Carson Street Parallel Route Assessment
Silver Sage Drive / S. Roop Street
S. Curry Street / Cochise Street
Existing Lane Configurations & Controls



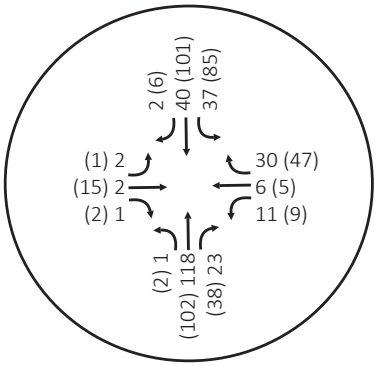
1 S. Curry St / Rhodes St



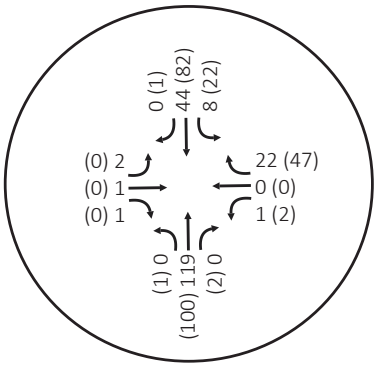
2 S. Curry St / Koontz Ln



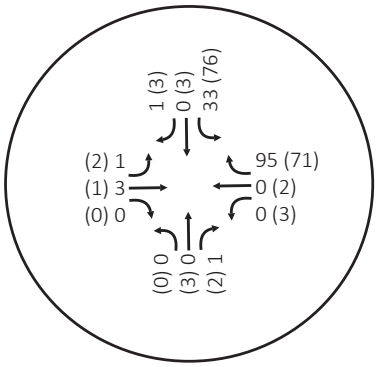
3 Cochise St / Clearview Dr



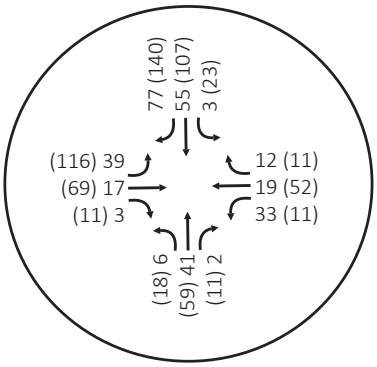
4 Cochise St / Overland St



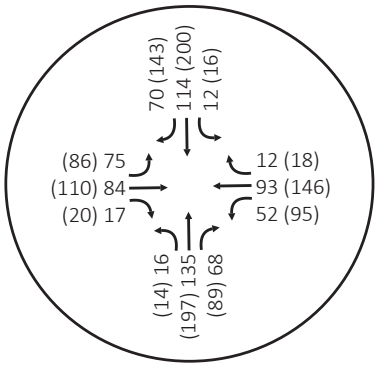
5 Cochise St / Appion Way



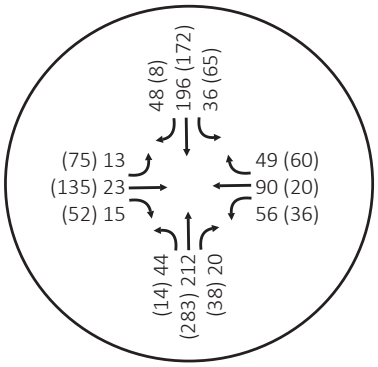
10 Silver Sage Dr / Clearview Dr



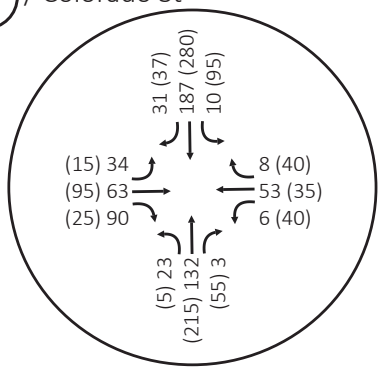
9 Silver Sage Dr / Koontz Ln



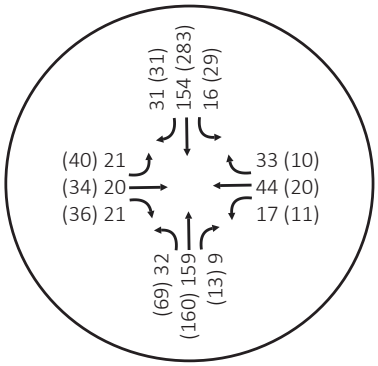
6 S. Roop St / Little Ln



7 S. Roop Street (Silver Sage Dr) / Colorado St



8 Silver Sage Dr / Sonoma St



HEADWAY TRANSPORTATION

NO SCALE

(1) - Study Intersection

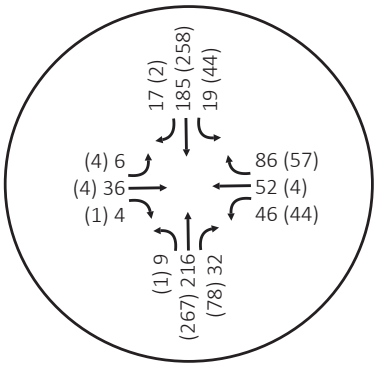
AM (PM) - Peak Hour Traffic Volumes

1,000 - Average Annual Daily Traffic (NDOT, 2019)

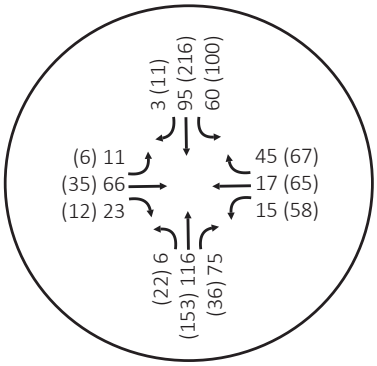
Figure 4

S. Carson Street Parallel Route Assessment
Silver Sage Drive / S. Roop Street
S. Curry Street / Cochise Street
Existing Traffic Volumes

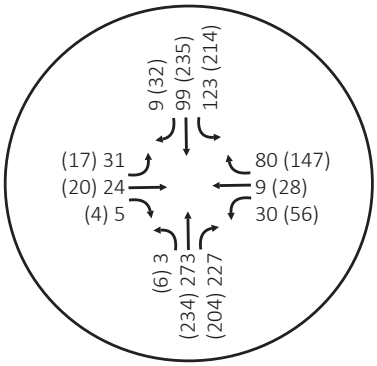
1 S. Curry St / Rhodes St



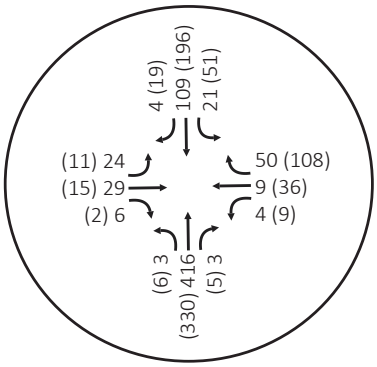
2 S. Curry St / Koontz Ln



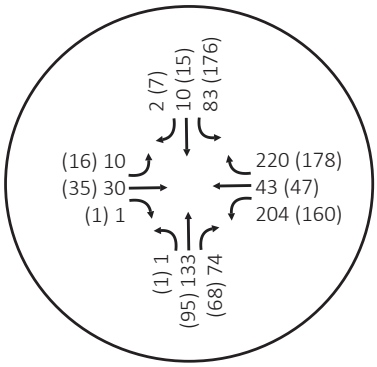
3 Cochise St / Clearview Dr



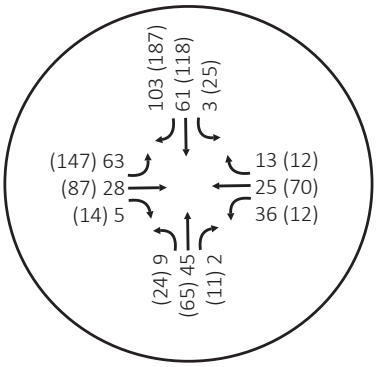
4 Cochise St / Overland St



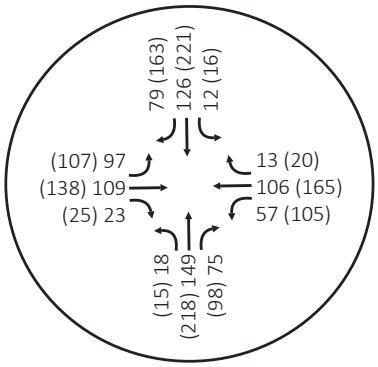
5 Cochise St / Appion Way



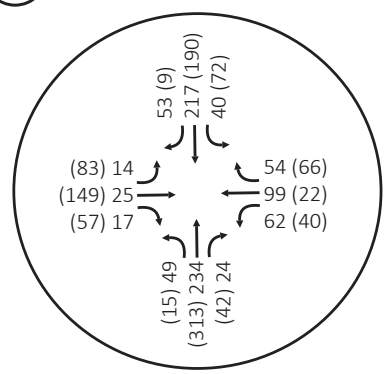
10 Silver Sage Dr / Clearview Dr



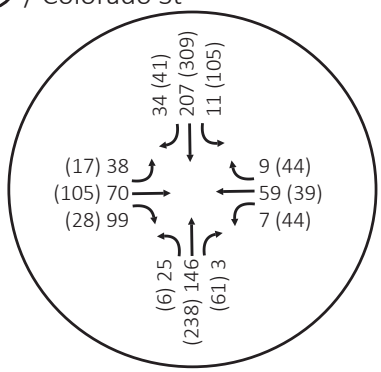
9 Silver Sage Dr / Koontz Ln



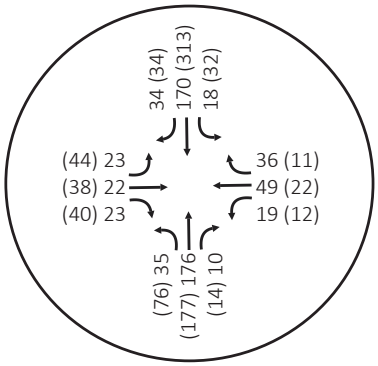
6 S. Roop St / Little Ln



7 S. Roop Street (Silver Sage Dr) / Colorado St



8 Silver Sage Dr / Sonoma St



HEADWAY TRANSPORTATION

NO SCALE

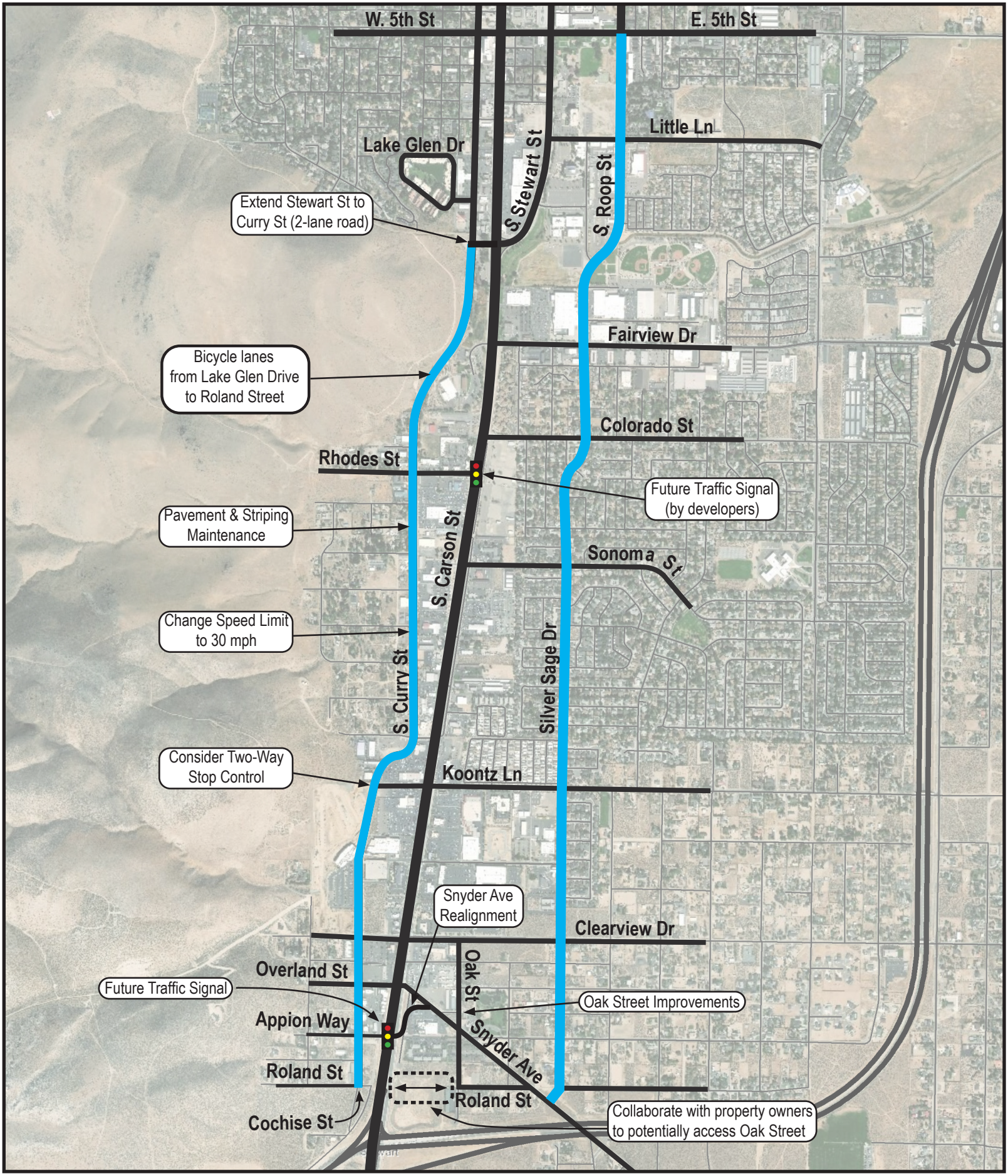
(1) - Study Intersection

AM (PM) - Peak Hour Traffic Volumes

1,000 - Annual Daily Traffic 2040 (CAMPO TDM, 2019)

Figure 5

S. Carson Street Parallel Route Assessment
Silver Sage Drive / S. Roop Street
S. Curry Street / Cochise Street
2040 Traffic Volumes



HEADWAY TRANSPORTATION

NO SCALE

Figure 6

S. Carson Street Parallel Route Assessment
Silver Sage Drive / S. Roop Street
S. Curry Street / Cochise Street
Recommended Improvements

Appendix A

Existing LOS Calculations

Intersection	
Int Delay, s/veh	5.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	33	4	42	47	78	8	163	29	17	135	15
Future Vol, veh/h	5	33	4	42	47	78	8	163	29	17	135	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	150	-	-	150	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	77	77	77	77	77	77	77	77	77	77	77	77
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	6	43	5	55	61	101	10	212	38	22	175	19

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	561	499	185	504	489	231	194	0	0	250	0	0
Stage 1	229	229	-	251	251	-	-	-	-	-	-	-
Stage 2	332	270	-	253	238	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	441	476	862	482	482	813	1391	-	-	1327	-	-
Stage 1	778	718	-	758	703	-	-	-	-	-	-	-
Stage 2	686	690	-	756	712	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	341	465	862	437	470	813	1391	-	-	1327	-	-
Mov Cap-2 Maneuver	341	465	-	437	470	-	-	-	-	-	-	-
Stage 1	773	706	-	753	698	-	-	-	-	-	-	-
Stage 2	544	685	-	694	700	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.8	13.1	0.3	0.8
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1391	-	-	465	437	638	1327	-	-
HCM Lane V/C Ratio	0.007	-	-	0.117	0.125	0.254	0.017	-	-
HCM Control Delay (s)	7.6	-	-	13.8	14.4	12.6	7.8	0	-
HCM Lane LOS	A	-	-	B	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.4	0.4	1	0.1	-	-

Intersection	
Intersection Delay, s/veh	8.1
Intersection LOS	A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	8	24	89	21	18	86
Future Vol, veh/h	8	24	89	21	18	86
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	27	101	24	20	98
Number of Lanes	1	1	1	0	1	1

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	2	1
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	1	0	2
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	2	2	0
HCM Control Delay	7.6	8.2	8.1
HCM LOS	A	A	A

Lane	NBLn1	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	0%	100%	0%	100%	0%
Vol Thru, %	81%	0%	0%	0%	100%
Vol Right, %	19%	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	110	8	24	18	86
LT Vol	0	8	0	18	0
Through Vol	89	0	0	0	86
RT Vol	21	0	24	0	0
Lane Flow Rate	125	9	27	20	98
Geometry Grp	4	7	7	7	7
Degree of Util (X)	0.152	0.014	0.033	0.029	0.126
Departure Headway (Hd)	4.368	5.611	4.406	5.159	4.659
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	813	642	817	691	765
Service Time	2.438	3.311	2.106	2.914	2.412
HCM Lane V/C Ratio	0.154	0.014	0.033	0.029	0.128
HCM Control Delay	8.2	8.4	7.3	8.1	8.1
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0.5	0	0.1	0.1	0.4

Intersection	
Intersection Delay, s/veh	8.5
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	2	1	11	6	30	1	118	23	37	40	2
Future Vol, veh/h	2	2	1	11	6	30	1	118	23	37	40	2
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	2	2	1	13	7	37	1	144	28	45	49	2
Number of Lanes	0	1	0	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	1
HCM Control Delay	8.3	7.9	8.8	8.2
HCM LOS	A	A	A	A

Lane	NBLn1	NBLn2	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	40%	100%	0%	100%	0%
Vol Thru, %	0%	84%	40%	0%	17%	0%	95%
Vol Right, %	0%	16%	20%	0%	83%	0%	5%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	1	141	5	11	36	37	42
LT Vol	1	0	2	11	0	37	0
Through Vol	0	118	2	0	6	0	40
RT Vol	0	23	1	0	30	0	2
Lane Flow Rate	1	172	6	13	44	45	51
Geometry Grp	7	7	6	7	7	7	7
Degree of Util (X)	0.002	0.221	0.009	0.021	0.057	0.068	0.069
Departure Headway (Hd)	5.244	4.629	5.282	5.754	4.666	5.386	4.851
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	674	765	681	625	771	669	743
Service Time	3.038	2.422	3.29	3.459	2.372	3.086	2.551
HCM Lane V/C Ratio	0.001	0.225	0.009	0.021	0.057	0.067	0.069
HCM Control Delay	8	8.8	8.3	8.6	7.7	8.5	7.9
HCM Lane LOS	A	A	A	A	A	A	A
HCM 95th-tile Q	0	0.8	0	0.1	0.2	0.2	0.2

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	1	1	1	0	22	0	119	0	8	44	0
Future Vol, veh/h	2	1	1	1	0	22	0	119	0	8	44	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	2	1	1	1	0	24	0	129	0	9	48	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	207	195	48	196	195	129	48	0	0	129	0	0
Stage 1	66	66	-	129	129	-	-	-	-	-	-	-
Stage 2	141	129	-	67	66	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	748	699	1018	761	699	918	1553	-	-	1451	-	-
Stage 1	942	838	-	872	787	-	-	-	-	-	-	-
Stage 2	860	787	-	941	838	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	725	695	1018	756	695	918	1553	-	-	1451	-	-
Mov Cap-2 Maneuver	725	695	-	756	695	-	-	-	-	-	-	-
Stage 1	942	833	-	872	787	-	-	-	-	-	-	-
Stage 2	838	787	-	933	833	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.7	9.1	0	1.2
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1553	-	-	772	910	1451	-	-
HCM Lane V/C Ratio	-	-	-	0.006	0.027	0.006	-	-
HCM Control Delay (s)	0	-	-	9.7	9.1	7.5	0	-
HCM Lane LOS	A	-	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.1	0	-	-

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	3	0	0	0	95	0	0	1	33	0	1
Future Vol, veh/h	1	3	0	0	0	95	0	0	1	33	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	1	3	0	0	0	104	0	0	1	36	0	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	104	0	0	3	0	0	58	109	3	58	57	52
Stage 1	-	-	-	-	-	-	5	5	-	52	52	-
Stage 2	-	-	-	-	-	-	53	104	-	6	5	-
Critical Hdwy	4.15	-	-	4.15	-	-	7.15	6.55	6.25	7.15	6.55	6.25
Critical Hdwy Stg 1	-	-	-	-	-	-	6.15	5.55	-	6.15	5.55	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.15	5.55	-	6.15	5.55	-
Follow-up Hdwy	2.245	-	-	2.245	-	-	3.545	4.045	3.345	3.545	4.045	3.345
Pot Cap-1 Maneuver	1469	-	-	1600	-	-	931	775	1072	931	828	1007
Stage 1	-	-	-	-	-	-	1009	886	-	953	846	-
Stage 2	-	-	-	-	-	-	952	803	-	1008	886	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1469	-	-	1600	-	-	929	774	1072	929	827	1007
Mov Cap-2 Maneuver	-	-	-	-	-	-	929	774	-	929	827	-
Stage 1	-	-	-	-	-	-	1008	885	-	952	846	-
Stage 2	-	-	-	-	-	-	951	803	-	1006	885	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.9	0	8.4	9
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	1072	1469	-	-	1600	-	-	931
HCM Lane V/C Ratio	0.001	0.001	-	-	-	-	-	0.04
HCM Control Delay (s)	8.4	7.5	0	-	0	-	-	9
HCM Lane LOS	A	A	A	-	A	-	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	23	15	56	90	49	44	212	20	36	196	48
Future Volume (veh/h)	13	23	15	56	90	49	44	212	20	36	196	48
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	16	29	19	70	112	61	55	265	25	45	245	60
Adj No. of Lanes	1	1	1	1	1	0	0	2	0	1	1	0
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	147	248	211	168	164	89	296	1354	129	653	769	188
Arrive On Green	0.08	0.13	0.13	0.09	0.14	0.14	0.52	0.52	0.52	0.52	0.52	0.52
Sat Flow, veh/h	1810	1900	1615	1810	1158	631	396	2599	247	1106	1475	361
Grp Volume(v), veh/h	16	29	19	70	0	173	175	0	170	45	0	305
Grp Sat Flow(s),veh/h/ln	1810	1900	1615	1810	0	1789	1557	0	1685	1106	0	1836
Q Serve(g_s), s	0.4	0.7	0.5	1.9	0.0	4.9	0.1	0.0	2.8	1.2	0.0	5.0
Cycle Q Clear(g_c), s	0.4	0.7	0.5	1.9	0.0	4.9	5.1	0.0	2.8	4.0	0.0	5.0
Prop In Lane	1.00		1.00	1.00		0.35	0.32		0.15	1.00		0.20
Lane Grp Cap(c), veh/h	147	248	211	168	0	254	901	0	878	653	0	957
V/C Ratio(X)	0.11	0.12	0.09	0.42	0.00	0.68	0.19	0.00	0.19	0.07	0.00	0.32
Avail Cap(c_a), veh/h	634	702	597	669	0	695	901	0	878	653	0	957
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	22.5	20.3	20.2	22.6	0.0	21.5	6.7	0.0	6.7	7.8	0.0	7.3
Incr Delay (d2), s/veh	0.3	0.2	0.2	1.7	0.0	3.2	0.5	0.0	0.5	0.2	0.0	0.9
Initial Q Delay(d3),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
%ile BackOfQ(50%),veh/ln	0.2	0.4	0.3	1.0	0.0	2.6	1.4	0.0	1.4	0.4	0.0	2.8
LnGrp Delay(d),s/veh	22.8	20.5	20.4	24.3	0.0	24.7	7.2	0.0	7.2	8.0	0.0	8.1
LnGrp LOS	C	C	C	C		C	A		A	A		A
Approach Vol, veh/h		64			243			345			350	
Approach Delay, s/veh		21.0			24.6			7.2			8.1	
Approach LOS		C			C			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		32.0	9.4	11.4		32.0	8.8	12.0
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		27.5	19.5	19.5		27.5	18.5	20.5
Max Q Clear Time (g_c+I1), s		7.1	3.9	2.7		7.0	2.4	6.9
Green Ext Time (p_c), s		2.0	0.1	0.1		2.0	0.0	0.7

Intersection Summary	
HCM 2010 Ctrl Delay	12.6
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	34	63	90	6	53	8	23	132	3	10	187	31
Future Volume (veh/h)	34	63	90	6	53	8	23	132	3	10	187	31
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	36	66	95	6	56	8	24	139	3	11	197	33
Adj No. of Lanes	1	1	1	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	226	194	165	218	166	24	849	1183	26	928	991	166
Arrive On Green	0.10	0.10	0.10	0.10	0.10	0.10	0.03	0.64	0.64	0.01	0.62	0.62
Sat Flow, veh/h	1359	1900	1615	1245	1627	232	1810	1853	40	1810	1587	266
Grp Volume(v), veh/h	36	66	95	6	0	64	24	0	142	11	0	230
Grp Sat Flow(s),veh/h/ln	1359	1900	1615	1245	0	1859	1810	0	1893	1810	0	1853
Q Serve(g_s), s	1.4	1.8	3.1	0.2	0.0	1.8	0.3	0.0	1.6	0.1	0.0	2.9
Cycle Q Clear(g_c), s	3.2	1.8	3.1	2.0	0.0	1.8	0.3	0.0	1.6	0.1	0.0	2.9
Prop In Lane	1.00		1.00	1.00		0.13	1.00		0.02	1.00		0.14
Lane Grp Cap(c), veh/h	226	194	165	218	0	190	849	0	1208	928	0	1157
V/C Ratio(X)	0.16	0.34	0.58	0.03	0.00	0.34	0.03	0.00	0.12	0.01	0.00	0.20
Avail Cap(c_a), veh/h	532	622	529	498	0	608	963	0	1208	1067	0	1157
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	24.4	23.0	23.6	23.9	0.0	23.0	3.4	0.0	3.9	3.6	0.0	4.4
Incr Delay (d2), s/veh	0.3	1.0	3.2	0.1	0.0	1.0	0.0	0.0	0.2	0.0	0.0	0.4
Initial Q Delay(d3),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
%ile BackOfQ(50%),veh/ln	0.5	1.0	1.5	0.1	0.0	1.0	0.1	0.0	0.9	0.1	0.0	1.6
LnGrp Delay(d),s/veh	24.8	24.0	26.7	24.0	0.0	24.0	3.5	0.0	4.1	3.6	0.0	4.8
LnGrp LOS	C	C	C	C		C	A		A	A		A
Approach Vol, veh/h		197			70			166			241	
Approach Delay, s/veh		25.4			24.0			4.0			4.8	
Approach LOS		C			C			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.3	39.6		10.1	6.0	38.9		10.1
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	5.0	18.5		18.0	5.0	18.5		18.0
Max Q Clear Time (g_c+I1), s	2.1	3.6		5.2	2.3	4.9		4.0
Green Ext Time (p_c), s	0.0	0.6		0.6	0.0	1.0		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	12.6
HCM 2010 LOS	B

Intersection	
Intersection Delay, s/veh	9.3
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	21	20	21	17	44	33	32	159	9	16	154	31
Future Vol, veh/h	21	20	21	17	44	33	32	159	9	16	154	31
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	22	21	22	18	46	35	34	167	9	17	162	33
Number of Lanes	1	1	0	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	8.7	8.9	9.5	9.6
HCM LOS	A	A	A	A

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%
Vol Thru, %	0%	95%	0%	49%	0%	57%	0%	83%
Vol Right, %	0%	5%	0%	51%	0%	43%	0%	17%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	32	168	21	41	17	77	16	185
LT Vol	32	0	21	0	17	0	16	0
Through Vol	0	159	0	20	0	44	0	154
RT Vol	0	9	0	21	0	33	0	31
Lane Flow Rate	34	177	22	43	18	81	17	195
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.053	0.25	0.038	0.064	0.03	0.12	0.026	0.272
Departure Headway (Hd)	5.639	5.099	6.171	5.305	6.127	5.32	5.645	5.025
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	634	702	578	672	583	671	633	713
Service Time	3.386	2.845	3.929	3.062	3.882	3.075	3.391	2.77
HCM Lane V/C Ratio	0.054	0.252	0.038	0.064	0.031	0.121	0.027	0.273
HCM Control Delay	8.7	9.6	9.2	8.4	9.1	8.8	8.5	9.7
HCM Lane LOS	A	A	A	A	A	A	A	A
HCM 95th-tile Q	0.2	1	0.1	0.2	0.1	0.4	0.1	1.1

Intersection	
Intersection Delay, s/veh	10.8
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	75	84	17	52	93	12	16	135	68	12	114	70
Future Vol, veh/h	75	84	17	52	93	12	16	135	68	12	114	70
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	84	94	19	58	104	13	18	152	76	13	128	79
Number of Lanes	1	1	0	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	10.3	10.3	11.4	11.1
HCM LOS	B	B	B	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%
Vol Thru, %	0%	67%	0%	83%	0%	89%	0%	62%
Vol Right, %	0%	33%	0%	17%	0%	11%	0%	38%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	16	203	75	101	52	105	12	184
LT Vol	16	0	75	0	52	0	12	0
Through Vol	0	135	0	84	0	93	0	114
RT Vol	0	68	0	17	0	12	0	70
Lane Flow Rate	18	228	84	113	58	118	13	207
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.032	0.361	0.155	0.189	0.108	0.199	0.024	0.327
Departure Headway (Hd)	6.439	5.696	6.615	5.989	6.651	6.063	6.477	5.701
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	556	632	542	598	539	591	552	631
Service Time	4.179	3.435	4.357	3.731	4.394	3.806	4.219	3.443
HCM Lane V/C Ratio	0.032	0.361	0.155	0.189	0.108	0.2	0.024	0.328
HCM Control Delay	9.4	11.6	10.6	10.1	10.2	10.3	9.4	11.2
HCM Lane LOS	A	B	B	B	B	B	A	B
HCM 95th-tile Q	0.1	1.6	0.5	0.7	0.4	0.7	0.1	1.4

Intersection	
Intersection Delay, s/veh	8.2
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	39	17	3	33	19	12	6	41	2	3	55	77
Future Vol, veh/h	39	17	3	33	19	12	6	41	2	3	55	77
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	44	19	3	37	21	13	7	46	2	3	62	87
Number of Lanes	1	1	0	0	1	0	0	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	1	2
HCM Control Delay	8.4	8.7	8.5	7.7
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1	SBLn1	SBLn2
Vol Left, %	12%	100%	0%	52%	5%	0%
Vol Thru, %	84%	0%	85%	30%	95%	0%
Vol Right, %	4%	0%	15%	19%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	49	39	20	64	58	77
LT Vol	6	39	0	33	3	0
Through Vol	41	0	17	19	55	0
RT Vol	2	0	3	12	0	77
Lane Flow Rate	55	44	22	72	65	87
Geometry Grp	6	7	7	6	7	7
Degree of Util (X)	0.077	0.068	0.031	0.101	0.09	0.101
Departure Headway (Hd)	5.032	5.558	4.95	5.062	4.945	4.217
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	714	646	725	710	727	852
Service Time	3.049	3.277	2.669	3.081	2.658	1.93
HCM Lane V/C Ratio	0.077	0.068	0.03	0.101	0.089	0.102
HCM Control Delay	8.5	8.7	7.8	8.7	8.1	7.4
HCM Lane LOS	A	A	A	A	A	A
HCM 95th-tile Q	0.2	0.2	0.1	0.3	0.3	0.3

Intersection	
Int Delay, s/veh	2.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	4	1	40	4	52	1	196	71	40	188	2
Future Vol, veh/h	4	4	1	40	4	52	1	196	71	40	188	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	150	-	-	150	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	82	82	82	82	82	82	82	82	82
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	5	5	1	49	5	63	1	239	87	49	229	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	647	656	230	616	614	283	231	0	0	326	0	0
Stage 1	328	328	-	285	285	-	-	-	-	-	-	-
Stage 2	319	328	-	331	329	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	387	388	814	406	410	761	1349	-	-	1245	-	-
Stage 1	689	651	-	727	679	-	-	-	-	-	-	-
Stage 2	697	651	-	687	650	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	341	372	814	389	394	761	1349	-	-	1245	-	-
Mov Cap-2 Maneuver	341	372	-	389	394	-	-	-	-	-	-	-
Stage 1	688	626	-	726	678	-	-	-	-	-	-	-
Stage 2	634	650	-	654	625	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14.8	12.7	0	1.4
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1349	-	-	380	389	714	1245	-	-
HCM Lane V/C Ratio	0.001	-	-	0.029	0.125	0.096	0.039	-	-
HCM Control Delay (s)	7.7	-	-	14.8	15.6	10.6	8	0	-
HCM Lane LOS	A	-	-	B	C	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.4	0.3	0.1	-	-

Intersection	
Intersection Delay, s/veh	8.8
Intersection LOS	A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	26	30	124	19	53	187
Future Vol, veh/h	26	30	124	19	53	187
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	27	31	129	20	55	195
Number of Lanes	1	1	1	0	1	1

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	2	1
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	1	0	2
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	2	2	0
HCM Control Delay	8.3	8.8	9
HCM LOS	A	A	A

Lane	NBLn1	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	0%	100%	0%	100%	0%
Vol Thru, %	87%	0%	0%	0%	100%
Vol Right, %	13%	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	143	26	30	53	187
LT Vol	0	26	0	53	0
Through Vol	124	0	0	0	187
RT Vol	19	0	30	0	0
Lane Flow Rate	149	27	31	55	195
Geometry Grp	4	7	7	7	7
Degree of Util (X)	0.194	0.045	0.041	0.082	0.261
Departure Headway (Hd)	4.682	5.986	4.779	5.318	4.817
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	769	599	750	678	750
Service Time	2.697	3.71	2.502	3.018	2.517
HCM Lane V/C Ratio	0.194	0.045	0.041	0.081	0.26
HCM Control Delay	8.8	9	7.7	8.5	9.2
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0.7	0.1	0.1	0.3	1

Intersection	
Intersection Delay, s/veh	8.8
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	15	2	9	5	47	2	102	38	85	101	6
Future Vol, veh/h	1	15	2	9	5	47	2	102	38	85	101	6
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	1	19	2	11	6	58	2	126	47	105	125	7
Number of Lanes	0	1	0	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	1
HCM Control Delay	8.8	8.2	9	8.9
HCM LOS	A	A	A	A

Lane	NBLn1	NBLn2	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	6%	100%	0%	100%	0%
Vol Thru, %	0%	73%	83%	0%	10%	0%	94%
Vol Right, %	0%	27%	11%	0%	90%	0%	6%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	2	140	18	9	52	85	107
LT Vol	2	0	1	9	0	85	0
Through Vol	0	102	15	0	5	0	101
RT Vol	0	38	2	0	47	0	6
Lane Flow Rate	2	173	22	11	64	105	132
Geometry Grp	7	7	6	7	7	7	7
Degree of Util (X)	0.004	0.232	0.034	0.019	0.088	0.159	0.18
Departure Headway (Hd)	5.525	4.833	5.587	6.075	4.936	5.45	4.909
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	649	743	641	590	726	659	732
Service Time	3.251	2.558	3.623	3.806	2.666	3.174	2.632
HCM Lane V/C Ratio	0.003	0.233	0.034	0.019	0.088	0.159	0.18
HCM Control Delay	8.3	9	8.8	8.9	8.1	9.2	8.7
HCM Lane LOS	A	A	A	A	A	A	A
HCM 95th-tile Q	0	0.9	0.1	0.1	0.3	0.6	0.7

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	0	2	0	47	1	100	2	22	82	1
Future Vol, veh/h	0	0	0	2	0	47	1	100	2	22	82	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	84	84	84	84	84	84	84	84	84	84	84	84
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	0	0	0	2	0	56	1	119	2	26	98	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	301	274	99	273	273	120	99	0	0	121	0	0
Stage 1	151	151	-	122	122	-	-	-	-	-	-	-
Stage 2	150	123	-	151	151	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	649	631	954	677	632	929	1488	-	-	1460	-	-
Stage 1	849	770	-	880	793	-	-	-	-	-	-	-
Stage 2	850	792	-	849	770	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	600	618	954	667	619	929	1488	-	-	1460	-	-
Mov Cap-2 Maneuver	600	618	-	667	619	-	-	-	-	-	-	-
Stage 1	848	755	-	879	792	-	-	-	-	-	-	-
Stage 2	798	791	-	833	755	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	9.2	0.1	1.6
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1488	-	-	-	914	1460	-	-
HCM Lane V/C Ratio	0.001	-	-	-	0.064	0.018	-	-
HCM Control Delay (s)	7.4	0	-	0	9.2	7.5	0	-
HCM Lane LOS	A	A	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	-	0.2	0.1	-	-

Intersection	
Int Delay, s/veh	5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	1	0	3	2	71	0	3	2	76	3	3
Future Vol, veh/h	2	1	0	3	2	71	0	3	2	76	3	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	2	1	0	3	2	77	0	3	2	83	3	3

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	79	0	0	1	0	0	55	90	1	55	52	41
Stage 1	-	-	-	-	-	-	5	5	-	47	47	-
Stage 2	-	-	-	-	-	-	50	85	-	8	5	-
Critical Hdwy	4.11	-	-	4.11	-	-	7.11	6.51	6.21	7.11	6.51	6.21
Critical Hdwy Stg 1	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Follow-up Hdwy	2.209	-	-	2.209	-	-	3.509	4.009	3.309	3.509	4.009	3.309
Pot Cap-1 Maneuver	1526	-	-	1628	-	-	945	802	1087	945	841	1033
Stage 1	-	-	-	-	-	-	1020	894	-	969	858	-
Stage 2	-	-	-	-	-	-	966	826	-	1016	894	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1526	-	-	1628	-	-	937	800	1087	938	838	1033
Mov Cap-2 Maneuver	-	-	-	-	-	-	937	800	-	938	838	-
Stage 1	-	-	-	-	-	-	1019	893	-	968	856	-
Stage 2	-	-	-	-	-	-	957	824	-	1009	893	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	4.9	0.3	9.1	9.2
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	894	1526	-	-	1628	-	-	937
HCM Lane V/C Ratio	0.006	0.001	-	-	0.002	-	-	0.095
HCM Control Delay (s)	9.1	7.4	0	-	7.2	0	-	9.2
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	75	135	52	36	20	60	14	283	38	65	172	8
Future Volume (veh/h)	75	135	52	36	20	60	14	283	38	65	172	8
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	81	145	56	39	22	65	15	304	41	70	185	9
Adj No. of Lanes	1	1	1	1	1	0	0	2	0	1	1	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	135	293	249	80	52	155	120	1412	184	600	823	40
Arrive On Green	0.07	0.15	0.15	0.04	0.12	0.12	0.46	0.46	0.46	0.46	0.46	0.46
Sat Flow, veh/h	1810	1900	1615	1810	424	1254	46	3083	402	1052	1797	87
Grp Volume(v), veh/h	81	145	56	39	0	87	191	0	169	70	0	194
Grp Sat Flow(s),veh/h/ln	1810	1900	1615	1810	0	1679	1873	0	1658	1052	0	1885
Q Serve(g_s), s	1.7	2.7	1.2	0.8	0.0	1.9	0.0	0.0	2.4	1.7	0.0	2.4
Cycle Q Clear(g_c), s	1.7	2.7	1.2	0.8	0.0	1.9	2.4	0.0	2.4	4.1	0.0	2.4
Prop In Lane	1.00		1.00	1.00		0.75	0.08		0.24	1.00		0.05
Lane Grp Cap(c), veh/h	135	293	249	80	0	208	957	0	760	600	0	863
V/C Ratio(X)	0.60	0.49	0.22	0.49	0.00	0.42	0.20	0.00	0.22	0.12	0.00	0.22
Avail Cap(c_a), veh/h	253	875	744	249	0	769	957	0	760	600	0	863
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	17.6	15.2	14.6	18.3	0.0	15.9	6.4	0.0	6.4	7.7	0.0	6.4
Incr Delay (d2), s/veh	4.2	1.3	0.5	4.6	0.0	1.3	0.5	0.0	0.7	0.4	0.0	0.6
Initial Q Delay(d3),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
%ile BackOfQ(50%),veh/ln	1.0	1.5	0.6	0.5	0.0	0.9	1.3	0.0	1.2	0.6	0.0	1.4
LnGrp Delay(d),s/veh	21.8	16.5	15.0	22.9	0.0	17.3	6.9	0.0	7.1	8.1	0.0	7.0
LnGrp LOS	C	B	B	C		B	A		A	A		A
Approach Vol, veh/h		282			126			360			264	
Approach Delay, s/veh		17.7			19.0			7.0			7.3	
Approach LOS		B			B			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		22.5	6.2	10.6		22.5	7.4	9.4
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		18.0	5.4	18.1		18.0	5.5	18.0
Max Q Clear Time (g_c+I1), s		4.4	2.8	4.7		6.1	3.7	3.9
Green Ext Time (p_c), s		1.7	0.0	0.7		1.0	0.0	0.3

Intersection Summary	
HCM 2010 Ctrl Delay	11.5
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	95	25	40	35	40	5	215	55	95	280	37
Future Volume (veh/h)	15	95	25	40	35	40	5	215	55	95	280	37
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	16	104	27	44	38	44	5	236	60	104	308	41
Adj No. of Lanes	1	1	1	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	240	237	201	226	100	116	705	815	207	782	1024	136
Arrive On Green	0.12	0.12	0.12	0.12	0.12	0.12	0.01	0.56	0.56	0.07	0.62	0.62
Sat Flow, veh/h	1337	1900	1615	1279	804	931	1810	1463	372	1810	1643	219
Grp Volume(v), veh/h	16	104	27	44	0	82	5	0	296	104	0	349
Grp Sat Flow(s),veh/h/ln	1337	1900	1615	1279	0	1736	1810	0	1834	1810	0	1861
Q Serve(g_s), s	0.6	2.8	0.8	1.8	0.0	2.4	0.1	0.0	4.7	1.2	0.0	4.8
Cycle Q Clear(g_c), s	3.0	2.8	0.8	4.6	0.0	2.4	0.1	0.0	4.7	1.2	0.0	4.8
Prop In Lane	1.00		1.00	1.00		0.54	1.00		0.20	1.00		0.12
Lane Grp Cap(c), veh/h	240	237	201	226	0	216	705	0	1023	782	0	1160
V/C Ratio(X)	0.07	0.44	0.13	0.20	0.00	0.38	0.01	0.00	0.29	0.13	0.00	0.30
Avail Cap(c_a), veh/h	510	622	529	485	0	568	858	0	1023	832	0	1160
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	23.5	22.3	21.4	24.4	0.0	22.1	5.2	0.0	6.4	3.9	0.0	4.8
Incr Delay (d2), s/veh	0.1	1.3	0.3	0.4	0.0	1.1	0.0	0.0	0.7	0.1	0.0	0.7
Initial Q Delay(d3),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
%ile BackOfQ(50%),veh/ln	0.2	1.5	0.4	0.7	0.0	1.2	0.0	0.0	2.5	0.6	0.0	2.6
LnGrp Delay(d),s/veh	23.6	23.6	21.7	24.8	0.0	23.2	5.3	0.0	7.1	4.0	0.0	5.5
LnGrp LOS	C	C	C	C		C	A		A	A		A
Approach Vol, veh/h		147			126			301			453	
Approach Delay, s/veh		23.2			23.8			7.1			5.1	
Approach LOS		C			C			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.5	35.2		11.4	4.9	38.8		11.4
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	5.5	18.0		18.0	5.0	18.5		18.0
Max Q Clear Time (g_c+I1), s	3.2	6.7		5.0	2.1	6.8		6.6
Green Ext Time (p_c), s	0.0	1.3		0.5	0.0	1.6		0.4

Intersection Summary	
HCM 2010 Ctrl Delay	10.6
HCM 2010 LOS	B

Intersection	
Intersection Delay, s/veh	11.1
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	40	34	36	11	20	10	69	160	13	29	283	31
Future Vol, veh/h	40	34	36	11	20	10	69	160	13	29	283	31
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	43	37	39	12	22	11	75	174	14	32	308	34
Number of Lanes	1	1	0	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	9.6	9.3	9.9	12.6
HCM LOS	A	A	A	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%
Vol Thru, %	0%	92%	0%	49%	0%	67%	0%	90%
Vol Right, %	0%	8%	0%	51%	0%	33%	0%	10%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	69	173	40	70	11	30	29	314
LT Vol	69	0	40	0	11	0	29	0
Through Vol	0	160	0	34	0	20	0	283
RT Vol	0	13	0	36	0	10	0	31
Lane Flow Rate	75	188	43	76	12	33	32	341
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.122	0.276	0.081	0.121	0.023	0.055	0.05	0.49
Departure Headway (Hd)	5.837	5.28	6.709	5.738	6.852	6.108	5.741	5.169
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	609	675	537	618	525	590	619	693
Service Time	3.619	3.062	4.409	3.537	4.553	3.809	3.517	2.944
HCM Lane V/C Ratio	0.123	0.279	0.08	0.123	0.023	0.056	0.052	0.492
HCM Control Delay	9.4	10.1	10	9.3	9.7	9.2	8.8	12.9
HCM Lane LOS	A	B	A	A	A	A	A	B
HCM 95th-tile Q	0.4	1.1	0.3	0.4	0.1	0.2	0.2	2.7

Intersection	
Intersection Delay, s/veh	16.6
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	86	110	20	95	146	18	14	197	89	16	200	143
Future Vol, veh/h	86	110	20	95	146	18	14	197	89	16	200	143
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	91	116	21	100	154	19	15	207	94	17	211	151
Number of Lanes	1	1	0	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	12.7	13.3	17.6	20.5
HCM LOS	B	B	C	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%
Vol Thru, %	0%	69%	0%	85%	0%	89%	0%	58%
Vol Right, %	0%	31%	0%	15%	0%	11%	0%	42%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	14	286	86	130	95	164	16	343
LT Vol	14	0	86	0	95	0	16	0
Through Vol	0	197	0	110	0	146	0	200
RT Vol	0	89	0	20	0	18	0	143
Lane Flow Rate	15	301	91	137	100	173	17	361
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.031	0.563	0.199	0.276	0.216	0.345	0.034	0.657
Departure Headway (Hd)	7.468	6.733	7.895	7.271	7.789	7.198	7.356	6.548
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	479	536	454	493	460	499	487	552
Service Time	5.215	4.481	5.653	5.029	5.545	4.953	5.102	4.293
HCM Lane V/C Ratio	0.031	0.562	0.2	0.278	0.217	0.347	0.035	0.654
HCM Control Delay	10.5	17.9	12.6	12.8	12.7	13.7	10.4	21
HCM Lane LOS	B	C	B	B	B	B	B	C
HCM 95th-tile Q	0.1	3.5	0.7	1.1	0.8	1.5	0.1	4.8

Intersection	
Intersection Delay, s/veh	9.4
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	116	69	11	11	52	11	18	59	11	23	107	140
Future Vol, veh/h	116	69	11	11	52	11	18	59	11	23	107	140
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	122	73	12	12	55	12	19	62	12	24	113	147
Number of Lanes	1	1	0	0	1	0	0	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	1	2
HCM Control Delay	9.8	9.5	9.6	9.1
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1	SBLn1	SBLn2
Vol Left, %	20%	100%	0%	15%	18%	0%
Vol Thru, %	67%	0%	86%	70%	82%	0%
Vol Right, %	12%	0%	14%	15%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	88	116	80	74	130	140
LT Vol	18	116	0	11	23	0
Through Vol	59	0	69	52	107	0
RT Vol	11	0	11	11	0	140
Lane Flow Rate	93	122	84	78	137	147
Geometry Grp	6	7	7	6	7	7
Degree of Util (X)	0.144	0.204	0.127	0.122	0.208	0.192
Departure Headway (Hd)	5.581	6.013	5.412	5.644	5.475	4.681
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	637	593	657	629	653	762
Service Time	3.658	3.789	3.188	3.731	3.236	2.442
HCM Lane V/C Ratio	0.146	0.206	0.128	0.124	0.21	0.193
HCM Control Delay	9.6	10.3	9	9.5	9.7	8.6
HCM Lane LOS	A	B	A	A	A	A
HCM 95th-tile Q	0.5	0.8	0.4	0.4	0.8	0.7

timing, (*b*) the effect of using a roundabout as a segment boundary, (*c*) the effect of midsegment parking maneuvers on facility operation, and (*d*) the use of simulated vehicle trajectories to evaluate the proportion of time that the back of the queue on the minor-street approach to a two-way STOP-controlled intersection exceeds a specified distance from the stop line.

GENERALIZED DAILY SERVICE VOLUMES FOR URBAN STREET FACILITIES

Generalized daily service volume tables provide a means to assess a large number of urban streets in a region or jurisdiction quickly to determine which facilities need to be assessed more carefully (by using operational analysis) to ameliorate existing or pending problems.

To build a generalized daily service volume table for urban street facilities, a number of simplifying assumptions must be made. The assumptions made here include the following:

- All segments of the facility have the same number of through lanes (one, two, or three) in each direction;
- Only traffic signal control is used along the facility (i.e., no roundabouts or all-way STOP-controlled intersections exist);
- The traffic signals are coordinated and semi-actuated, the arrival type is 4, the traffic signal cycle time C is 120 s, and the weighted average green-to-cycle-length (g/C) ratio for through movements (defined below) is 0.45;
- Exclusive left-turn lanes with protected left-turn phasing and adequate queue storage are provided at each signalized intersection, and no exclusive right-turn lanes are provided;
- At each traffic signal, 10% of the traffic on the urban street facility turns left and 10% turns right;
- The peak hour factor is 0.92;
- The facility length is 2 mi, and no restrictive medians exist along the facility; and
- The base saturation flow rate s_o is 1,900 passenger cars per hour per lane (pc/h/ln).

The weighted average g/C ratio of an urban street is the average of the critical intersection through g/C ratio and the average of all the other g/C ratios for the urban street. For example, if there are four signals with a through g/C ratio of 0.50 and one signal with a through g/C ratio of 0.40, the weighted average g/C ratio for the urban street is 0.45. The weighted g/C ratio takes into account the adverse effect of the critical intersection and the overall quality of flow for the urban street.

Generalized daily service volumes are provided in Exhibit 16-14 for urban street facilities with posted speeds of 30 and 45 mi/h; two, four, or six lanes (both directions); and six combinations of the K-factor and D-factor. To use this table, analysts must select a combination of K and D appropriate for their locality.

The 30-mi/h values further assume an average traffic signal spacing of 1,050 ft and 20 access points/mi, while the 45-mi/h values assume an average traffic signal spacing of 1,500 ft and 10 access points/mi.

Exhibit 16-14
Generalized Daily Service Volumes for Urban Street Facilities (1,000 veh/day)

K-Factor	*D*-Factor	Two-Lane Streets				Four-Lane Streets				Six-Lane Streets			
		LOS B	LOS C	LOS D	LOS E	LOS B	LOS C	LOS D	LOS E	LOS B	LOS C	LOS D	LOS E
Posted Speed = 30 mi/h													
0.09	0.55	NA	5.9	15.4	19.9	NA	11.3	31.4	37.9	NA	16.3	46.4	54.3
	0.60	NA	5.4	14.1	18.3	NA	10.3	28.8	34.8	NA	15.0	42.5	49.8
0.10	0.55	NA	5.3	13.8	17.9	NA	10.1	28.2	34.1	NA	14.7	41.8	48.9
	0.60	NA	4.8	12.7	16.4	NA	9.3	25.9	31.3	NA	13.5	38.3	44.8
0.11	0.55	NA	4.8	12.6	16.3	NA	9.2	25.7	31.0	NA	13.4	38.0	44.5
	0.60	NA	4.4	11.5	14.9	NA	8.4	23.5	28.4	NA	12.2	34.8	40.8
Posted Speed = 45 mi/h													
0.09	0.55	NA	10.3	18.6	19.9	NA	21.4	37.2	37.9	NA	31.9	54.0	54.3
	0.60	NA	9.4	17.1	18.3	NA	19.6	34.1	34.8	NA	29.2	49.5	49.8
0.10	0.55	NA	9.3	16.8	17.9	NA	19.3	33.5	34.1	NA	28.7	48.6	48.9
	0.60	NA	8.5	15.4	16.4	NA	17.7	30.7	31.3	NA	26.3	44.5	44.8
0.11	0.55	NA	8.4	15.3	16.3	NA	17.5	30.5	31.0	NA	26.1	44.2	44.4
	0.60	NA	7.7	14.0	14.9	NA	16.1	27.9	28.4	NA	23.9	40.5	40.7

Notes: NA = not applicable; LOS cannot be achieved with the stated assumptions.
General assumptions include no roundabouts or all-way STOP-controlled intersections along the facility; coordinated, semi-actuated traffic signals; arrival type 4; 120-s cycle time; protected left-turn phases; 0.45 weighted average *g/C* ratio; exclusive left-turn lanes with adequate queue storage provided at traffic signals; no exclusive right-turn lanes provided; no restrictive median; 2-mi facility length; 10% of traffic turns left and 10% turns right at each traffic signal; peak hour factor = 0.92; and base saturation flow rate = 1,900 pc/h/ln.
Additional assumptions for 30-mi/h facilities: signal spacing = 1,050 ft and 20 access points/mi.
Additional assumptions for 45-mi/h facilities: signal spacing = 1,500 ft and 10 access points/mi.

Exhibit 16-14 is provided for general planning use and should *not* be used to analyze any specific urban street facility or to make final decisions on important design features. A full operational analysis using this chapter's methodology is required for such specific applications.

The exhibit is useful, however, in evaluating the overall performance of a large number of urban streets within a jurisdiction, as a first pass to determine where problems might exist or arise, or to determine where improvements might be needed. Any urban street identified as likely to experience problems or need improvement, however, should then be subjected to a full operational analysis before any decisions on implementing specific improvements are made.

Daily service volumes are strongly affected by the *K*- and *D*-factors chosen as typical for the analysis. It is important that the values used for the facilities under study be reasonable. Also, if any characteristic is significantly different from the typical values used to develop Exhibit 16-14, particularly the weighted average *g/C* ratio and traffic signal spacing, the values taken from this exhibit will not be representative of the study facilities. In such cases, analysts are advised to develop their own generalized service volume tables by using representative local values or to proceed to a full operational analysis.

ACTIVE TRAFFIC MANAGEMENT STRATEGIES

Active traffic management (ATM) consists of the dynamic and continuous monitoring and control of traffic operations on a facility to improve facility performance. Examples of ATM measures on urban streets include congestion pricing zones, adaptive/responsive signal control, demand metering, changeable

Appendix B

Future Year 2040 LOS Calculations

Intersection	
Int Delay, s/veh	5.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	36	4	46	52	86	9	216	32	19	185	17
Future Vol, veh/h	6	36	4	46	52	86	9	216	32	19	185	17
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	150	-	-	150	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	77	77	77	77	77	77	77	77	77	77	77	77
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	8	47	5	60	68	112	12	281	42	25	240	22

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	717	648	251	653	638	302	262	0	0	323	0	0
Stage 1	301	301	-	326	326	-	-	-	-	-	-	-
Stage 2	416	347	-	327	312	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	347	392	793	383	397	742	1314	-	-	1248	-	-
Stage 1	712	669	-	691	652	-	-	-	-	-	-	-
Stage 2	618	638	-	690	661	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	249	381	793	337	385	742	1314	-	-	1248	-	-
Mov Cap-2 Maneuver	249	381	-	337	385	-	-	-	-	-	-	-
Stage 1	706	656	-	685	646	-	-	-	-	-	-	-
Stage 2	466	632	-	624	648	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.5	15.5	0.3	0.7
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1314	-	-	372	337	550	1248	-	-
HCM Lane V/C Ratio	0.009	-	-	0.161	0.177	0.326	0.02	-	-
HCM Control Delay (s)	7.8	-	-	16.5	18	14.7	7.9	0	-
HCM Lane LOS	A	-	-	C	C	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.6	0.6	1.4	0.1	-	-

Intersection	
Intersection Delay, s/veh	9.3
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	11	66	23	15	17	45	6	116	75	60	95	3
Future Vol, veh/h	11	66	23	15	17	45	6	116	75	60	95	3
Peak Hour Factor	0.92	0.92	0.92	0.88	0.92	0.88	0.92	0.88	0.88	0.88	0.88	0.92
Heavy Vehicles, %	0	0	0	2	0	2	0	2	2	2	2	0
Mvmt Flow	12	72	25	17	18	51	7	132	85	68	108	3
Number of Lanes	1	1	0	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	9.1	8.6	9.8	9.1
HCM LOS	A	A	A	A

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%
Vol Thru, %	0%	61%	0%	74%	0%	27%	0%	97%
Vol Right, %	0%	39%	0%	26%	0%	73%	0%	3%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	6	191	11	89	15	62	60	98
LT Vol	6	0	11	0	15	0	60	0
Through Vol	0	116	0	66	0	17	0	95
RT Vol	0	75	0	23	0	45	0	3
Lane Flow Rate	7	217	12	97	17	70	68	111
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.01	0.299	0.02	0.146	0.029	0.099	0.109	0.162
Departure Headway (Hd)	5.703	4.958	6.107	5.421	6.176	5.125	5.76	5.236
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	626	723	584	658	577	695	620	682
Service Time	3.455	2.71	3.868	3.181	3.939	2.887	3.515	2.99
HCM Lane V/C Ratio	0.011	0.3	0.021	0.147	0.029	0.101	0.11	0.163
HCM Control Delay	8.5	9.8	9	9.1	9.1	8.5	9.2	9
HCM Lane LOS	A	A	A	A	A	A	A	A
HCM 95th-tile Q	0	1.3	0.1	0.5	0.1	0.3	0.4	0.6

Intersection	
Intersection Delay, s/veh	17.9
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	31	24	5	30	9	80	3	273	227	123	99	9
Future Vol, veh/h	31	24	5	30	9	80	3	273	227	123	99	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	34	26	5	33	10	87	3	297	247	134	108	10
Number of Lanes	0	1	0	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	1
HCM Control Delay	11	10.1	24	10.4
HCM LOS	B	B	C	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	52%	100%	0%	100%	0%
Vol Thru, %	0%	55%	40%	0%	10%	0%	92%
Vol Right, %	0%	45%	8%	0%	90%	0%	8%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	3	500	60	30	89	123	108
LT Vol	3	0	31	30	0	123	0
Through Vol	0	273	24	0	9	0	99
RT Vol	0	227	5	0	80	0	9
Lane Flow Rate	3	543	65	33	97	134	117
Geometry Grp	7	7	6	7	7	7	7
Degree of Util (X)	0.005	0.783	0.126	0.066	0.164	0.234	0.187
Departure Headway (Hd)	6.011	5.186	6.951	7.243	6.095	6.291	5.725
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	596	701	515	494	587	571	627
Service Time	3.74	2.914	5.004	4.989	3.841	4.027	3.461
HCM Lane V/C Ratio	0.005	0.775	0.126	0.067	0.165	0.235	0.187
HCM Control Delay	8.8	24.1	11	10.5	10	10.9	9.8
HCM Lane LOS	A	C	B	B	A	B	A
HCM 95th-tile Q	0	7.7	0.4	0.2	0.6	0.9	0.7

Intersection	
Int Delay, s/veh	2.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	24	29	6	4	9	50	3	416	3	21	109	4
Future Vol, veh/h	24	29	6	4	9	50	3	416	3	21	109	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	26	32	7	4	10	54	3	452	3	23	118	4

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	658	627	120	646	628	454	122	0	0	455	0	0
Stage 1	166	166	-	460	460	-	-	-	-	-	-	-
Stage 2	492	461	-	186	168	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	378	400	931	385	400	606	1465	-	-	1106	-	-
Stage 1	836	761	-	581	566	-	-	-	-	-	-	-
Stage 2	558	565	-	816	759	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	331	390	931	352	390	606	1465	-	-	1106	-	-
Mov Cap-2 Maneuver	331	390	-	352	390	-	-	-	-	-	-	-
Stage 1	833	744	-	579	564	-	-	-	-	-	-	-
Stage 2	498	563	-	759	742	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.2	12.6	0.1	1.3
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1465	-	-	385	539	1106	-	-
HCM Lane V/C Ratio	0.002	-	-	0.167	0.127	0.021	-	-
HCM Control Delay (s)	7.5	0	-	16.2	12.6	8.3	0	-
HCM Lane LOS	A	A	-	C	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.6	0.4	0.1	-	-

Intersection	
Intersection Delay, s/veh	14.2
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	30	1	204	43	220	1	133	74	83	10	2
Future Vol, veh/h	10	30	1	204	43	220	1	133	74	83	10	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	33	1	222	47	239	1	145	80	90	11	2
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	9.1	16.9	11	10.1
HCM LOS	A	C	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	24%	44%	87%
Vol Thru, %	64%	73%	9%	11%
Vol Right, %	36%	2%	47%	2%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	208	41	467	95
LT Vol	1	10	204	83
Through Vol	133	30	43	10
RT Vol	74	1	220	2
Lane Flow Rate	226	45	508	103
Geometry Grp	1	1	1	1
Degree of Util (X)	0.333	0.07	0.671	0.169
Departure Headway (Hd)	5.304	5.615	4.76	5.876
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	678	637	761	610
Service Time	3.342	3.656	2.76	3.919
HCM Lane V/C Ratio	0.333	0.071	0.668	0.169
HCM Control Delay	11	9.1	16.9	10.1
HCM Lane LOS	B	A	C	B
HCM 95th-tile Q	1.5	0.2	5.2	0.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	25	17	62	99	54	49	234	24	40	217	53
Future Volume (veh/h)	14	25	17	62	99	54	49	234	24	40	217	53
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	18	31	21	78	124	68	61	292	30	50	271	66
Adj No. of Lanes	1	1	1	1	1	0	0	2	0	1	1	0
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	41	229	195	132	197	108	282	1214	124	607	681	166
Arrive On Green	0.02	0.12	0.12	0.07	0.17	0.17	0.46	0.46	0.46	0.46	0.46	0.46
Sat Flow, veh/h	1810	1900	1615	1810	1155	633	350	2634	269	1075	1477	360
Grp Volume(v), veh/h	18	31	21	78	0	192	195	0	188	50	0	337
Grp Sat Flow(s),veh/h/ln	1810	1900	1615	1810	0	1788	1572	0	1682	1075	0	1837
Q Serve(g_s), s	0.4	0.6	0.5	1.6	0.0	3.9	0.1	0.0	2.6	1.2	0.0	4.7
Cycle Q Clear(g_c), s	0.4	0.6	0.5	1.6	0.0	3.9	4.8	0.0	2.6	3.8	0.0	4.7
Prop In Lane	1.00		1.00	1.00		0.35	0.31		0.16	1.00		0.20
Lane Grp Cap(c), veh/h	41	229	195	132	0	306	845	0	775	607	0	846
V/C Ratio(X)	0.44	0.14	0.11	0.59	0.00	0.63	0.23	0.00	0.24	0.08	0.00	0.40
Avail Cap(c_a), veh/h	232	875	744	255	0	847	845	0	775	607	0	846
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	18.8	15.4	15.3	17.5	0.0	15.0	6.3	0.0	6.4	7.5	0.0	7.0
Incr Delay (d2), s/veh	7.2	0.3	0.2	4.1	0.0	2.1	0.6	0.0	0.7	0.3	0.0	1.4
Initial Q Delay(d3),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
%ile BackOfQ(50%),veh/ln	0.3	0.3	0.2	1.0	0.0	2.1	1.4	0.0	1.4	0.4	0.0	2.7
LnGrp Delay(d),s/veh	26.0	15.6	15.5	21.7	0.0	17.2	7.0	0.0	7.1	7.8	0.0	8.4
LnGrp LOS	C	B	B	C		B	A		A	A		A
Approach Vol, veh/h		70			270			383			387	
Approach Delay, s/veh		18.3			18.5			7.1			8.3	
Approach LOS		B			B			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		22.5	7.4	9.2		22.5	5.4	11.2
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		18.0	5.5	18.0		18.0	5.0	18.5
Max Q Clear Time (g_c+I1), s		6.8	3.6	2.6		6.7	2.4	5.9
Green Ext Time (p_c), s		1.7	0.0	0.1		1.7	0.0	0.8

Intersection Summary	
HCM 2010 Ctrl Delay	11.0
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	70	99	7	59	9	25	146	3	11	207	34
Future Volume (veh/h)	38	70	99	7	59	9	25	146	3	11	207	34
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	40	74	104	7	62	9	26	154	3	12	218	36
Adj No. of Lanes	1	1	1	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	232	209	178	222	179	26	818	1169	23	902	978	161
Arrive On Green	0.11	0.11	0.11	0.11	0.11	0.11	0.03	0.63	0.63	0.02	0.61	0.61
Sat Flow, veh/h	1350	1900	1615	1225	1623	236	1810	1857	36	1810	1591	263
Grp Volume(v), veh/h	40	74	104	7	0	71	26	0	157	12	0	254
Grp Sat Flow(s),veh/h/ln	1350	1900	1615	1225	0	1858	1810	0	1894	1810	0	1854
Q Serve(g_s), s	1.6	2.0	3.4	0.3	0.0	1.9	0.3	0.0	1.8	0.1	0.0	3.4
Cycle Q Clear(g_c), s	3.5	2.0	3.4	2.3	0.0	1.9	0.3	0.0	1.8	0.1	0.0	3.4
Prop In Lane	1.00		1.00	1.00		0.13	1.00		0.02	1.00		0.14
Lane Grp Cap(c), veh/h	232	209	178	222	0	205	818	0	1191	902	0	1139
V/C Ratio(X)	0.17	0.35	0.58	0.03	0.00	0.35	0.03	0.00	0.13	0.01	0.00	0.22
Avail Cap(c_a), veh/h	525	622	529	488	0	608	928	0	1191	1039	0	1139
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	24.3	22.7	23.3	23.7	0.0	22.6	3.6	0.0	4.1	3.8	0.0	4.7
Incr Delay (d2), s/veh	0.3	1.0	3.0	0.1	0.0	1.0	0.0	0.0	0.2	0.0	0.0	0.5
Initial Q Delay(d3),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
%ile BackOfQ(50%),veh/ln	0.6	1.1	1.7	0.1	0.0	1.0	0.1	0.0	1.0	0.1	0.0	1.8
LnGrp Delay(d),s/veh	24.6	23.7	26.3	23.8	0.0	23.6	3.6	0.0	4.4	3.8	0.0	5.2
LnGrp LOS	C	C	C	C		C	A		A	A		A
Approach Vol, veh/h		218			78			183			266	
Approach Delay, s/veh		25.1			23.7			4.3			5.1	
Approach LOS		C			C			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.3	39.1		10.6	6.1	38.3		10.6
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	5.0	18.5		18.0	5.0	18.5		18.0
Max Q Clear Time (g_c+I1), s	2.1	3.8		5.5	2.3	5.4		4.3
Green Ext Time (p_c), s	0.0	0.6		0.6	0.0	1.2		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	12.7
HCM 2010 LOS	B

Intersection	
Intersection Delay, s/veh	9.7
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	23	22	23	19	49	36	35	176	10	18	170	34
Future Vol, veh/h	23	22	23	19	49	36	35	176	10	18	170	34
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	24	23	24	20	52	38	37	185	11	19	179	36
Number of Lanes	1	1	0	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	8.9	9.1	9.8	10
HCM LOS	A	A	A	A

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%
Vol Thru, %	0%	95%	0%	49%	0%	58%	0%	83%
Vol Right, %	0%	5%	0%	51%	0%	42%	0%	17%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	35	186	23	45	19	85	18	204
LT Vol	35	0	23	0	19	0	18	0
Through Vol	0	176	0	22	0	49	0	170
RT Vol	0	10	0	23	0	36	0	34
Lane Flow Rate	37	196	24	47	20	89	19	215
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.059	0.282	0.042	0.072	0.035	0.135	0.03	0.305
Departure Headway (Hd)	5.72	5.179	6.304	5.438	6.252	5.448	5.726	5.106
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	624	691	565	654	570	654	623	700
Service Time	3.478	2.936	4.081	3.214	4.023	3.219	3.484	2.863
HCM Lane V/C Ratio	0.059	0.284	0.042	0.072	0.035	0.136	0.03	0.307
HCM Control Delay	8.8	10	9.4	8.6	9.3	9.1	8.7	10.1
HCM Lane LOS	A	A	A	A	A	A	A	B
HCM 95th-tile Q	0.2	1.2	0.1	0.2	0.1	0.5	0.1	1.3

Intersection	
Intersection Delay, s/veh	12
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	97	109	23	57	106	13	18	149	75	12	126	79
Future Vol, veh/h	97	109	23	57	106	13	18	149	75	12	126	79
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	109	122	26	64	119	15	20	167	84	13	142	89
Number of Lanes	1	1	0	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	11.3	11.1	12.9	12.4
HCM LOS	B	B	B	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%
Vol Thru, %	0%	67%	0%	83%	0%	89%	0%	61%
Vol Right, %	0%	33%	0%	17%	0%	11%	0%	39%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	18	224	97	132	57	119	12	205
LT Vol	18	0	97	0	57	0	12	0
Through Vol	0	149	0	109	0	106	0	126
RT Vol	0	75	0	23	0	13	0	79
Lane Flow Rate	20	252	109	148	64	134	13	230
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.038	0.422	0.209	0.258	0.124	0.238	0.026	0.387
Departure Headway (Hd)	6.786	6.04	6.888	6.257	6.994	6.408	6.834	6.052
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	526	594	519	571	510	558	522	592
Service Time	4.55	3.804	4.654	4.022	4.763	4.177	4.599	3.816
HCM Lane V/C Ratio	0.038	0.424	0.21	0.259	0.125	0.24	0.025	0.389
HCM Control Delay	9.8	13.2	11.5	11.2	10.8	11.2	9.8	12.6
HCM Lane LOS	A	B	B	B	B	B	A	B
HCM 95th-tile Q	0.1	2.1	0.8	1	0.4	0.9	0.1	1.8

Intersection	
Intersection Delay, s/veh	8.5
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	63	28	5	36	25	13	9	45	2	3	61	103
Future Vol, veh/h	63	28	5	36	25	13	9	45	2	3	61	103
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	71	31	6	40	28	15	10	51	2	3	69	116
Number of Lanes	1	1	0	0	1	0	0	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	1	2
HCM Control Delay	8.8	9	8.8	8
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1	SBLn1	SBLn2
Vol Left, %	16%	100%	0%	49%	5%	0%
Vol Thru, %	80%	0%	85%	34%	95%	0%
Vol Right, %	4%	0%	15%	18%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	56	63	33	74	64	103
LT Vol	9	63	0	36	3	0
Through Vol	45	0	28	25	61	0
RT Vol	2	0	5	13	0	103
Lane Flow Rate	63	71	37	83	72	116
Geometry Grp	6	7	7	6	7	7
Degree of Util (X)	0.091	0.112	0.052	0.121	0.102	0.141
Departure Headway (Hd)	5.234	5.682	5.073	5.228	5.1	4.373
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	685	631	706	685	703	821
Service Time	3.267	3.415	2.805	3.261	2.826	2.099
HCM Lane V/C Ratio	0.092	0.113	0.052	0.121	0.102	0.141
HCM Control Delay	8.8	9.1	8.1	9	8.4	7.8
HCM Lane LOS	A	A	A	A	A	A
HCM 95th-tile Q	0.3	0.4	0.2	0.4	0.3	0.5

Intersection	
Int Delay, s/veh	2.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	4	1	44	4	57	1	267	78	44	258	2
Future Vol, veh/h	4	4	1	44	4	57	1	267	78	44	258	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	150	-	-	150	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	82	82	82	82	82	82	82	82	82
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	5	5	1	54	5	70	1	326	95	54	315	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	837	847	316	803	801	374	317	0	0	421	0	0
Stage 1	424	424	-	376	376	-	-	-	-	-	-	-
Stage 2	413	423	-	427	425	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	288	301	729	304	320	677	1255	-	-	1149	-	-
Stage 1	612	590	-	649	620	-	-	-	-	-	-	-
Stage 2	620	591	-	610	590	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	246	287	729	289	305	677	1255	-	-	1149	-	-
Mov Cap-2 Maneuver	246	287	-	289	305	-	-	-	-	-	-	-
Stage 1	611	562	-	648	619	-	-	-	-	-	-	-
Stage 2	552	590	-	575	562	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	18.1	15.2	0	1.2
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1255	-	-	285	289	627	1149	-	-
HCM Lane V/C Ratio	0.001	-	-	0.039	0.186	0.119	0.047	-	-
HCM Control Delay (s)	7.9	-	-	18.1	20.3	11.5	8.3	0	-
HCM Lane LOS	A	-	-	C	C	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.7	0.4	0.1	-	-

Intersection	
Intersection Delay, s/veh	10.6
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	35	12	58	65	67	22	153	36	100	216	11
Future Vol, veh/h	6	35	12	58	65	67	22	153	36	100	216	11
Peak Hour Factor	0.92	0.92	0.92	0.96	0.92	0.96	0.92	0.96	0.96	0.96	0.96	0.92
Heavy Vehicles, %	0	0	0	2	0	2	0	2	2	2	2	0
Mvmt Flow	7	38	13	60	71	70	24	159	38	104	225	12
Number of Lanes	1	1	0	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	9.5	10.1	10.6	11.1
HCM LOS	A	B	B	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%
Vol Thru, %	0%	81%	0%	74%	0%	49%	0%	95%
Vol Right, %	0%	19%	0%	26%	0%	51%	0%	5%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	22	189	6	47	58	132	100	227
LT Vol	22	0	6	0	58	0	100	0
Through Vol	0	153	0	35	0	65	0	216
RT Vol	0	36	0	12	0	67	0	11
Lane Flow Rate	24	197	7	51	60	140	104	237
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.041	0.307	0.012	0.087	0.111	0.224	0.176	0.367
Departure Headway (Hd)	6.215	5.61	6.853	6.164	6.637	5.737	6.091	5.575
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	577	642	523	581	541	626	591	649
Service Time	3.942	3.336	4.589	3.9	4.366	3.466	3.813	3.275
HCM Lane V/C Ratio	0.042	0.307	0.013	0.088	0.111	0.224	0.176	0.365
HCM Control Delay	9.2	10.8	9.7	9.5	10.2	10.1	10.1	11.5
HCM Lane LOS	A	B	A	A	B	B	B	B
HCM 95th-tile Q	0.1	1.3	0	0.3	0.4	0.9	0.6	1.7

Intersection	
Intersection Delay, s/veh	19.1
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	17	20	4	56	28	147	6	234	204	214	235	32
Future Vol, veh/h	17	20	4	56	28	147	6	234	204	214	235	32
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	18	22	4	61	30	160	7	254	222	233	255	35
Number of Lanes	0	1	0	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	1
HCM Control Delay	11.9	12.7	27.8	14.8
HCM LOS	B	B	D	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	41%	100%	0%	100%	0%
Vol Thru, %	0%	53%	49%	0%	16%	0%	88%
Vol Right, %	0%	47%	10%	0%	84%	0%	12%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	6	438	41	56	175	214	267
LT Vol	6	0	17	56	0	214	0
Through Vol	0	234	20	0	28	0	235
RT Vol	0	204	4	0	147	0	32
Lane Flow Rate	7	476	45	61	190	233	290
Geometry Grp	7	7	6	7	7	7	7
Degree of Util (X)	0.012	0.793	0.099	0.131	0.351	0.436	0.497
Departure Headway (Hd)	6.835	5.995	8.02	7.754	6.643	6.753	6.159
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	521	600	450	460	538	530	580
Service Time	4.613	3.773	6.02	5.544	4.431	4.532	3.938
HCM Lane V/C Ratio	0.013	0.793	0.1	0.133	0.353	0.44	0.5
HCM Control Delay	9.7	28	11.9	11.7	13	14.7	14.9
HCM Lane LOS	A	D	B	B	B	B	B
HCM 95th-tile Q	0	7.7	0.3	0.4	1.6	2.2	2.8

Intersection	
Int Delay, s/veh	4.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	11	15	2	9	36	108	6	330	5	51	196	19
Future Vol, veh/h	11	15	2	9	36	108	6	330	5	51	196	19
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	12	16	2	10	39	117	7	359	5	55	213	21

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	788	712	224	719	720	362	234	0	0	364	0	0
Stage 1	334	334	-	376	376	-	-	-	-	-	-	-
Stage 2	454	378	-	343	344	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	309	358	815	344	354	683	1333	-	-	1195	-	-
Stage 1	680	643	-	645	616	-	-	-	-	-	-	-
Stage 2	586	615	-	672	637	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	222	337	815	315	333	683	1333	-	-	1195	-	-
Mov Cap-2 Maneuver	222	337	-	315	333	-	-	-	-	-	-	-
Stage 1	675	609	-	640	612	-	-	-	-	-	-	-
Stage 2	451	611	-	618	603	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	18.9	15.2	0.1	1.6
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1333	-	-	290	519	1195	-	-
HCM Lane V/C Ratio	0.005	-	-	0.105	0.32	0.046	-	-
HCM Control Delay (s)	7.7	0	-	18.9	15.2	8.2	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.3	1.4	0.1	-	-

Intersection	
Intersection Delay, s/veh	12.5
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	16	35	1	160	47	178	1	95	68	176	15	7
Future Vol, veh/h	16	35	1	160	47	178	1	95	68	176	15	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	17	38	1	174	51	193	1	103	74	191	16	8
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	9.4	14.5	10.2	11.5
HCM LOS	A	B	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	1%	31%	42%	89%
Vol Thru, %	58%	67%	12%	8%
Vol Right, %	41%	2%	46%	4%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	164	52	385	198
LT Vol	1	16	160	176
Through Vol	95	35	47	15
RT Vol	68	1	178	7
Lane Flow Rate	178	57	418	215
Geometry Grp	1	1	1	1
Degree of Util (X)	0.263	0.09	0.576	0.337
Departure Headway (Hd)	5.304	5.73	4.959	5.629
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	676	623	732	637
Service Time	3.348	3.78	2.959	3.671
HCM Lane V/C Ratio	0.263	0.091	0.571	0.338
HCM Control Delay	10.2	9.4	14.5	11.5
HCM Lane LOS	B	A	B	B
HCM 95th-tile Q	1.1	0.3	3.7	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	83	149	57	40	22	66	15	313	42	72	190	9
Future Volume (veh/h)	83	149	57	40	22	66	15	313	42	72	190	9
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	89	160	61	43	24	71	16	337	45	77	204	10
Adj No. of Lanes	1	1	1	1	1	0	0	2	0	1	1	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	143	295	251	86	53	156	119	1405	182	575	818	40
Arrive On Green	0.08	0.16	0.16	0.05	0.12	0.12	0.46	0.46	0.46	0.46	0.46	0.46
Sat Flow, veh/h	1810	1900	1615	1810	424	1255	46	3086	399	1017	1796	88
Grp Volume(v), veh/h	89	160	61	43	0	95	211	0	187	77	0	214
Grp Sat Flow(s),veh/h/ln	1810	1900	1615	1810	0	1679	1872	0	1659	1017	0	1884
Q Serve(g_s), s	1.9	3.1	1.3	0.9	0.0	2.1	0.0	0.0	2.7	2.0	0.0	2.8
Cycle Q Clear(g_c), s	1.9	3.1	1.3	0.9	0.0	2.1	2.7	0.0	2.7	4.7	0.0	2.8
Prop In Lane	1.00		1.00	1.00		0.75	0.08		0.24	1.00		0.05
Lane Grp Cap(c), veh/h	143	295	251	86	0	208	951	0	755	575	0	858
V/C Ratio(X)	0.62	0.54	0.24	0.50	0.00	0.46	0.22	0.00	0.25	0.13	0.00	0.25
Avail Cap(c_a), veh/h	252	865	736	252	0	765	951	0	755	575	0	858
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	17.6	15.4	14.7	18.4	0.0	16.1	6.6	0.0	6.6	8.1	0.0	6.6
Incr Delay (d2), s/veh	4.4	1.5	0.5	4.4	0.0	1.6	0.5	0.0	0.8	0.5	0.0	0.7
Initial Q Delay(d3),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
%ile BackOfQ(50%),veh/ln	1.1	1.7	0.6	0.6	0.0	1.0	1.5	0.0	1.4	0.6	0.0	1.6
LnGrp Delay(d),s/veh	22.0	16.9	15.1	22.8	0.0	17.6	7.1	0.0	7.4	8.5	0.0	7.3
LnGrp LOS	C	B	B	C		B	A		A	A		A
Approach Vol, veh/h		310			138			398			291	
Approach Delay, s/veh		18.0			19.2			7.3			7.6	
Approach LOS		B			B			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		22.5	6.4	10.6		22.5	7.6	9.4
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		18.0	5.5	18.0		18.0	5.5	18.0
Max Q Clear Time (g_c+I1), s		4.7	2.9	5.1		6.7	3.9	4.1
Green Ext Time (p_c), s		1.9	0.0	0.8		1.2	0.0	0.3

Intersection Summary	
HCM 2010 Ctrl Delay	11.7
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	17	105	28	44	39	44	6	238	61	105	309	41
Future Volume (veh/h)	17	105	28	44	39	44	6	238	61	105	309	41
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	19	115	31	48	43	48	7	262	67	115	340	45
Adj No. of Lanes	1	1	1	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	246	256	217	230	111	123	664	796	203	742	1004	133
Arrive On Green	0.13	0.13	0.13	0.13	0.13	0.13	0.01	0.54	0.54	0.08	0.61	0.61
Sat Flow, veh/h	1326	1900	1615	1262	821	917	1810	1461	374	1810	1644	218
Grp Volume(v), veh/h	19	115	31	48	0	91	7	0	329	115	0	385
Grp Sat Flow(s),veh/h/ln	1326	1900	1615	1262	0	1738	1810	0	1834	1810	0	1862
Q Serve(g_s), s	0.7	3.1	0.9	2.0	0.0	2.6	0.1	0.0	5.5	1.3	0.0	5.6
Cycle Q Clear(g_c), s	3.4	3.1	0.9	5.1	0.0	2.6	0.1	0.0	5.5	1.3	0.0	5.6
Prop In Lane	1.00		1.00	1.00		0.53	1.00		0.20	1.00		0.12
Lane Grp Cap(c), veh/h	246	256	217	230	0	234	664	0	999	742	0	1137
V/C Ratio(X)	0.08	0.45	0.14	0.21	0.00	0.39	0.01	0.00	0.33	0.15	0.00	0.34
Avail Cap(c_a), veh/h	502	622	529	473	0	569	812	0	999	787	0	1137
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	23.3	21.9	21.0	24.3	0.0	21.7	5.5	0.0	6.9	4.2	0.0	5.3
Incr Delay (d2), s/veh	0.1	1.2	0.3	0.4	0.0	1.1	0.0	0.0	0.9	0.1	0.0	0.8
Initial Q Delay(d3),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
%ile BackOfQ(50%),veh/ln	0.3	1.7	0.4	0.7	0.0	1.3	0.0	0.0	3.0	0.7	0.0	3.0
LnGrp Delay(d),s/veh	23.4	23.2	21.3	24.7	0.0	22.8	5.5	0.0	7.8	4.3	0.0	6.1
LnGrp LOS	C	C	C	C		C	A		A	A		A
Approach Vol, veh/h		165			139			336			500	
Approach Delay, s/veh		22.8			23.4			7.8			5.7	
Approach LOS		C			C			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.6	34.5		11.9	5.0	38.1		11.9
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	5.5	18.0		18.0	5.0	18.5		18.0
Max Q Clear Time (g_c+I1), s	3.3	7.5		5.4	2.1	7.6		7.1
Green Ext Time (p_c), s	0.0	1.4		0.5	0.0	1.7		0.4

Intersection Summary	
HCM 2010 Ctrl Delay	10.9
HCM 2010 LOS	B

Intersection	
Intersection Delay, s/veh	12.1
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	44	38	40	12	22	11	76	177	14	32	313	34
Future Vol, veh/h	44	38	40	12	22	11	76	177	14	32	313	34
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	48	41	43	13	24	12	83	192	15	35	340	37
Number of Lanes	1	1	0	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	10	9.6	10.5	14.3
HCM LOS	A	A	B	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%
Vol Thru, %	0%	93%	0%	49%	0%	67%	0%	90%
Vol Right, %	0%	7%	0%	51%	0%	33%	0%	10%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	76	191	44	78	12	33	32	347
LT Vol	76	0	44	0	12	0	32	0
Through Vol	0	177	0	38	0	22	0	313
RT Vol	0	14	0	40	0	11	0	34
Lane Flow Rate	83	208	48	85	13	36	35	377
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.139	0.317	0.092	0.142	0.026	0.063	0.057	0.563
Departure Headway (Hd)	6.062	5.505	6.902	6.03	7.077	6.331	5.942	5.369
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	594	656	520	595	506	566	606	675
Service Time	3.771	3.215	4.635	3.763	4.815	4.069	3.648	3.075
HCM Lane V/C Ratio	0.14	0.317	0.092	0.143	0.026	0.064	0.058	0.559
HCM Control Delay	9.7	10.8	10.3	9.8	10	9.5	9	14.8
HCM Lane LOS	A	B	B	A	A	A	A	B
HCM 95th-tile Q	0.5	1.4	0.3	0.5	0.1	0.2	0.2	3.5

Intersection	
Intersection Delay, s/veh	22.8
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	107	138	25	105	165	20	15	218	98	16	221	163
Future Vol, veh/h	107	138	25	105	165	20	15	218	98	16	221	163
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	113	145	26	111	174	21	16	229	103	17	233	172
Number of Lanes	1	1	0	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	15.1	15.7	24.4	31.9
HCM LOS	C	C	C	D

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%
Vol Thru, %	0%	69%	0%	85%	0%	89%	0%	58%
Vol Right, %	0%	31%	0%	15%	0%	11%	0%	42%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	15	316	107	163	105	185	16	384
LT Vol	15	0	107	0	105	0	16	0
Through Vol	0	218	0	138	0	165	0	221
RT Vol	0	98	0	25	0	20	0	163
Lane Flow Rate	16	333	113	172	111	195	17	404
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.036	0.688	0.269	0.379	0.262	0.43	0.037	0.798
Departure Headway (Hd)	8.188	7.449	8.589	7.961	8.53	7.945	8.051	7.231
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	439	489	419	453	422	456	447	505
Service Time	5.898	5.159	6.317	5.689	6.257	5.662	5.751	4.931
HCM Lane V/C Ratio	0.036	0.681	0.27	0.38	0.263	0.428	0.038	0.8
HCM Control Delay	11.2	25	14.5	15.5	14.3	16.5	11.1	32.8
HCM Lane LOS	B	C	B	C	B	C	B	D
HCM 95th-tile Q	0.1	5.2	1.1	1.7	1	2.1	0.1	7.4

Intersection	
Intersection Delay, s/veh	10.3
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	147	87	14	12	70	12	24	65	11	25	118	187
Future Vol, veh/h	147	87	14	12	70	12	24	65	11	25	118	187
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	155	92	15	13	74	13	25	68	12	26	124	197
Number of Lanes	1	1	0	0	1	0	0	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	1	2
HCM Control Delay	10.8	10.3	10.4	10
HCM LOS	B	B	B	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1	SBLn1	SBLn2
Vol Left, %	24%	100%	0%	13%	17%	0%
Vol Thru, %	65%	0%	86%	74%	83%	0%
Vol Right, %	11%	0%	14%	13%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	100	147	101	94	143	187
LT Vol	24	147	0	12	25	0
Through Vol	65	0	87	70	118	0
RT Vol	11	0	14	12	0	187
Lane Flow Rate	105	155	106	99	151	197
Geometry Grp	6	7	7	6	7	7
Degree of Util (X)	0.176	0.273	0.17	0.167	0.244	0.276
Departure Headway (Hd)	6.03	6.359	5.755	6.068	5.84	5.045
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	596	566	624	592	619	717
Service Time	4.062	4.088	3.484	4.1	3.54	2.745
HCM Lane V/C Ratio	0.176	0.274	0.17	0.167	0.244	0.275
HCM Control Delay	10.4	11.5	9.7	10.3	10.4	9.7
HCM Lane LOS	B	B	A	B	B	A
HCM 95th-tile Q	0.6	1.1	0.6	0.6	1	1.1

Appendix C

Future Intersection Control Evaluation

Peak-Hour Factor

Refer to the peak-hour factor discussion in this chapter under Section II, Urban Streets, Required Input Data and Estimated Values.

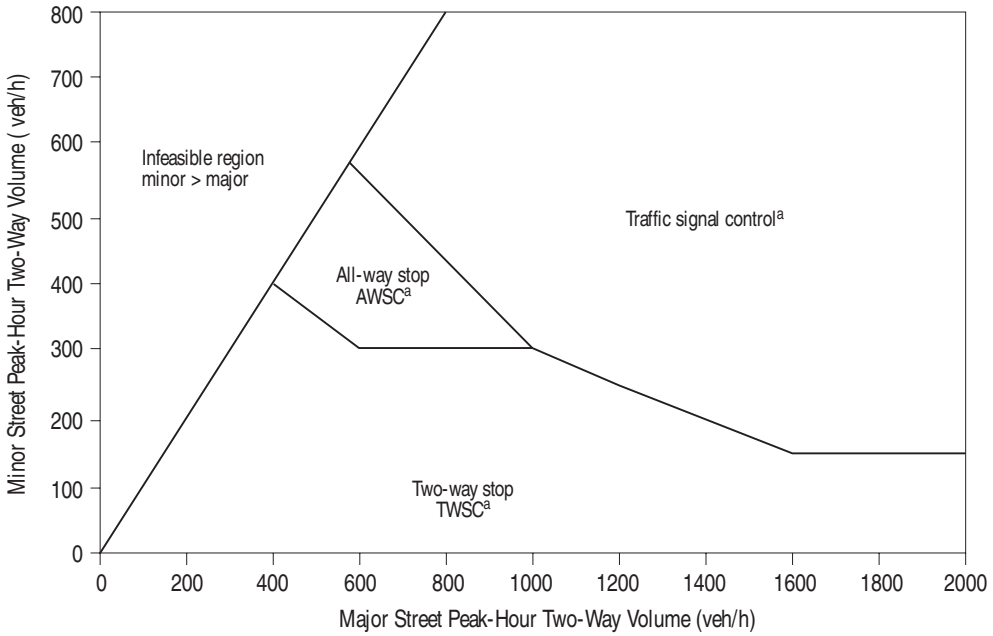
Length of Analysis Period

Refer to the length of analysis period discussion in this chapter under Section II, Urban Streets, Required Input Data and Estimated Values.

Intersection Control Type

The intersection control type for an existing facility is known, by definition. In the case of future facilities, the likely intersection control types can be forecast using Exhibit 10-15 and the forecast two-way peak-hour volumes on the major and minor streets. Note that this exhibit is based on a set of specific assumptions, which are identified in a footnote.

EXHIBIT 10-15. INTERSECTION CONTROL TYPE AND PEAK-HOUR VOLUMES
(SEE FOOTNOTE FOR ASSUMED VALUES)



Notes
a. Roundabouts may be appropriate within portion of these ranges.
Source: Adapted from *Traffic Control Devices Handbook* (*8,* pp. 4–18) - peak-direction, 8-h warrants converted to two-way peak-hour volumes assuming ADT equals twice the 8-h volume and peak hour is 10 percent of daily. Two-way volumes assumed to be 150 percent of peak-direction volume.

Cycle Length

Greater accuracy can be achieved when using the computational methodology if the cycle length for each intersection along the urban street is known or can be calculated on the basis of intersection-specific data. In the absence of a known cycle length or intersection-specific data, the cycle lengths for signalized intersections along an urban street can be estimated using the default values in Exhibit 10-16.

EXHIBIT 10-16. DEFAULT CYCLE LENGTHS BY AREA TYPE

Area Type	Default (s)
CBD	70
Other	100

Intersection	
Int Delay, s/veh	6.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	35	12	58	65	67	22	153	36	100	216	11
Future Vol, veh/h	6	35	12	58	65	67	22	153	36	100	216	11
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	150	-	-	0	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	96	92	96	92	96	96	96	96	92
Heavy Vehicles, %	0	0	0	2	0	2	0	2	2	2	2	0
Mvmt Flow	7	38	13	60	71	70	24	159	38	104	225	12

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	736	684	231	691	671	178	237	0	0	197	0	0
Stage 1	439	439	-	226	226	-	-	-	-	-	-	-
Stage 2	297	245	-	465	445	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.12	6.5	6.22	4.1	-	-	4.12	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.12	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.12	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.518	4	3.318	2.2	-	-	2.218	-	-
Pot Cap-1 Maneuver	337	374	813	359	380	865	1342	-	-	1376	-	-
Stage 1	601	582	-	777	721	-	-	-	-	-	-	-
Stage 2	716	707	-	578	578	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	243	339	813	300	345	865	1342	-	-	1376	-	-
Mov Cap-2 Maneuver	243	339	-	300	345	-	-	-	-	-	-	-
Stage 1	590	538	-	763	708	-	-	-	-	-	-	-
Stage 2	582	694	-	489	534	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	15.9	16.6	0.8	2.4
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1342	-	-	243	398	300	492	1376	-	-
HCM Lane V/C Ratio	0.018	-	-	0.027	0.128	0.201	0.285	0.076	-	-
HCM Control Delay (s)	7.7	-	-	20.2	15.4	20	15.2	7.8	-	-
HCM Lane LOS	A	-	-	C	C	C	C	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.1	0.4	0.7	1.2	0.2	-	-

Intersection	
Int Delay, s/veh	8.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	17	20	4	56	28	147	6	234	204	214	235	32
Future Vol, veh/h	17	20	4	56	28	147	6	234	204	214	235	32
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	-	0	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	18	22	4	61	30	160	7	254	222	233	255	35

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1213	1229	273	1131	1135	365	290	0	0	476	0	0
Stage 1	739	739	-	379	379	-	-	-	-	-	-	-
Stage 2	474	490	-	752	756	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	159	178	766	181	202	680	1272	-	-	1086	-	-
Stage 1	409	424	-	643	615	-	-	-	-	-	-	-
Stage 2	571	549	-	402	416	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	87	139	766	132	158	680	1272	-	-	1086	-	-
Mov Cap-2 Maneuver	87	139	-	132	158	-	-	-	-	-	-	-
Stage 1	407	333	-	639	611	-	-	-	-	-	-	-
Stage 2	413	546	-	293	327	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	52.3	27.4	0.1	4.1
HCM LOS	F	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1272	-	-	119	132	445	1086	-	-
HCM Lane V/C Ratio	0.005	-	-	0.374	0.461	0.427	0.214	-	-
HCM Control Delay (s)	7.8	-	-	52.3	53.7	19	9.2	-	-
HCM Lane LOS	A	-	-	F	F	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	1.5	2.1	2.1	0.8	-	-