REDMOND
Transportation System Plan

Technical Memorandum #5

Date:	April 13, 2018	Project #: 17720 ODOT PA #27456
To:	Redmond TSP Project Management Team (PMT)	
Subject:	Future Systems Conditions	

This technical memorandum presents the key findings related to the year 2040 Baseline Needs Analyses (i.e., No Build) for the Redmond Transportation System Plan (TSP). The following analyses relate primarily to the street system. The memo addresses the "quality of service" anticipated in the future for active modes of travel (i.e., walking, cycling, and transit) and the operational conditions projected to occur along key streets and intersections. Information contained in this memorandum can be used to inform the identification and evaluation of future multimodal transportation system alternatives that meet the goals and objectives guiding the TSP.

All of the technical analyses summarized herein assume that the City will continue to see growth in employment and population between now and the year 2040 in a manner consistent with the existing Comprehensive Plan land use designations, within the existing Urban Growth Boundary (UGB) and consistent with the statewide and regional growth forecasts. At the same time, the analyses assume that the street, transit, pedestrian and bicycle systems will remain as they exist today. This "No Build" scenario is used as a foundation by which cities can test the effectiveness of potential transportation projects, policies, and programs and to help policy makers to weigh trade-offs regarding future funding priorities in a manner that ensures that the transportation system supports and enhances the continued economic growth in a manner that is safe, sustainable, fundable and diverse.

As will be discussed in this memorandum, the baseline analyses highlight the following primary deficiencies:

- Increasing congestion along OR 126 within the UGB, Maple Avenue between US 97 and Northwest Way, Yew Avenue between Airport Way and S 27th Street and US 97 south of SW Glacier Avenue. The City and ODOT are currently engaged in the South US 97 corridor planning efforts to address long-term transportation and land use needs in this segment of the highway. That study will also evaluate portions of Yew Avenue and the OR 126 corridor near US 97.
- Localized intersection improvement needs occur along the congested corridors identified. Improvement needs are most notable along the OR 126 corridor within the UGB.
- Several of the streets within the City, especially in the residential neighborhoods to the west of US 97, lack sidewalks. As future alternatives, the potential to prioritize new sidewalks and pathways that connect neighborhoods to schools, commercial areas and other key destinations should be considered.

- Today, cyclists are required to "share the road" on most streets within Redmond or ride on busier collector and arterial bike lanes, which are classified as "high-stress" under existing and year 2040 baseline conditions and are not suitable for riders of all ages and abilities. When bike lanes are provided, the facilities are often non-buffered and located on higher volume/higher speed roads, which typically offset the "stress reducing" attributes of the bike lane. As part of future alternatives, the need for additional low stress bike facilities to support commuting, recreational and personal travel will be identified.
- A higher level of transit service providing fixed route service throughout the City.

The remainder of this memorandum outlines the Baseline Deficiencies analyses assumptions and findings. Most of the analysis results are presented in figures and tables, with supplemental text provided to explain the illustrated information.

BASIS OF NEEDS ASSESSMENT

The following sections describe the assumptions used to develop the assessment of needs for the TSP.

Planning Area and Land Use Assumptions

The TSP addresses the projects, programs, and policies needed to support growth in population and jobs within the Redmond UGB as well as the travel associated with regional and state economic growth over the next twenty years. The TSP defines the transportation facilities needs within Redmond's adopted Urban Growth Boundary (UGB), as defined in the adopted comprehensive plan. Over time, the City, Deschutes County, and ODOT will monitor the multimodal transportation needs and can update the TSP to respond to changing conditions.

The TSP will establish the multimodal system needed to support the land use designations in the City's Comprehensive Plan. The establishment of the multimodal projects will reflect Redmond policy makers' and community members' priorities to maintain existing facilities and provide multiple transportation options for local and regional travel. These priorities are based on the premise that the City can reduce congestion, save money, and provide health benefits for the entire community by providing alternatives to single-occupancy vehicle travel and by making existing streets safer and more efficient without costly increases to automobile-oriented infrastructure.

2040 Population and Employment Forecasts

The future needs were identified based on forecast year 2040 traffic volumes. These volumes reflect estimates of household and job growth within the adopted Redmond UGB (as shown in Appendix A, Figure 1) as well as in Deschutes County and the overall Central Oregon region. These population and employment forecasts were "coordinated" for compliance with Oregon transportation and land use planning requirements.

Table 1 shows the household and job growth forecasts within the City's UGB. The City of Redmond, in coordination with ODOT, allocated this growth to developable areas within the UGB consistent with the land use designations shown in the adopted Comprehensive Plan.

Table 1: City of Redmond Land Use Estimates

	Year 2010	Year 2040	Growth
Households	10,061	22,433	12,372 (
Employees	10,134	28,550	18,416 (181%)

Traffic Volume Development

Based on the geographic allocations of future job and household growth within the UGB, ODOT's Transportation Planning and Analysis Unit (TPAU) developed traffic volume forecasts for the City's collector and arterial street system using the Bend-Redmond regional" travel demand model, which is a tool that is used to forecast future street volumes based on projected increases in jobs and housing as well as changing travel preferences. This model is calibrated to existing traffic volumes measured on streets and highways within the City. In addition to land use and street network inputs, the model also relies on information about existing traveler behavior and trip-making characteristics derived from surveys, and from research that forecasts how people might use the transportation system in the future.

The travel demand forecasts and measured traffic counts at 45 intersections within the City were used to calculate year 2040 intersection and roadway volumes for use in the analyses of future system deficiencies. The future volume calculations were performed using the procedures outlined in ODOT's Analysis and Procedures Manual (APM).

Baseline Streets and Intersections Analyses

Previously adopted plans and policies for the City, Deschutes County and ODOT all identified a variety of street, pedestrian, bicycle, and transit projects that could be implemented in the future. As discussed above, the baseline Analysis (also known as a "no build alternative") was performed to help identify multimodal projects and programs needed to support economic growth through the year 2040. This analysis will inform the potential project list that will be developed in Spring/Summer 2018.

The Baseline Analysis assumes the 2040 population and employment forecast and the existing transportation system will not change by 2040 except for the construction of transportation improvements that have already been started or for which funding is already allocated. At the time the analysis was prepared, there were no guaranteed funding sources for any major projects that will materially affect traveler behaviors and traffic volumes on the City's street network in the future. This City is upgrading S Canal Boulevard between SW Obsidian Avenue and SW Yew Avenue within the 2018/2019 construction season; this cross-section to the upgrade is reflected within the analyses.

IDENTIFIED TRANSPORTATION NEEDS

For the purposes of identifying future transportation system alternatives, it is helpful to look at a holistic, corridor approach to understand the baseline deficiencies. This broader system approach can be guided by the comparison of anticipated demand on key corridors within the city to planning-level estimates of street capacity. Review of the street segments can identify network connectivity, functional issues, potential corridor management strategies, and multimodal opportunities. This can ensure that the future transportation system looks, feels and operates in a manner consistent with the community's vision.

The baseline streets and intersection needs are based on the information contained in Technical Memorandum #4 , and in adherence with the following overarching TSP goals:

Goal 1. Provide a safe and efficient transportation network that complements key economic development priority areas, the comprehensive plan, and adopted state, regional and local plans and policies.

Goal 2. Advance community and statewide emergency preparedness efforts through support of the Oregon Resiliency Plan.

Safety Needs

A safety analysis and review was completed as part of the existing conditions analysis. Key findings from that memorandum have been used to identify safety needs within Redmond. These include:

- Most injury and fatal crashes during the 2011-2015 timeframe occurred along arterial and collector corridors.
- Six study intersections do not meet one or more statewide crash performance standards (critical crash rate or identified on Safety Priority Index System (SPIS) lists). These include:
    - NW 6th Street at NW Maple Avenue
    - NW Canal Boulevard at NW Larch Avenue
    - US 97 at OR 126
    - SW 23rd Street at SW Highland Avenue
    - SW 27th Street at SW Salmon Avenue
    - SW Helmholtz Way at SW Reservoir Drive
- The central area of Redmond near 5th Street, 6th Street, OR 126, and US 97 has several intersections identified on SPIS lists and with crash rates that exceed statewide crash performance standards. This TSP update will work with the US 97 South Corridor Plan,

whose study area extends to this vicinity, to identify improvement options for these intersections.

Systemic or spot policies or improvements to address these findings should be considered as part of the Alternatives Analysis for this TSP update.

Severe and fatal crashes during the study period as well as study intersection safety performance are shown in Figure 2 and Figure 3.

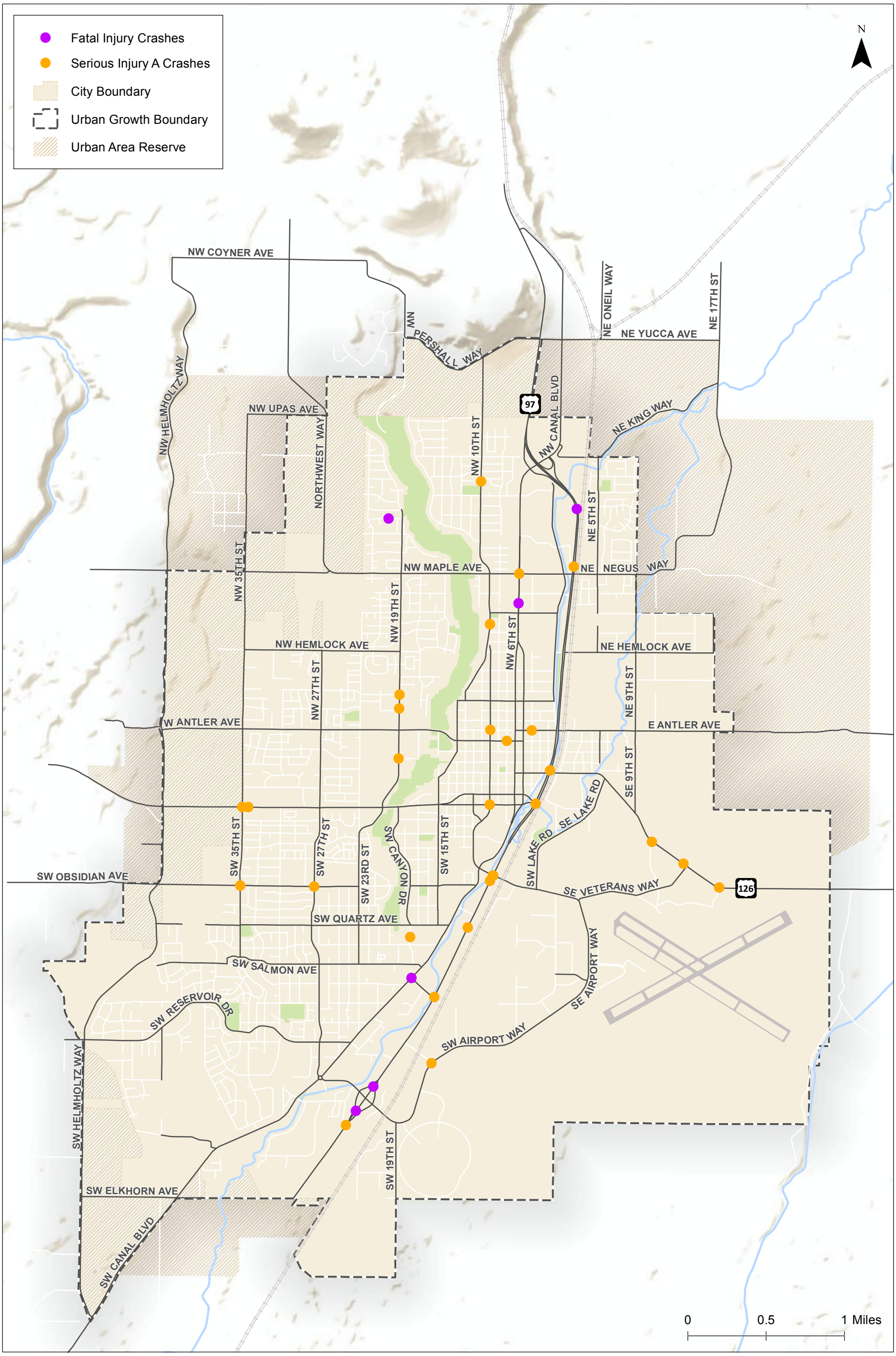
Operational Needs

To inform the baseline assessment, the comparison of the year 2040 traffic demand to capacity for individual arterial and collector streets within Redmond was assessed and then classified within three categories:

- Streets that operate "well" – defined for the purposes of this memo as the baseline demand is less than 80 percent of the capacity. These streets are shown in green in Figure 4.
- Streets that are "nearing capacity" – the demand is between 80 and 100 percent of the capacity. These streets are shown in yellow in the figure.
- Streets that are "over capacity" – the baseline demand exceeds the capacity, which is shown in red on the figure.

Together, with the intersection analyses results (also shown on Figure 4), the corridor analyses can be used to identify the baseline street system deficiencies throughout Redmond. The results of the year 2040 Baseline Analyses are detailed in Appendix B. Per this analysis, key corridors that could experience vehicular congestion and long queues at intersections include:

- OR 126 between SW 15th and Hemholtz
- OR 126 from US 97 east to SE 9th
- Maple Avenue between US 97 and Northwest Way
- US 97 south of SW Glacier Avenue (this segment of the highway is under study by the US 97 South Corridor Plan)
- Yew Avenue/Airport Way between SW 19th and SW Canal

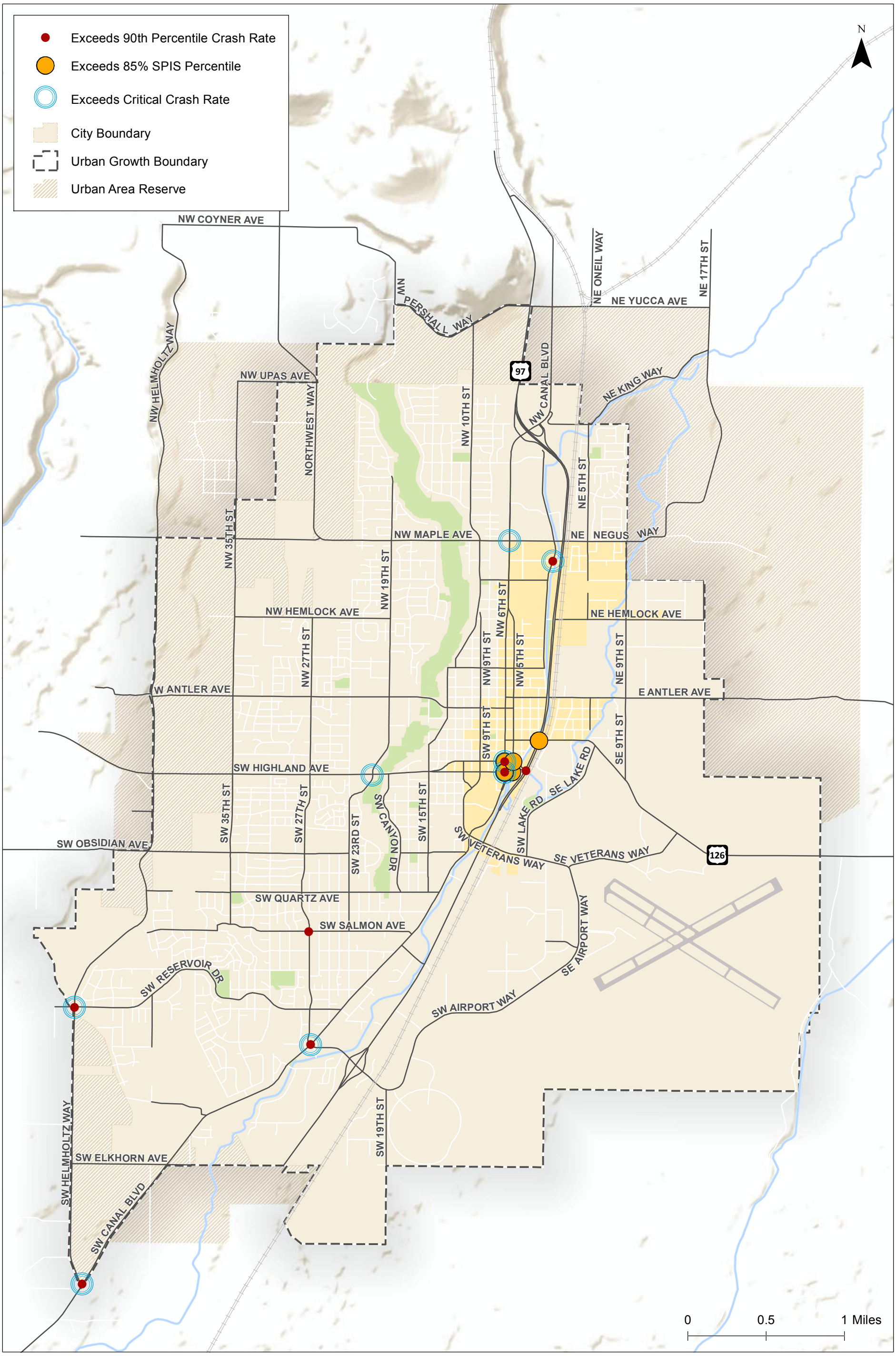


Severe and Fatal Crashes (2011-2015)
Redmond, Oregon

Figure **2**

H:\17\17720 - Redmond Transportation System Plan\gis\Crashes Fatal Severe Injury only Map.mxd - mbarrus - 3:54 PM 12/8/2017

Coordinate System: NAD 1983 Oregon Statewide Lambert Feet Intl



Study Intersection Safety Performance
Redmond, Oregon

Figure **3**

H:\17\17720 - Redmond Transportation System Plan\gis\Crash Rates Per Intersection.mxd - mbarrus - 4:02 PM 12/8/2017

Coordinate System: NAD 1983 Oregon Statewide Lambert Feet Intl

Mobility Targets

- Meets
- Does Not Meet

Demand to Capacity Ratio

- 0.0 - 0.8
- 0.8 - 1.0
- >1.0
- City Boundary
- Downtown Urban Renewal District
- Urban Growth Boundary
- Urban Area Reserve

N

NW PERSHALL WAY
NE ONEIL WAY
NE 17TH ST
NE YUCCA AVE
NW HELMHOLTZ WAY
NW UPAS AVE
NORTHWEST WAY
NW CANAL BLVD
NE KING WAY
NW 10TH ST
97
NW 35TH ST
NW MAPLE AVE
NE NEGUS WAY
NE 5TH ST
NW 19TH ST
NW 6TH ST
NE 9TH ST
NW HEMLOCK AVE
NW 27TH ST
NW 9TH ST
NW 5TH ST
E ANTLER AVE
SW 9TH ST
SE 9TH ST
SW HIGHLAND AVE
SW 15TH ST
SW CANYON DR
SE LAKE RD
SW LAKE RD
SW OBSIDIAN AVE
SW VETERANS WAY
SE VETERANS WAY
126
SW QUARTZ AVE
SW SALMON AVE
SE AIRPORT WAY
SW RESERVOIR DR
SW AIRPORT WAY
SW 19TH ST
SW HELMHOLTZ WAY
SW ELKHORN AVE
SW CANAL BLVD

0 0.5 1 Miles

Future Conditions (2040) Intersection and Segment Operational Analyses
Redmond, Oregon

Figure **4**

Coordinate System: NAD 1983 Oregon Statewide Lambert Feet Intl

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As noted on Figure 4, several study intersections along these corridors are expected to exceed applicable performance standards under 2040 conditions. Individual intersection needs are most notable along the OR 126 corridor within the UGB. Improvements at these locations should be considered in conjunction with the overall context of each corridor.

Alternative Mobility Targets

Two intersections within the City of Redmond currently have established Alternative Mobility Targets, as adopted by the Oregon Transportation Commission (OTC), including

- US 97/Evergreen Avenue – a volume-to-capacity (v/c) ratio of less than 1.0 based on Annual Average Weekday PM Peak conditions during no more than two hours; and,
- US 97/Veterans Way – v/c ratio of less than 0.98.

Both Alternatives Mobility Targets were established through the Senate Bill 1544 transportation analysis and subsequent mitigation plan specifically to allow more traffic congestion associated with economic development benefits from the industrial area. This TSP update and the US 97 South Corridor Study will evaluate the continued need for these Alternative Mobility Standards or if there are mitigation measures that would alleviate the need for them.

ACTIVE TRANSPORTATION NEEDS

The baseline pedestrian, bicycle and transit needs are based on the findings summarized in Technical Memorandum #4 regarding existing system deficiencies as well as other adopted and ongoing planning efforts, and in adherence with the following overarching TSP goals:

Goal 3. Provide transportation choices and address the needs and safety of all travelers, including people of all ages, abilities, ethnicities, and incomes.

Goal 4. Provide comfortable, convenient and safe pedestrian and bicycle facilities for all users.

Goal 5. Provide reliable and convenient transit service to Redmond residents and businesses as well as special transit options for the City's elderly and disabled residents.

Pedestrian Needs

As discussed in Technical Memorandum #4, the City's sidewalk and multi-use pathways contribute to support an economically vital, healthy and equitable community. Today, many of the streets in the residential areas west of US 97 lack a complete sidewalk network. As part of their Access Plan, the City has designated certain streets as American with Disabilities Act (ADA) routes and, within these routes, has identified where infrastructure is missing or in need of updating to meet applicable ADA standards

to connect residents, schools, shopping and parking. The City's ADA Transition Plan prioritizes these routes. Figure 5 illustrates the Access Plan routes.

Figure 6 identifies the presence of sidewalks or existing gaps in the sidewalk network along collector and arterial facilities. Filling these gaps is a need that will be evaluated during the Alternatives Analysis.

As future alternatives are considered, the potential to prioritize sidewalk improvements that connect neighborhoods with key destinations in the City will be analyzed. Also, as identified in the existing conditions deficiencies analyses, the City's Neighborhood Revitalization Project rated several key pedestrian facilities related to "Pedestrian Level of Traffic Stress (PLTS)." The PLTS can communicate the level of comfort pedestrians experience while using specific facilities and generally accounts for the presence and condition of sidewalks and ADA ramps, the nature of crossings, and the characteristics of the adjacent roadways. Using this measure and based on community input, the City's Neighborhood Revitalization Plan identified the following deficiencies:

- Citywide sidewalk coverage is largely limited and incomplete.
- The majority of city sidewalks are classified as PLTS 3 (medium stress).
- The only low stress facilities (PTLS 1) throughout the city are separate multiuse paths such as the Dry Canyon Trail.
- Overall, the high stress scores citywide are predominately a result of sidewalk width and condition. Other characteristics affecting the scores included proximity to higher speed and higher volume vehicle corridors, curb ramp conditions and high-stress crossings.

With the anticipated increase in traffic volumes between now and 2040, the level of stress observed today is expected to further degrade in the future.

Bicycle Needs

As discussed in Technical Memorandum #4, most of the arterial and collector streets within the City are planned to include bike lanes in the future but very few do today, as shown in Figure 7. Rather, most cyclists "share the road" on most streets within Redmond.

As a complement to the on-street bike lanes, the City is planning to sign and stripe bicycle boulevards on a number of low volume, low speed streets throughout the City as well as to develop off-street pathways to provide lower stress environments for cyclists.

As part of future alternatives, the need for additional bike facilities to support commuting, recreational and personal travel will be identified. Also, as identified in the existing conditions deficiencies analyses, the City's Neighborhood Revitalization Project used this Bicycle Level of Street methodology to identify the following deficiencies:

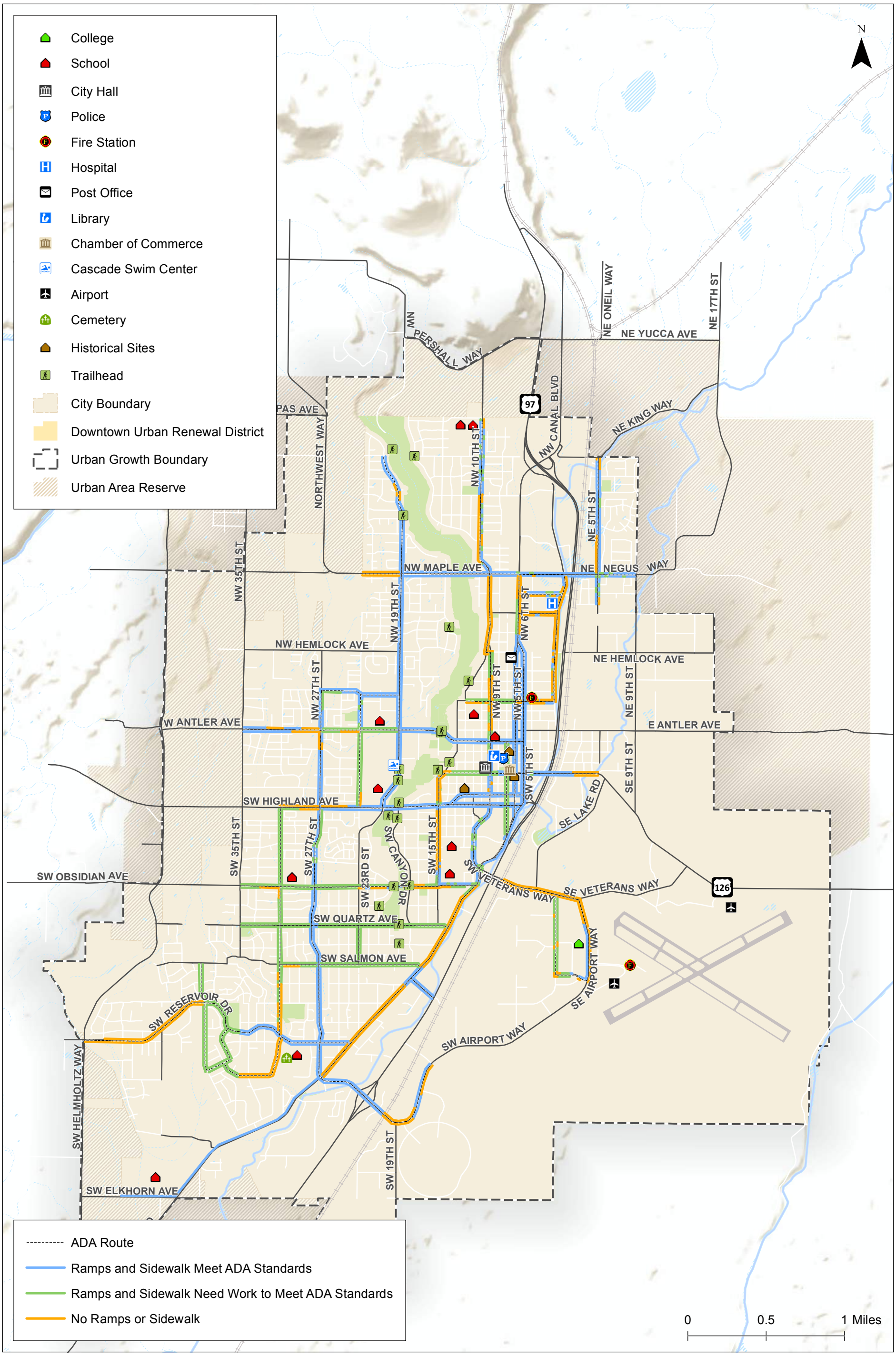
- Neighborhood communities provide a low-stress environment for bicycles, but are generally isolated by high-stress collector and arterial roadways
- Nearly all higher order roadways that provide continuous north-south and east-west connectivity scored as LTS 3 (medium stress) or LTS 4 (high stress)
- Where on-street bike lanes are provided, high posted speeds often reduce the benefit of the dedicated bike facility
- The eastern portion of the city has large areas connected by low stress bicycle environments
- The western portion of the city has frequent instances of high stress roadways acting as barriers between destinations and residential areas
- The Dry Canyon Trail provides a low stress north-south facility through the city, but has limited east-west crossings, causing significant out of direction travel for east-west travelers

With the anticipated increase in traffic volumes between now and 2040, the level of stress observed today is expected to further degrade in the future.

Transit Needs

The City of Redmond, in cooperation with Cascades East Transit, ODOT and the City of Bend, will be undertaking a planning effort to update the Regional Transit Master Plan (RTMP) that will "provide opportunities for transit to "expand mobility options, support community vibrancy and economic vitality, and promote environmental stewardship." These efforts will support the identification of future transit alternatives for the Redmond TSP.

The transit alternatives will also reflect ongoing discussions between CET and the City of Redmond regarding future system needs.



Pedestrian Needs along ADA Routes
Redmond, Oregon

Figure **5**

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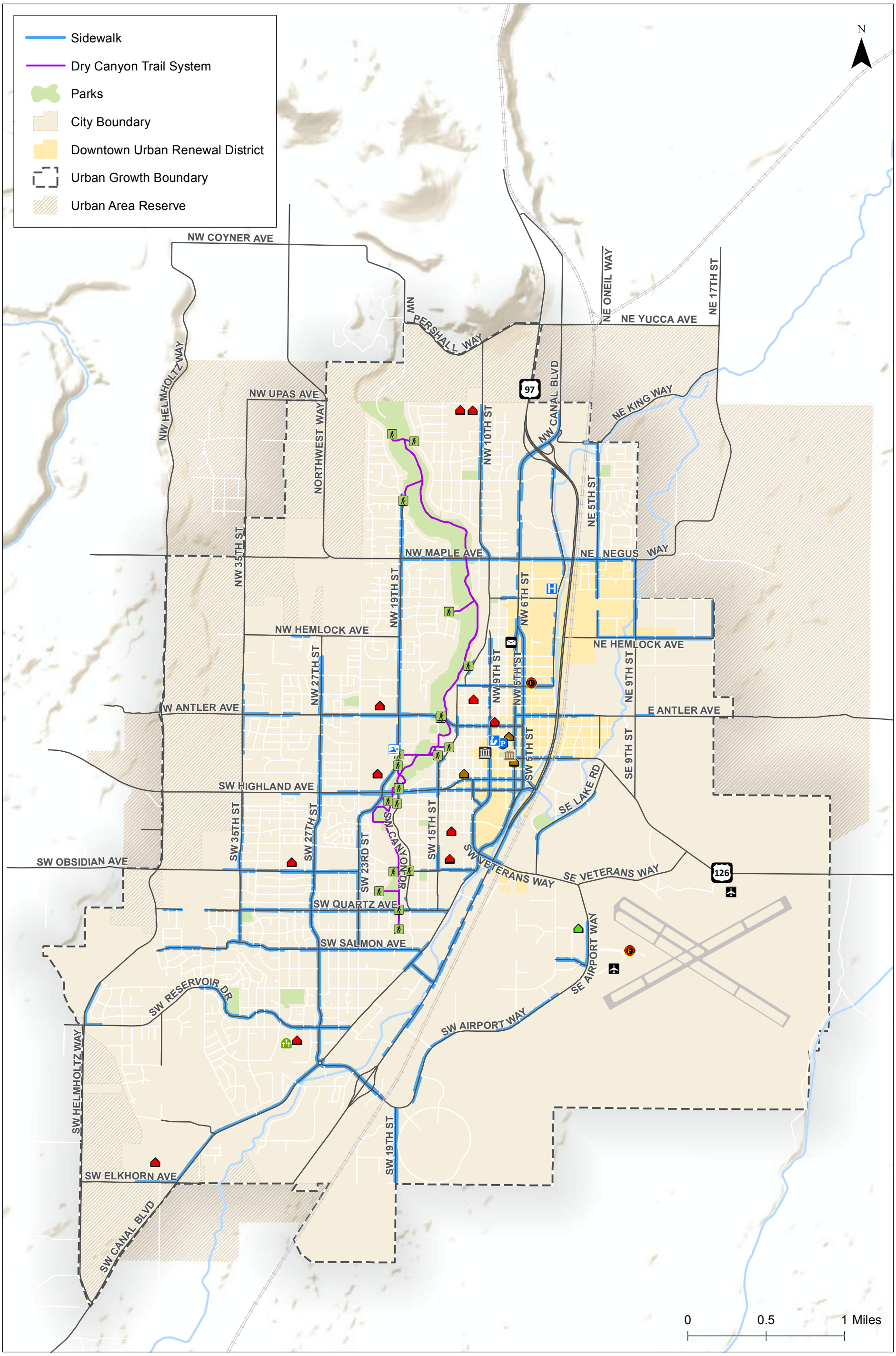
Coordinate System: NAD 1983 Oregon Statewide Lambert Feet Intl



Sidewalk Gaps along Major Corridors
Redmond, Oregon

Figure **6**

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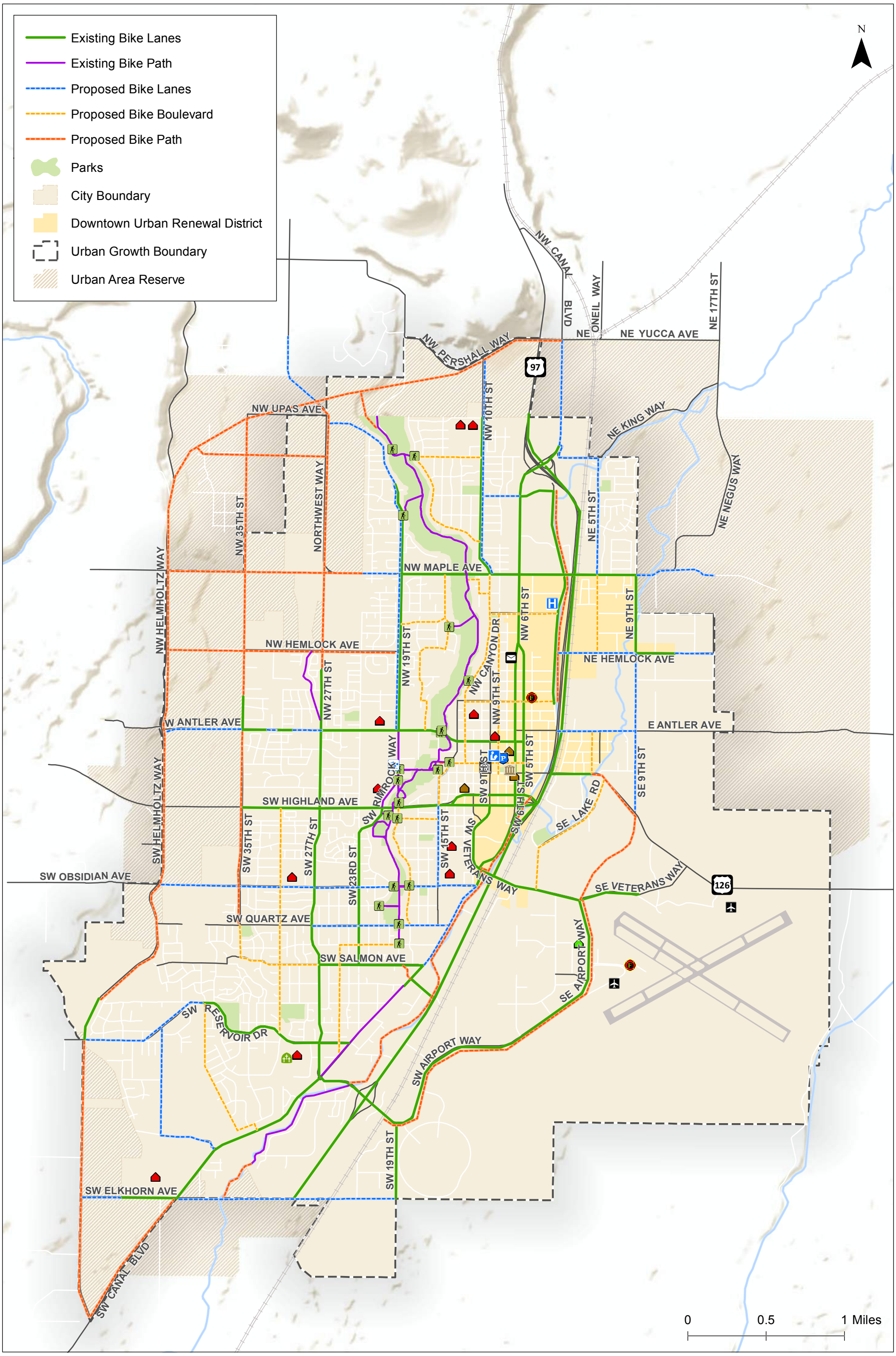
Coordinate System: NAD 1983 Oregon Statewide Lambert Feet Intl



Existing and Planned Bicycle Facilities
Redmond, Oregon

Figure **7**

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Coordinate System: NAD 1983 Oregon Statewide Lambert Feet Intl

ALTERNATIVES EVALUATION FRAMEWORK

As discussed in Technical Memorandum #3, the identification and evaluation of future alternatives considered for the TSP will be informed by the following activities:

- Feedback received through the stakeholder interviews related to needed transportation investments;
- Existing and future baseline deficiencies analyses (as identified in Technical Memorandum #4 and summarized herein);
- Feedback received through the first Public Open House;
- Feedback from the Project Advisory Committee (PAC) and PMT;
- Workshop with City and ODOT staff, and the PMT to consider the feedback obtained to date and weigh the feasibility of potential alternatives.

A preliminary screen of the ideas gathered through the above activities will be conducted by evaluating the ideas against the following key questions:

- Does the project address an identified transportation need, deficiency, or opportunity?
- Is the project within the City's Urban Growth Boundary? Is it within the City's control, or the control of its partnering agencies, to implement?
- Is it technically feasible to construct and/or implement?
- Could the project be reasonably funded within the next 20 years?

If the answer to any question is "no," the project idea will not be further considered. The remaining ideas would be evaluated by City staff and the PMT against the criteria that are intended to help differentiate between alternatives. There are likely other important criteria for consideration that may not be "differentiators" but the following criteria are anticipated for the more detailed review:

- Balances impacts to developable parcels with system and community needs;
- Minimizes impacts to Goal 5 resources;
- Supports or enhances the ability to implement the Oregon Resiliency Plan and/or other key state or regional projects;
- Leverages future transportation investments to reduce access, economic, safety and health disparities between neighborhoods, particularly those with greater populations of low income, minority, youth and/or elderly population than the City as a whole.
- Addresses key connectivity needs on the collector and arterial street system;
- Addresses known safety issues;

- Supports enhanced multimodal access to major activity centers and/or economic development priority areas within the City as well as the region;
- Provides pedestrian and bicycle connectivity to key transit corridors;
- Provides pedestrian and bicycle connectivity to key routes to school;
- Addresses key gaps in the bicycle system;
- Addresses key gaps in the pedestrian system;
- Improves freight mobility on designated freight, truck, rail and air routes;
- Improves mobility for through traffic on state highways; and,
- Leverages public and private investments.

The results of the more detailed analyses against the evaluation criteria will be presented to the PAC for review. The evaluation results will be presented in tabular format with a rating provided for how each alternative addresses the criteria via the following:

●	The project idea addresses the criterion and/or makes substantial improvements in the criteria category
◒	The project idea partially addresses the criterion and/or makes moderate improvements in the criteria category
○	The project idea does not support the intent of, provides minor or incidental benefit and/or negatively impacts the criteria category
N/A	The project idea neither meets nor does not meet intent of criterion. The project idea has no effect, or criterion does not apply

The results of this evaluation will define a 20-year project list that could address the identified transportation needs, and meet the TSP goals as well as criteria contained on ORS 660-012-0035.

SUMMARY OF IDENTIFIED BASELINE DEFICIENCIES

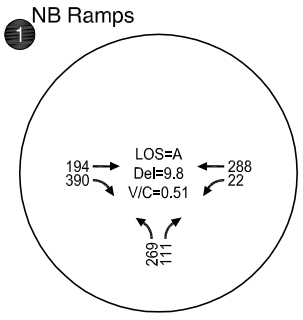
As discussed herein, the 2040 Baseline Analyses identified the following deficiencies for consideration as part of the alternatives analyses:

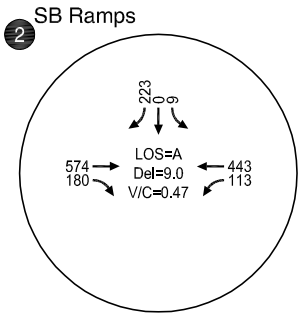
- Increasing congestion along OR 126 within the UGB, Maple Avenue between US 97 and Northwest Way, Yew Avenue between Airport Way and S 27th Street and US 97 south of SW Glacier Avenue. The City and ODOT are currently engaged in the South US 97 corridor planning efforts to address long-term transportation and land use needs in this segment of the highway. That study will also evaluate portions of Yew Avenue and the OR 126 corridor near US 97.
- Several of the intersections along the congested corridors do not meet adopted standards. Notable locations include:

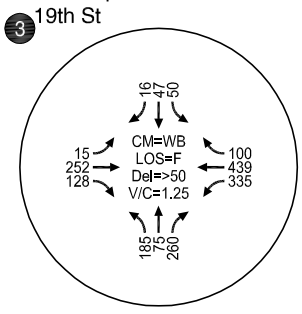
  - OR 126 (SW Highland) corridor intersections including SW 15th, Rimrock, SW 27th, and SW 35th.
  - OR 126 (east) corridor intersection including SE 9th and SE Veteran's Way;
  - US 97 intersections including Veteran's Way, Odem Meadow and the Yew Avenue ramps.
  - Maple/NW 19th; and
  - Yew Avenue at SW 27th and at SW 19th (Airport Way).

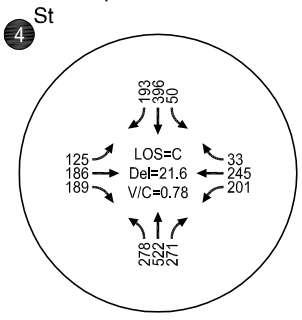
- Several of the streets within the City, especially in the residential neighborhoods to the west of US 97, lack sidewalks today. As future alternatives, the potential to prioritize new sidewalks and pathways that connect neighborhoods to schools, commercial areas and other key destinations should be considered.
- Today, cyclists are required to "share the road" on most streets within Redmond or ride on busier collector and arterial bike lanes, which are classified as "high-stress" under existing and year 2040 baseline conditions and are not suitable for riders of all ages and abilities. When bike lanes are provided, the facilities are often non-buffered and located on higher volume/higher speed roads, which typically offset the "stress reducing" attributes of the bike lane. As part of future alternatives, the need for additional low stress bike facilities to support commuting, recreational and personal travel will be identified.
- A higher level of transit service providing fixed route service throughout the City.

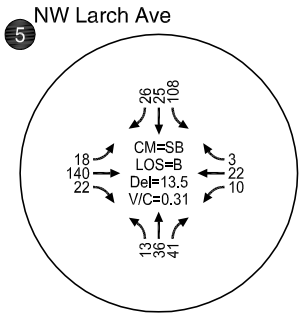
Appendix A 2040 Traffic Volumes

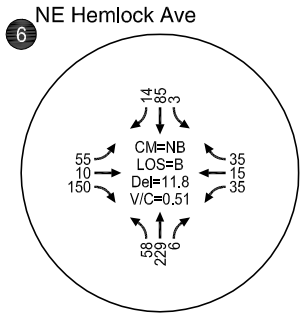
1 NW Canal Blvd/US 97 NB Ramps


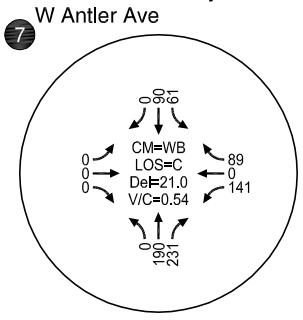
2 NW Canal Blvd/US 97 SB Ramps


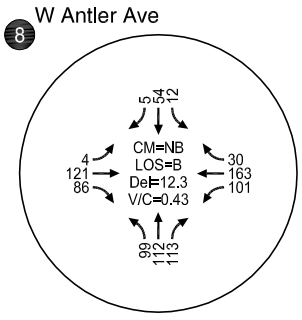
3 NW Maple Ave/NW 19th St


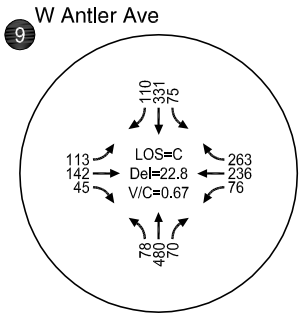
4 NW Maple Ave/NW 6th St


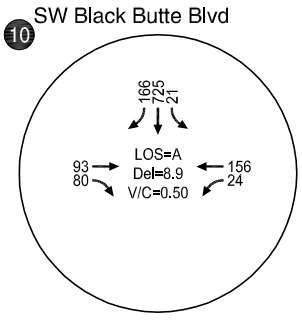
5 NW Canal Blvd/ NW Larch Ave


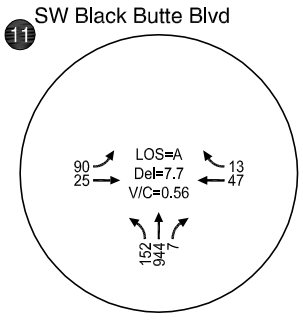
6 NE 9th St/ NE Hemlock Ave


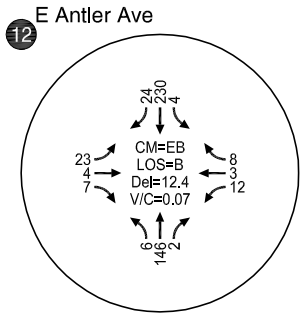
7 NW Helmholtz Way/ W Antler Ave


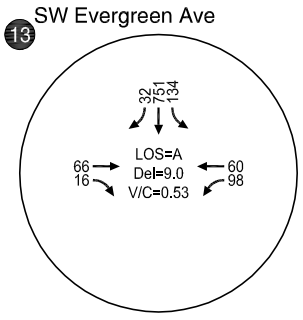
8 SW 27th St/ W Antler Ave


9 NW 19th St/ W Antler Ave


10 SW 6th St/ SW Black Butte Blvd


11 SW 5th St/ SW Black Butte Blvd


12 NE 9th St/ E Antler Ave


13 SW 6th St/ SW Evergreen Ave


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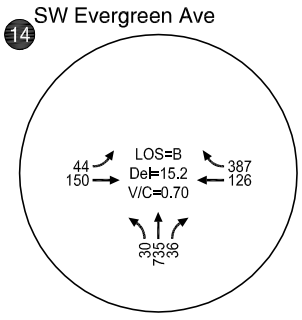

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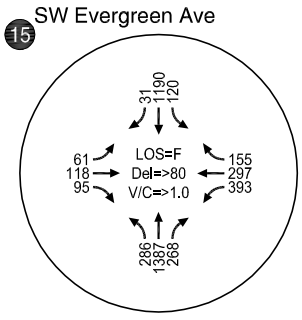

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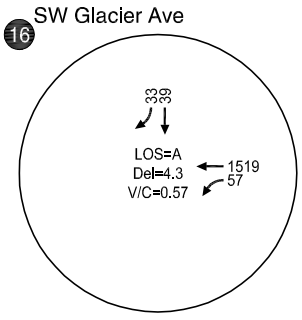

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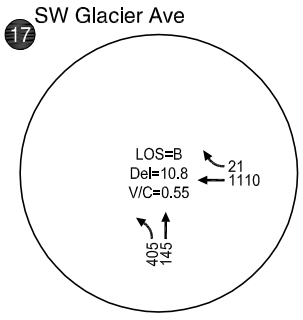

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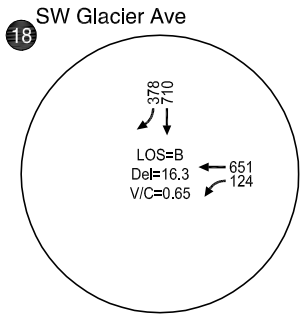

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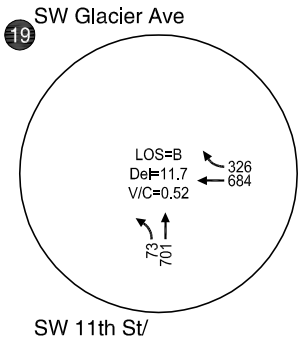
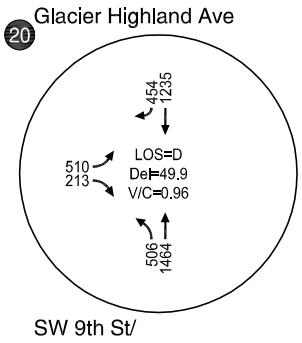
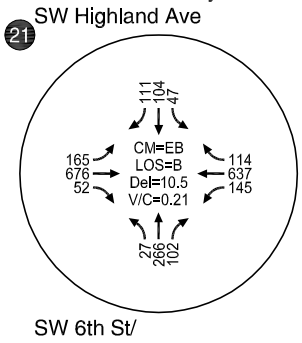


20 US 97/ Glacier Highland Ave


21 SW Helmholtz Way/ SW Highland Ave


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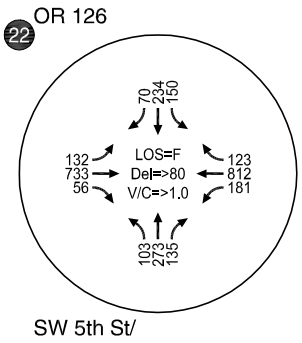
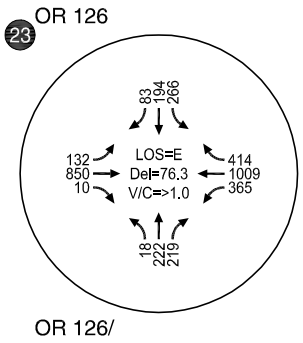
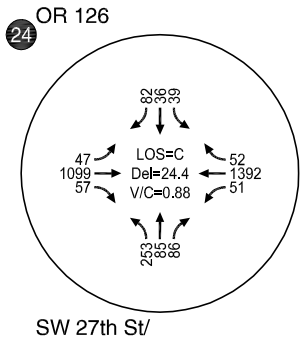


23 SW Rimrock Dr/ OR 126


24 SW 15th St/ OR 126


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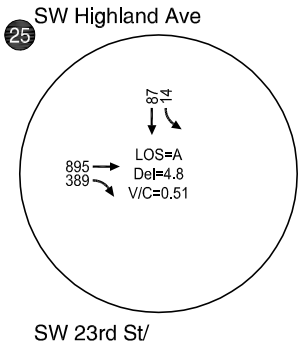

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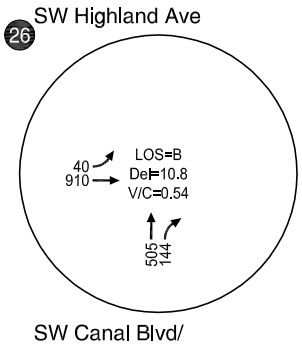

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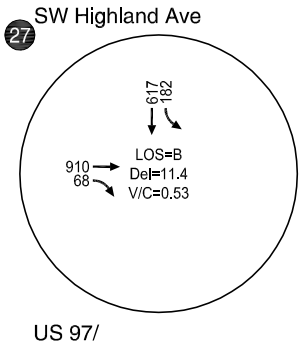

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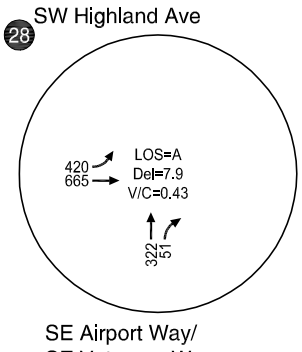
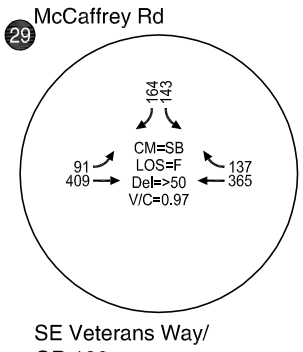
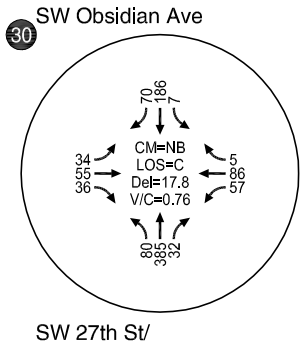


29 OR 126/ McCaffrey Rd


30 SW 27th St/ SW Obsidian Ave


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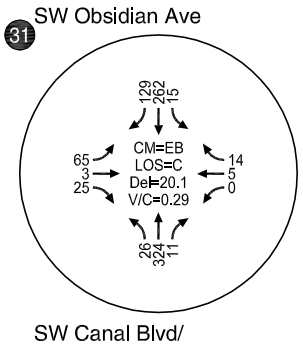
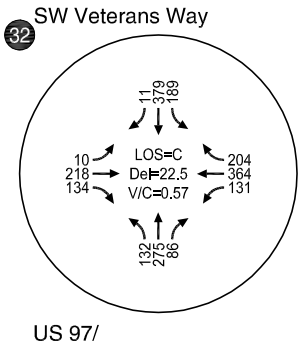


32 SW Canal Blvd/ SW Veterans Way


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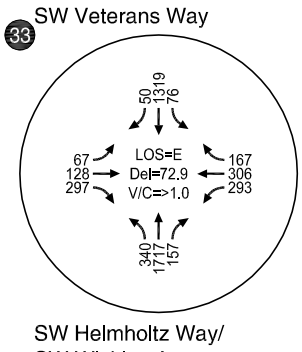

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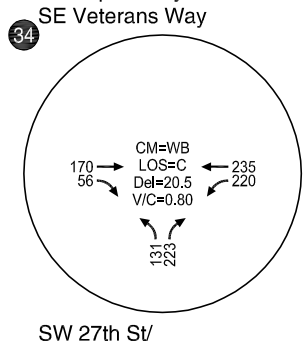

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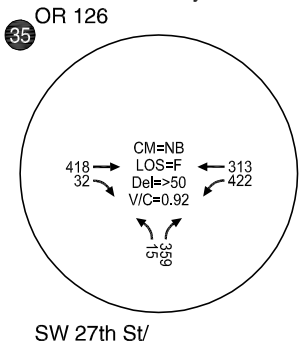

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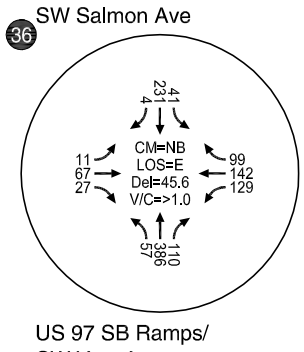
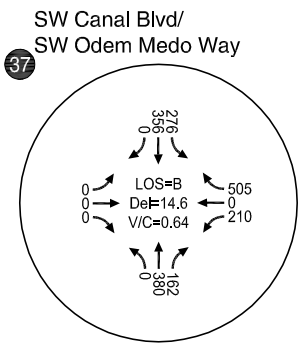


37 SW Canal Blvd/ SW Odem Medo Way


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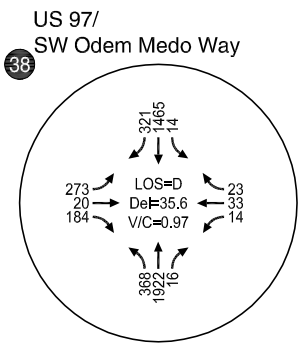

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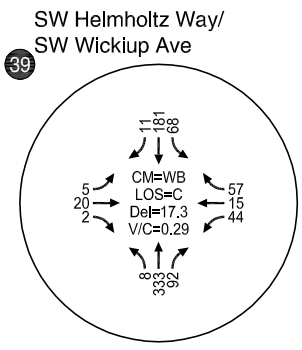

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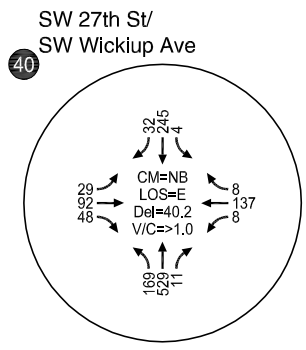

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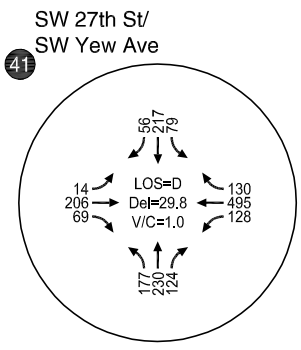

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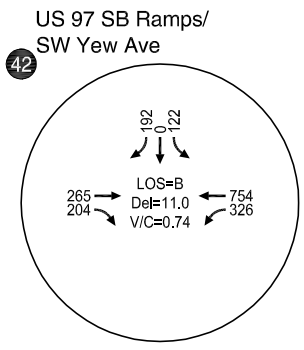

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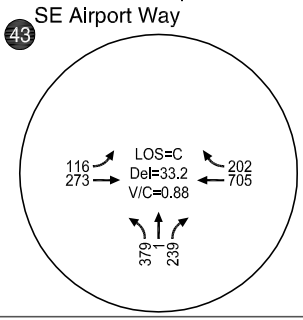

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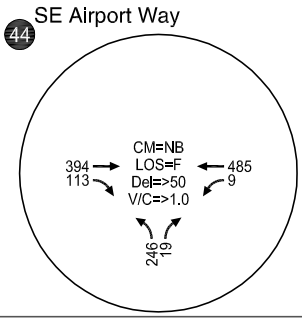

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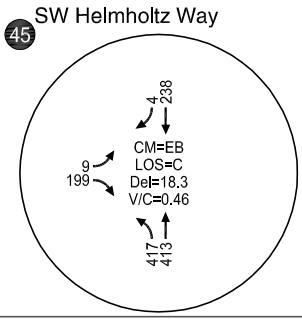


2040 Intersection Peak Hour Volumes and Lane Configurations
Redmond, Oregon

Figure
XX

Appendix B Operational Analyses

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	194	390	22	288	269	111
Future Volume (vph)	194	390	22	288	269	111
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1881	1583	1543	1863	1770	1583
Flt Permitted	1.00	1.00	0.46	1.00	0.95	1.00
Satd. Flow (perm)	1881	1583	750	1863	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	211	424	24	313	292	121
RTOR Reduction (vph)	0	286	0	0	0	84
Lane Group Flow (vph)	211	138	24	313	292	37
Heavy Vehicles (%)	1%	2%	17%	2%	2%	2%
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	6		5	2	4	
Permitted Phases		6	2			4
Actuated Green, G (s)	12.7	12.7	18.0	18.0	12.0	12.0
Effective Green, g (s)	12.7	12.7	18.0	18.0	12.0	12.0
Actuated g/C Ratio	0.33	0.33	0.46	0.46	0.31	0.31
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	612	515	362	859	544	487
v/s Ratio Prot	0.11		0.00	c0.17	c0.17	
v/s Ratio Perm		0.09	0.03			0.02
v/c Ratio	0.34	0.27	0.07	0.36	0.54	0.08
Uniform Delay, d1	10.0	9.7	6.0	6.8	11.2	9.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.3	0.1	0.3	1.0	0.1
Delay (s)	10.3	10.0	6.1	7.1	12.2	9.6
Level of Service	B	A	A	A	B	A
Approach Delay (s)	10.1			7.0	11.5	
Approach LOS	B			A	B	

Intersection Summary			
HCM 2000 Control Delay	9.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	39.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	40.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	211	424	24	313	292	121
v/c Ratio	0.32	0.51	0.05	0.43	0.49	0.20
Control Delay	11.8	4.2	7.4	10.1	13.9	4.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.8	4.2	7.4	10.1	13.9	4.0
Queue Length 50th (ft)	22	0	2	35	35	0
Queue Length 95th (ft)	101	53	12	100	139	28
Internal Link Dist (ft)	689			452	761	
Turn Bay Length (ft)			200			175
Base Capacity (vph)	1775	1518	450	1831	1514	1371
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.28	0.05	0.17	0.19	0.09

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	574	180	113	443	0	0	0	0	9	0	223
Future Volume (vph)	0	574	180	113	443	0	0	0	0	9	0	223
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5		4.5	4.5						4.5	4.5
Lane Util. Factor		0.95		1.00	1.00						1.00	1.00
Frpb, ped/bikes		1.00		1.00	1.00						1.00	1.00
Flpb, ped/bikes		1.00		1.00	1.00						1.00	1.00
Frt		0.96		1.00	1.00						1.00	0.85
Flt Protected		1.00		0.95	1.00						0.95	1.00
Satd. Flow (prot)		3437		1805	1863						1805	1583
Flt Permitted		1.00		0.22	1.00						0.95	1.00
Satd. Flow (perm)		3437		413	1863						1805	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	624	196	123	482	0	0	0	0	10	0	242
RTOR Reduction (vph)	0	34	0	0	0	0	0	0	0	0	0	202
Lane Group Flow (vph)	0	786	0	123	482	0	0	0	0	0	10	40
Confl. Peds. (#/hr)			1	1								
Heavy Vehicles (%)	0%	1%	0%	0%	2%	0%	0%	0%	0%	0%	0%	2%
Turn Type		NA		pm+pt	NA					Perm	NA	Perm
Protected Phases		6		5	2						8	
Permitted Phases				2						8		8
Actuated Green, G (s)		17.7		27.2	27.2						7.2	7.2
Effective Green, g (s)		17.7		27.2	27.2						7.2	7.2
Actuated g/C Ratio		0.41		0.63	0.63						0.17	0.17
Clearance Time (s)		4.5		4.5	4.5						4.5	4.5
Vehicle Extension (s)		3.0		3.0	3.0						3.0	3.0
Lane Grp Cap (vph)		1401		419	1167						299	262
v/s Ratio Prot		c0.23		0.03	c0.26							
v/s Ratio Perm				0.15							0.01	c0.03
v/c Ratio		0.56		0.29	0.41						0.03	0.15
Uniform Delay, d1		9.9		4.2	4.1						15.2	15.5
Progression Factor		1.00		1.00	1.00						1.00	1.00
Incremental Delay, d2		0.5		0.4	0.2						0.0	0.3
Delay (s)		10.4		4.6	4.3						15.2	15.8
Level of Service		B		A	A						B	B
Approach Delay (s)		10.4			4.4			0.0			15.7	
Approach LOS		B			A			A			B	

Intersection Summary			
HCM 2000 Control Delay	9.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	43.4	Sum of lost time (s)	13.5
Intersection Capacity Utilization	44.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBL	WBT	SBT	SBR
Lane Group Flow (vph)	820	123	482	10	242
v/c Ratio	0.56	0.26	0.42	0.03	0.52
Control Delay	11.5	4.9	5.7	16.9	7.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	11.5	4.9	5.7	16.9	7.7
Queue Length 50th (ft)	71	8	41	2	0
Queue Length 95th (ft)	135	28	109	13	47
Internal Link Dist (ft)	3583		689	648	
Turn Bay Length (ft)		250			275
Base Capacity (vph)	2294	470	1663	1412	1291
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.36	0.26	0.29	0.01	0.19

Intersection Summary

Intersection	
Intersection Delay, s/veh	71.9
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	15	252	128	335	439	100	185	76	260	50	47	16
Future Vol, veh/h	15	252	128	335	439	100	185	76	260	50	47	16
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles, %	0	3	0	1	0	0	0	0	1	0	0	0
Mvmt Flow	16	268	136	356	467	106	197	81	277	53	50	17
Number of Lanes	1	1	0	1	1	0	0	1	1	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	2	2
HCM Control Delay	55.1	114.8	24.6	17.6
HCM LOS	F	F	C	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	71%	0%	100%	0%	100%	0%	44%
Vol Thru, %	29%	0%	0%	66%	0%	81%	42%
Vol Right, %	0%	100%	0%	34%	0%	19%	14%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	261	260	15	380	335	539	113
LT Vol	185	0	15	0	335	0	50
Through Vol	76	0	0	252	0	439	47
RT Vol	0	260	0	128	0	100	16
Lane Flow Rate	278	277	16	404	356	573	120
Geometry Grp	7	7	7	7	7	7	6
Degree of Util (X)	0.67	0.586	0.04	0.926	0.85	1.261	0.321
Departure Headway (Hd)	8.974	7.881	9.318	8.606	8.584	7.914	9.989
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	405	462	387	424	424	459	362
Service Time	6.674	5.581	7.018	6.306	6.331	5.66	7.989
HCM Lane V/C Ratio	0.686	0.6	0.041	0.953	0.84	1.248	0.331
HCM Control Delay	28.1	21.1	12.4	56.8	44.2	158.6	17.6
HCM Lane LOS	D	C	B	F	E	F	C
HCM 95th-tile Q	4.7	3.7	0.1	10.3	8.3	23.8	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	125	186	189	201	245	33	278	522	271	50	396	193
Future Volume (vph)	125	186	189	201	245	33	278	522	271	50	396	193
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.5		4.0	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.95		1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1735	1881	1579	1787	1831		1787	3403		1671	3372	
Flt Permitted	0.42	1.00	1.00	0.47	1.00		0.23	1.00		0.23	1.00	
Satd. Flow (perm)	769	1881	1579	885	1831		441	3403		410	3372	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	137	204	208	221	269	36	305	574	298	55	435	212
RTOR Reduction (vph)	0	0	157	0	6	0	0	66	0	0	64	0
Lane Group Flow (vph)	137	204	51	221	299	0	305	806	0	55	583	0
Confl. Peds. (#/hr)	2		1	1		2	2					2
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	4%	1%	1%	1%	2%	0%	1%	1%	0%	8%	1%	1%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8		8	4			6			2		
Actuated Green, G (s)	22.9	17.6	17.6	26.9	19.6		34.6	26.9		26.0	22.3	
Effective Green, g (s)	22.9	17.6	17.6	26.9	19.6		34.6	26.9		26.0	22.3	
Actuated g/C Ratio	0.32	0.24	0.24	0.37	0.27		0.48	0.37		0.36	0.31	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.5		4.0	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	315	459	385	422	498		367	1271		212	1044	
v/s Ratio Prot	0.03	0.11		c0.05	c0.16		c0.10	0.24		0.01	0.17	
v/s Ratio Perm	0.11		0.03	0.14			c0.30			0.08		
v/c Ratio	0.43	0.44	0.13	0.52	0.60		0.83	0.63		0.26	0.56	
Uniform Delay, d1	18.4	23.1	21.2	16.3	22.8		13.1	18.5		15.5	20.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.0	0.7	0.2	1.2	2.0		14.7	1.0		0.7	0.7	
Delay (s)	19.3	23.7	21.4	17.5	24.8		27.9	19.6		16.2	21.4	
Level of Service	B	C	C	B	C		C	B		B	C	
Approach Delay (s)		21.7			21.8			21.7			21.0	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	21.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	72.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	69.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	137	204	208	221	305	305	872	55	647
v/c Ratio	0.38	0.46	0.39	0.54	0.59	0.84	0.63	0.19	0.62
Control Delay	18.4	27.0	6.1	21.7	28.6	38.6	19.4	12.7	21.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.4	27.0	6.1	21.7	28.6	38.6	19.4	12.7	21.0
Queue Length 50th (ft)	38	75	0	64	117	77	154	12	104
Queue Length 95th (ft)	85	150	49	131	221	#222	253	35	178
Internal Link Dist (ft)		3891			719		1235		3583
Turn Bay Length (ft)	200		200	100		100		100	
Base Capacity (vph)	364	927	883	411	906	361	1656	297	1585
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.22	0.24	0.54	0.34	0.84	0.53	0.19	0.41

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection	
Int Delay, s/veh	7.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	18	140	22	10	22	3	13	36	41	108	25	26
Future Vol, veh/h	18	140	22	10	22	3	13	36	41	108	25	26
Conflicting Peds, #/hr	0	0	2	2	0	0	0	0	2	2	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	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	0	0	20	0	0	0	0	0	0	0	11	0
Mvmt Flow	21	165	26	12	26	4	15	42	48	127	29	31

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	29	0	0	193	0	0	303	275	182	318	286	28
Stage 1	-	-	-	-	-	-	222	222	-	51	51	-
Stage 2	-	-	-	-	-	-	81	53	-	267	235	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.61	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.61	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.61	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4.099	3.3
Pot Cap-1 Maneuver	1597	-	-	1392	-	-	653	636	866	639	609	1053
Stage 1	-	-	-	-	-	-	785	723	-	967	835	-
Stage 2	-	-	-	-	-	-	932	855	-	743	694	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1597	-	-	1389	-	-	598	620	863	560	593	1053
Mov Cap-2 Maneuver	-	-	-	-	-	-	598	620	-	560	593	-
Stage 1	-	-	-	-	-	-	772	711	-	952	827	-
Stage 2	-	-	-	-	-	-	865	847	-	649	682	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.7	2.2	11	13.5
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	707	1597	-	-	1389	-	-	612
HCM Lane V/C Ratio	0.15	0.013	-	-	0.008	-	-	0.306
HCM Control Delay (s)	11	7.3	0	-	7.6	0	-	13.5
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.5	0	-	-	0	-	-	1.3

Intersection	
Intersection Delay, s/veh	11.8
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	55	10	150	35	15	35	58	229	6	3	85	14
Future Vol, veh/h	55	10	150	35	15	35	58	229	6	3	85	14
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles, %	0	11	6	0	8	0	23	1	0	0	3	62
Mvmt Flow	63	11	170	40	17	40	66	260	7	3	97	16
Number of Lanes	0	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	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	1	1
HCM Control Delay	10.5	9.3	14.2	9.5
HCM LOS	B	A	B	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	20%	26%	41%	3%	0%
Vol Thru, %	78%	5%	18%	97%	0%
Vol Right, %	2%	70%	41%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	293	215	85	88	14
LT Vol	58	55	35	3	0
Through Vol	229	10	15	85	0
RT Vol	6	150	35	0	14
Lane Flow Rate	333	244	97	100	16
Geometry Grp	5	2	2	7	7
Degree of Util (X)	0.51	0.338	0.145	0.163	0.023
Departure Headway (Hd)	5.512	4.987	5.391	5.86	5.185
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	656	726	665	612	690
Service Time	3.541	2.987	3.431	3.596	2.92
HCM Lane V/C Ratio	0.508	0.336	0.146	0.163	0.023
HCM Control Delay	14.2	10.5	9.3	9.7	8
HCM Lane LOS	B	B	A	A	A
HCM 95th-tile Q	2.9	1.5	0.5	0.6	0.1

Intersection	
Int Delay, s/veh	6.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	0	141	0	89	0	190	231	61	90	0
Future Vol, veh/h	0	0	0	141	0	89	0	190	231	61	90	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	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	0	0	0	0	0	0	0	0	1	0	8	0
Mvmt Flow	0	0	0	160	0	101	0	216	263	69	102	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	639	719	102	588	588	347	102	0	0	478	0	0
Stage 1	241	241	-	347	347	-	-	-	-	-	-	-
Stage 2	398	478	-	241	241	-	-	-	-	-	-	-
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	392	357	959	423	424	701	1503	-	-	1095	-	-
Stage 1	767	710	-	673	638	-	-	-	-	-	-	-
Stage 2	632	559	-	767	710	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	318	333	959	401	396	701	1503	-	-	1095	-	-
Mov Cap-2 Maneuver	318	333	-	401	396	-	-	-	-	-	-	-
Stage 1	767	662	-	673	638	-	-	-	-	-	-	-
Stage 2	541	559	-	716	662	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	21	0	3.4
HCM LOS	A	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1503	-	-	-	481	1095	-	-
HCM Lane V/C Ratio	-	-	-	-	0.543	0.063	-	-
HCM Control Delay (s)	0	-	-	0	21	8.5	0	-
HCM Lane LOS	A	-	-	A	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	-	3.2	0.2	-	-

Intersection	
Intersection Delay, s/veh	12.3
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	121	86	101	163	30	99	112	113	12	54	5
Future Vol, veh/h	4	121	86	101	163	30	99	112	113	12	54	5
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles, %	0	3	2	1	0	0	0	0	1	0	0	0
Mvmt Flow	5	138	98	115	185	34	113	127	128	14	61	6
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	12.8	12.1	12.5	10.5
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%	50%	0%	58%	0%	84%	0%	92%
Vol Right, %	0%	50%	0%	42%	0%	16%	0%	8%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	99	225	4	207	101	193	12	59
LT Vol	99	0	4	0	101	0	12	0
Through Vol	0	112	0	121	0	163	0	54
RT Vol	0	113	0	86	0	30	0	5
Lane Flow Rate	112	256	5	235	115	219	14	67
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.213	0.422	0.009	0.4	0.215	0.372	0.028	0.126
Departure Headway (Hd)	6.812	5.948	6.873	6.122	6.739	6.104	7.323	6.752
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	525	603	519	586	531	588	487	528
Service Time	4.569	3.704	4.633	3.882	4.496	3.861	5.098	4.527
HCM Lane V/C Ratio	0.213	0.425	0.01	0.401	0.217	0.372	0.029	0.127
HCM Control Delay	11.4	13	9.7	12.9	11.3	12.5	10.3	10.5
HCM Lane LOS	B	B	A	B	B	B	B	B
HCM 95th-tile Q	0.8	2.1	0	1.9	0.8	1.7	0.1	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	113	142	45	76	236	263	78	480	70	75	331	110
Future Volume (vph)	113	142	45	76	236	263	78	480	70	75	331	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.97	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.98		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1762	1808		1768	1881	1570	1805	1837		1805	1819	
Flt Permitted	0.40	1.00		0.52	1.00	1.00	0.34	1.00		0.17	1.00	
Satd. Flow (perm)	746	1808		966	1881	1570	646	1837		326	1819	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	122	153	48	82	254	283	84	516	75	81	356	118
RTOR Reduction (vph)	0	14	0	0	0	148	0	5	0	0	12	0
Lane Group Flow (vph)	122	187	0	82	254	135	84	586	0	81	462	0
Confl. Peds. (#/hr)	12		2	2		12	1		4	4		1
Heavy Vehicles (%)	2%	1%	0%	2%	1%	0%	0%	1%	2%	0%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6	7	3	8		7	4	
Permitted Phases	2			6		6	8			4		
Actuated Green, G (s)	20.9	16.1		20.7	16.0	22.5	34.7	30.0		38.3	31.8	
Effective Green, g (s)	20.9	16.1		20.7	16.0	22.5	34.7	30.0		38.3	31.8	
Actuated g/C Ratio	0.28	0.21		0.27	0.21	0.30	0.46	0.40		0.51	0.42	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	2.0	3.5		2.0	3.5	2.0	2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)	271	386		315	399	562	370	731		293	768	
v/s Ratio Prot	c0.03	0.10		0.02	c0.14	c0.02	0.01	c0.32		0.02	0.25	
v/s Ratio Perm	0.10			0.06		0.07	0.09			0.12		
v/c Ratio	0.45	0.48		0.26	0.64	0.24	0.23	0.80		0.28	0.60	
Uniform Delay, d1	21.3	26.0		20.8	27.0	19.9	12.1	20.0		12.3	16.8	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	1.1		0.2	3.5	0.1	0.1	6.3		0.2	1.3	
Delay (s)	21.8	27.1		21.0	30.5	20.0	12.2	26.3		12.5	18.2	
Level of Service	C	C		C	C	C	B	C		B	B	
Approach Delay (s)		25.1			24.4			24.6			17.4	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	22.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	75.3	Sum of lost time (s)	18.0
Intersection Capacity Utilization	70.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	122	201	82	254	283	84	591	81	474
v/c Ratio	0.40	0.49	0.24	0.62	0.45	0.20	0.82	0.28	0.59
Control Delay	21.9	28.5	19.0	34.5	8.0	11.4	32.5	12.6	22.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.9	28.5	19.0	34.5	8.0	11.4	32.5	12.6	22.1
Queue Length 50th (ft)	42	80	27	115	24	18	244	18	172
Queue Length 95th (ft)	78	142	56	189	76	46	#476	44	312
Internal Link Dist (ft)		2545		3983			2700		5211
Turn Bay Length (ft)	125		150		225	175		225	
Base Capacity (vph)	305	713	348	731	631	418	823	299	823
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.28	0.24	0.35	0.45	0.20	0.72	0.27	0.58

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	93	80	24	156	0	0	0	0	21	725	166
Future Volume (vph)	0	93	80	24	156	0	0	0	0	21	725	166
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0						5.0	
Lane Util. Factor		1.00			1.00						0.95	
Frpb, ped/bikes		1.00			1.00						1.00	
Flpb, ped/bikes		1.00			1.00						1.00	
Frt		0.94			1.00						0.97	
Flt Protected		1.00			0.99						1.00	
Satd. Flow (prot)		1782			1888						3453	
Flt Permitted		1.00			0.93						1.00	
Satd. Flow (perm)		1782			1775						3453	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	98	84	25	164	0	0	0	0	22	763	175
RTOR Reduction (vph)	0	52	0	0	0	0	0	0	0	0	27	0
Lane Group Flow (vph)	0	130	0	0	189	0	0	0	0	0	933	0
Confl. Peds. (#/hr)	1					1	1		1	1		1
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	2%
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		8			4						2	
Permitted Phases				4						2		
Actuated Green, G (s)		10.3			10.3						21.3	
Effective Green, g (s)		10.3			10.3						21.3	
Actuated g/C Ratio		0.25			0.25						0.51	
Clearance Time (s)		5.0			5.0						5.0	
Vehicle Extension (s)		3.0			3.0						3.0	
Lane Grp Cap (vph)		441			439						1768	
v/s Ratio Prot		0.07										
v/s Ratio Perm					c0.11						0.27	
v/c Ratio		0.29			0.43						0.53	
Uniform Delay, d1		12.7			13.2						6.8	
Progression Factor		1.00			1.00						1.00	
Incremental Delay, d2		0.4			0.7						0.3	
Delay (s)		13.1			13.9						7.1	
Level of Service		B			B						A	
Approach Delay (s)		13.1			13.9			0.0			7.1	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	41.6	Sum of lost time (s)	10.0
Intersection Capacity Utilization	61.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	SBT
Lane Group Flow (vph)	182	189	960
v/c Ratio	0.37	0.44	0.54
Control Delay	12.4	18.7	7.9
Queue Delay	0.0	0.0	0.0
Total Delay	12.4	18.7	7.9
Queue Length 50th (ft)	21	37	63
Queue Length 95th (ft)	75	103	127
Internal Link Dist (ft)	3983	187	3118
Turn Bay Length (ft)			
Base Capacity (vph)	1140	1110	2899
Starvation Cap Reductn	0	10	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.16	0.17	0.33

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	90	25	0	0	47	13	152	944	7	0	0	0
Future Volume (vph)	90	25	0	0	47	13	152	944	7	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			5.0				
Lane Util. Factor		1.00			1.00			0.95				
Frpb, ped/bikes		1.00			1.00			1.00				
Flpb, ped/bikes		1.00			1.00			1.00				
Frt		1.00			0.97			1.00				
Flt Protected		0.96			1.00			0.99				
Satd. Flow (prot)		1828			1788			3546				
Flt Permitted		0.73			1.00			0.99				
Satd. Flow (perm)		1381			1788			3546				
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	102	28	0	0	53	15	173	1073	8	0	0	0
RTOR Reduction (vph)	0	0	0	0	12	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	130	0	0	56	0	0	1254	0	0	0	0
Confl. Peds. (#/hr)							2		1	1		2
Heavy Vehicles (%)	0%	0%	0%	0%	4%	0%	0%	1%	17%	0%	0%	0%
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		8			4			6				
Permitted Phases	8						6					
Actuated Green, G (s)		8.6			8.6			31.7				
Effective Green, g (s)		8.6			8.6			31.7				
Actuated g/C Ratio		0.17			0.17			0.63				
Clearance Time (s)		5.0			5.0			5.0				
Vehicle Extension (s)		3.0			3.0			3.0				
Lane Grp Cap (vph)		236			305			2234				
v/s Ratio Prot					0.03							
v/s Ratio Perm		c0.09						0.35				
v/c Ratio		0.55			0.18			0.56				
Uniform Delay, d1		19.1			17.8			5.3				
Progression Factor		1.00			1.00			1.00				
Incremental Delay, d2		2.8			0.3			0.3				
Delay (s)		21.9			18.1			5.6				
Level of Service		C			B			A				
Approach Delay (s)		21.9			18.1			5.6			0.0	
Approach LOS		C			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	50.3	Sum of lost time (s)	10.0
Intersection Capacity Utilization	55.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	NBT
Lane Group Flow (vph)	130	68	1254
v/c Ratio	0.45	0.18	0.53
Control Delay	24.3	16.0	7.3
Queue Delay	0.0	0.0	0.0
Total Delay	24.3	16.0	7.3
Queue Length 50th (ft)	31	12	100
Queue Length 95th (ft)	86	43	185
Internal Link Dist (ft)	187	470	1008
Turn Bay Length (ft)			
Base Capacity (vph)	617	806	2826
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.21	0.08	0.44

Intersection Summary

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	23	4	7	12	3	8	6	146	2	4	230	24
Future Vol, veh/h	23	4	7	12	3	8	6	146	2	4	230	24
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	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	4	0	0	0	0	25	50	4	0	50	8	4
Mvmt Flow	26	5	8	14	3	9	7	166	2	5	261	27

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	471	466	275	471	479	167	289	0	0	168	0	0
Stage 1	284	284	-	181	181	-	-	-	-	-	-	-
Stage 2	187	182	-	290	298	-	-	-	-	-	-	-
Critical Hdwy	7.14	6.5	6.2	7.1	6.5	6.45	4.6	-	-	4.6	-	-
Critical Hdwy Stg 1	6.14	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.14	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.536	4	3.3	3.5	4	3.525	2.65	-	-	2.65	-	-
Pot Cap-1 Maneuver	500	497	769	506	489	821	1042	-	-	1165	-	-
Stage 1	719	680	-	825	754	-	-	-	-	-	-	-
Stage 2	810	753	-	722	671	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	487	491	769	493	483	821	1042	-	-	1165	-	-
Mov Cap-2 Maneuver	487	491	-	493	483	-	-	-	-	-	-	-
Stage 1	714	677	-	819	749	-	-	-	-	-	-	-
Stage 2	792	748	-	706	668	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.4	11.6	0.3	0.1
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1042	-	-	527	571	1165	-	-
HCM Lane V/C Ratio	0.007	-	-	0.073	0.046	0.004	-	-
HCM Control Delay (s)	8.5	0	-	12.4	11.6	8.1	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.1	0	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	66	16	98	60	0	0	0	0	134	751	32
Future Volume (vph)	0	66	16	98	60	0	0	0	0	134	751	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0						5.0	
Lane Util. Factor		1.00			1.00						0.95	
Frpb, ped/bikes		0.99			1.00						1.00	
Flpb, ped/bikes		1.00			0.99						0.99	
Frt		0.97			1.00						0.99	
Flt Protected		1.00			0.97						0.99	
Satd. Flow (prot)		1810			1826						3503	
Flt Permitted		1.00			0.76						0.99	
Satd. Flow (perm)		1810			1427						3503	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	73	18	109	67	0	0	0	0	149	834	36
RTOR Reduction (vph)	0	13	0	0	0	0	0	0	0	0	3	0
Lane Group Flow (vph)	0	78	0	0	176	0	0	0	0	0	1016	0
Confl. Peds. (#/hr)	21		19	19		21	16		26	26		16
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	0%	2%	0%	0%	0%	0%	0%	0%	0%	1%	1%	3%
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		8			4						2	
Permitted Phases				4						2		
Actuated Green, G (s)		11.5			11.5						23.5	
Effective Green, g (s)		11.5			11.5						23.5	
Actuated g/C Ratio		0.26			0.26						0.52	
Clearance Time (s)		5.0			5.0						5.0	
Vehicle Extension (s)		3.0			3.0						3.0	
Lane Grp Cap (vph)		462			364						1829	
v/s Ratio Prot		0.04										
v/s Ratio Perm					c0.12						0.29	
v/c Ratio		0.17			0.48						0.56	
Uniform Delay, d1		13.0			14.2						7.2	
Progression Factor		1.00			1.00						1.00	
Incremental Delay, d2		0.2			1.0						0.4	
Delay (s)		13.2			15.2						7.6	
Level of Service		B			B						A	
Approach Delay (s)		13.2			15.2			0.0			7.6	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	9.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	45.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	52.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	SBT
Lane Group Flow (vph)	91	176	1019
v/c Ratio	0.19	0.49	0.57
Control Delay	14.0	21.7	9.0
Queue Delay	0.0	0.0	0.0
Total Delay	14.0	21.7	9.0
Queue Length 50th (ft)	15	38	79
Queue Length 95th (ft)	51	106	158
Internal Link Dist (ft)	369	175	1004
Turn Bay Length (ft)			
Base Capacity (vph)	1061	827	2743
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.09	0.21	0.37

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	150	0	0	126	387	30	735	36	0	0	0
Future Volume (vph)	44	150	0	0	126	387	30	735	36	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			5.0				
Lane Util. Factor		1.00			1.00			0.95				
Frpb, ped/bikes		1.00			0.99			1.00				
Flpb, ped/bikes		1.00			1.00			1.00				
Frt		1.00			0.90			0.99				
Flt Protected		0.99			1.00			1.00				
Satd. Flow (prot)		1851			1642			3575				
Flt Permitted		0.70			1.00			1.00				
Satd. Flow (perm)		1308			1642			3575				
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	49	167	0	0	140	430	33	817	40	0	0	0
RTOR Reduction (vph)	0	0	0	0	46	0	0	5	0	0	0	0
Lane Group Flow (vph)	0	216	0	0	524	0	0	885	0	0	0	0
Confl. Peds. (#/hr)	2		3	3		2	1		1	1		1
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	3%	1%	0%	0%	2%	3%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		8			4			6				
Permitted Phases	8						6					
Actuated Green, G (s)		22.5			22.5			21.6				
Effective Green, g (s)		22.5			22.5			21.6				
Actuated g/C Ratio		0.42			0.42			0.40				
Clearance Time (s)		5.0			5.0			5.0				
Vehicle Extension (s)		3.0			3.0			3.0				
Lane Grp Cap (vph)		543			682			1427				
v/s Ratio Prot					c0.32							
v/s Ratio Perm		0.17						0.25				
v/c Ratio		0.40			0.77			0.62				
Uniform Delay, d1		11.1			13.6			13.0				
Progression Factor		1.00			1.00			1.00				
Incremental Delay, d2		0.5			5.2			0.8				
Delay (s)		11.5			18.8			13.8				
Level of Service		B			B			B				
Approach Delay (s)		11.5			18.8			13.8			0.0	
Approach LOS		B			B			B			A	

Intersection Summary			
HCM 2000 Control Delay	15.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	54.1	Sum of lost time (s)	10.0
Intersection Capacity Utilization	79.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	NBT
Lane Group Flow (vph)	216	570	890
v/c Ratio	0.40	0.79	0.63
Control Delay	14.7	22.0	16.3
Queue Delay	0.1	0.0	0.0
Total Delay	14.8	22.0	16.3
Queue Length 50th (ft)	47	131	117
Queue Length 95th (ft)	110	291	206
Internal Link Dist (ft)	175	838	646
Turn Bay Length (ft)			
Base Capacity (vph)	791	1023	2025
Starvation Cap Reductn	107	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.32	0.56	0.44

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	61	118	95	393	297	155	286	1387	268	120	1190	31
Future Volume (vph)	61	118	95	393	297	155	286	1387	268	120	1190	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	5.0		4.5	5.0		4.5	6.0	6.0	4.5	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.93		1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1745		1752	1743		1770	3374	1538	1787	3374	1615
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1745		1752	1743		1770	3374	1538	1787	3374	1615
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	64	124	100	414	313	163	301	1460	282	126	1253	33
RTOR Reduction (vph)	0	21	0	0	13	0	0	0	166	0	0	22
Lane Group Flow (vph)	64	203	0	414	463	0	301	1460	116	126	1253	11
Confl. Peds. (#/hr)			1	1								
Heavy Vehicles (%)	2%	1%	1%	3%	1%	8%	2%	7%	5%	1%	7%	0%
Turn Type	Prot	NA		Prot	NA		Prot	NA	Prot	Prot	NA	Perm
Protected Phases	3	8		7	4		1	6	6	5	2	
Permitted Phases												2
Actuated Green, G (s)	7.3	26.6		24.6	43.9		22.6	57.3	57.3	10.5	45.2	45.2
Effective Green, g (s)	7.3	26.6		24.6	43.9		22.6	57.3	57.3	10.5	45.2	45.2
Actuated g/C Ratio	0.05	0.19		0.18	0.32		0.16	0.41	0.41	0.08	0.33	0.33
Clearance Time (s)	4.5	5.0		4.5	5.0		4.5	6.0	6.0	4.5	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	92	333		310	550		287	1390	634	134	1097	525
v/s Ratio Prot	0.04	0.12		c0.24	c0.27		c0.17	0.43	0.08	0.07	c0.37	
v/s Ratio Perm												0.01
v/c Ratio	0.70	0.61		1.34	0.84		1.05	1.05	0.18	0.94	1.14	0.02
Uniform Delay, d1	64.8	51.4		57.2	44.3		58.2	40.9	26.0	63.9	46.9	31.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	20.4	3.2		171.3	11.2		66.5	38.5	0.1	59.5	75.2	0.0
Delay (s)	85.2	54.6		228.5	55.5		124.7	79.4	26.1	123.4	122.1	31.9
Level of Service	F	D		F	E		F	E	C	F	F	C
Approach Delay (s)		61.4			136.0			78.7			120.1	
Approach LOS		E			F			E			F	

Intersection Summary			
HCM 2000 Control Delay	101.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	139.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	99.9%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	64	224	414	476	301	1460	282	126	1253	33
v/c Ratio	0.58	0.65	1.33	0.84	1.04	1.04	0.35	0.93	1.13	0.05
Control Delay	85.7	54.3	211.2	56.9	119.4	75.9	4.5	123.1	114.4	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	85.7	54.3	211.2	56.9	119.4	75.9	4.5	123.1	114.4	0.2
Queue Length 50th (ft)	57	166	~483	396	~293	~751	0	115	~691	0
Queue Length 95th (ft)	#120	254	#765	540	#536	#1014	60	#267	#937	0
Internal Link Dist (ft)		838		3278		1074			1019	
Turn Bay Length (ft)	150		450		275		575	350		100
Base Capacity (vph)	122	501	312	684	289	1399	802	136	1104	626
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.45	1.33	0.70	1.04	1.04	0.35	0.93	1.13	0.05

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	57	1519	0	0	0	0	0	39	33
Future Volume (vph)	0	0	0	57	1519	0	0	0	0	0	39	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.5						4.5	
Lane Util. Factor					0.95						0.95	
Frpb, ped/bikes					1.00						0.99	
Flpb, ped/bikes					1.00						1.00	
Frt					1.00						0.93	
Flt Protected					1.00						1.00	
Satd. Flow (prot)					3535						3336	
Flt Permitted					1.00						1.00	
Satd. Flow (perm)					3535						3336	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	62	1651	0	0	0	0	0	42	36
RTOR Reduction (vph)	0	0	0	0	3	0	0	0	0	0	33	0
Lane Group Flow (vph)	0	0	0	0	1710	0	0	0	0	0	45	0
Confl. Peds. (#/hr)	3		1	1		3	3		2	2		3
Heavy Vehicles (%)	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%
Turn Type				Perm	NA						NA	
Protected Phases					6						4	
Permitted Phases				6								
Actuated Green, G (s)					55.7						5.1	
Effective Green, g (s)					55.7						5.1	
Actuated g/C Ratio					0.80						0.07	
Clearance Time (s)					4.5						4.5	
Vehicle Extension (s)					3.0						3.0	
Lane Grp Cap (vph)					2820						243	
v/s Ratio Prot											c0.01	
v/s Ratio Perm					0.48							
v/c Ratio					0.61						0.18	
Uniform Delay, d1					2.8						30.4	
Progression Factor					1.00						1.00	
Incremental Delay, d2					0.4						0.4	
Delay (s)					3.1						30.8	
Level of Service					A						C	
Approach Delay (s)		0.0			3.1			0.0			30.8	
Approach LOS		A			A			A			C	

Intersection Summary			
HCM 2000 Control Delay	4.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	69.8	Sum of lost time (s)	9.0
Intersection Capacity Utilization	60.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBT	SBT
Lane Group Flow (vph)	1713	78
v/c Ratio	0.58	0.21
Control Delay	3.8	22.3
Queue Delay	0.1	0.0
Total Delay	4.0	22.3
Queue Length 50th (ft)	114	9
Queue Length 95th (ft)	175	32
Internal Link Dist (ft)	472	448
Turn Bay Length (ft)		
Base Capacity (vph)	3379	977
Starvation Cap Reductn	545	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.60	0.08

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	1110	21	405	145	0	0	0	0
Future Volume (vph)	0	0	0	0	1110	21	405	145	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.5		4.5	4.5				
Lane Util. Factor					0.95		0.91	0.91				
Frpb, ped/bikes					1.00		1.00	1.00				
Flpb, ped/bikes					1.00		1.00	1.00				
Frt					1.00		1.00	1.00				
Flt Protected					1.00		0.95	0.97				
Satd. Flow (prot)					3530		1609	3320				
Flt Permitted					1.00		0.95	0.97				
Satd. Flow (perm)					3530		1609	3320				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	1207	23	440	158	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	1	0	49	49	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	1229	0	171	329	0	0	0	0
Confl. Peds. (#/hr)	3					3	1					1
Heavy Vehicles (%)	0%	0%	0%	0%	2%	0%	2%	0%	0%	0%	0%	0%
Turn Type					NA		Perm	NA				
Protected Phases					6			8				
Permitted Phases							8					
Actuated Green, G (s)					29.9		13.5	13.5				
Effective Green, g (s)					29.9		13.5	13.5				
Actuated g/C Ratio					0.57		0.26	0.26				
Clearance Time (s)					4.5		4.5	4.5				
Vehicle Extension (s)					3.0		3.0	3.0				
Lane Grp Cap (vph)					2014		414	855				
v/s Ratio Prot					c0.35							
v/s Ratio Perm							c0.11	0.10				
v/c Ratio					0.61		0.41	0.38				
Uniform Delay, d1					7.4		16.2	16.0				
Progression Factor					1.00		1.00	1.00				
Incremental Delay, d2					0.6		0.7	0.3				
Delay (s)					8.0		16.8	16.3				
Level of Service					A		B	B				
Approach Delay (s)		0.0			8.0			16.5			0.0	
Approach LOS		A			A			B			A	

Intersection Summary			
HCM 2000 Control Delay	10.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	52.4	Sum of lost time (s)	9.0
Intersection Capacity Utilization	82.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBT	NBL	NBT
Lane Group Flow (vph)	1230	220	378
v/c Ratio	0.62	0.48	0.42
Control Delay	9.6	17.2	16.2
Queue Delay	0.0	0.0	0.0
Total Delay	9.6	17.2	16.2
Queue Length 50th (ft)	110	40	41
Queue Length 95th (ft)	237	131	103
Internal Link Dist (ft)	765		275
Turn Bay Length (ft)			
Base Capacity (vph)	3319	1117	2283
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.37	0.20	0.17

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	124	651	0	0	0	0	0	710	378
Future Volume (vph)	0	0	0	124	651	0	0	0	0	0	710	378
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.5						4.5	
Lane Util. Factor					0.95						0.95	
Frpb, ped/bikes					1.00						0.99	
Flpb, ped/bikes					1.00						1.00	
Frt					1.00						0.95	
Flt Protected					0.99						1.00	
Satd. Flow (prot)					3492						3382	
Flt Permitted					0.99						1.00	
Satd. Flow (perm)					3492						3382	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	0	0	133	700	0	0	0	0	0	763	406
RTOR Reduction (vph)	0	0	0	0	16	0	0	0	0	0	41	0
Lane Group Flow (vph)	0	0	0	0	817	0	0	0	0	0	1128	0
Confl. Peds. (#/hr)			2	2			2		2	2		2
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	0%	0%	0%	0%	3%	0%	0%	0%	0%	0%	1%	0%
Turn Type				Perm	NA						NA	
Protected Phases					6						4	
Permitted Phases				6								
Actuated Green, G (s)					25.3						36.8	
Effective Green, g (s)					25.3						36.8	
Actuated g/C Ratio					0.36						0.52	
Clearance Time (s)					4.5						4.5	
Vehicle Extension (s)					3.0						3.0	
Lane Grp Cap (vph)					1242						1750	
v/s Ratio Prot											c0.33	
v/s Ratio Perm					0.23							
v/c Ratio					0.66						0.64	
Uniform Delay, d1					19.3						12.4	
Progression Factor					1.00						1.00	
Incremental Delay, d2					1.3						0.8	
Delay (s)					20.5						13.2	
Level of Service					C						B	
Approach Delay (s)		0.0			20.5			0.0			13.2	
Approach LOS		A			C			A			B	

Intersection Summary			
HCM 2000 Control Delay	16.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	71.1	Sum of lost time (s)	9.0
Intersection Capacity Utilization	60.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBT	SBT
Lane Group Flow (vph)	833	1169
v/c Ratio	0.67	0.66
Control Delay	23.2	14.2
Queue Delay	0.3	0.0
Total Delay	23.5	14.2
Queue Length 50th (ft)	152	167
Queue Length 95th (ft)	288	303
Internal Link Dist (ft)	179	644
Turn Bay Length (ft)		
Base Capacity (vph)	1916	2660
Starvation Cap Reductn	448	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.57	0.44

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	684	326	73	701	0	0	0	0
Future Volume (vph)	0	0	0	0	684	326	73	701	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.5	4.5	4.5	4.5				
Lane Util. Factor					0.95	1.00	0.91	0.91				
Frpb, ped/bikes					1.00	0.99	1.00	1.00				
Flpb, ped/bikes					1.00	1.00	1.00	1.00				
Frt					1.00	0.85	1.00	1.00				
Flt Protected					1.00	1.00	0.95	1.00				
Satd. Flow (prot)					3505	1563	1643	3456				
Flt Permitted					1.00	1.00	0.95	1.00				
Satd. Flow (perm)					3505	1563	1643	3456				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	743	354	79	762	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	81	29	10	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	743	273	42	760	0	0	0	0
Confl. Peds. (#/hr)	1					1			1	1		
Heavy Vehicles (%)	0%	0%	0%	0%	3%	2%	0%	0%	0%	0%	0%	0%
Turn Type					NA	Perm	Perm	NA				
Protected Phases					4			6				
Permitted Phases						4	6					
Actuated Green, G (s)					22.9	22.9	21.3	21.3				
Effective Green, g (s)					22.9	22.9	21.3	21.3				
Actuated g/C Ratio					0.43	0.43	0.40	0.40				
Clearance Time (s)					4.5	4.5	4.5	4.5				
Vehicle Extension (s)					3.0	3.0	3.0	3.0				
Lane Grp Cap (vph)					1508	672	657	1383				
v/s Ratio Prot					c0.21							
v/s Ratio Perm						0.17	0.03	0.22				
v/c Ratio					0.49	0.41	0.06	0.55				
Uniform Delay, d1					11.0	10.5	9.8	12.3				
Progression Factor					1.00	1.00	1.00	1.00				
Incremental Delay, d2					0.3	0.4	0.0	0.5				
Delay (s)					11.2	10.9	9.9	12.7				
Level of Service					B	B	A	B				
Approach Delay (s)		0.0			11.1			12.5			0.0	
Approach LOS		A			B			B			A	

Intersection Summary			
HCM 2000 Control Delay	11.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	53.2	Sum of lost time (s)	9.0
Intersection Capacity Utilization	68.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBT	WBR	NBL	NBT
Lane Group Flow (vph)	743	354	71	770
v/c Ratio	0.50	0.48	0.10	0.56
Control Delay	13.2	9.5	6.4	14.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	13.2	9.5	6.4	14.8
Queue Length 50th (ft)	82	40	4	92
Queue Length 95th (ft)	170	128	31	198
Internal Link Dist (ft)	478			255
Turn Bay Length (ft)		125	75	
Base Capacity (vph)	2772	1265	1452	3044
Starvation Cap Reductn	0	0	0	129
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.27	0.28	0.05	0.26

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR	SBR2	SEL	SER
Lane Configurations									
Traffic Volume (vph)	510	213	506	1464	1235	454	0	0	0
Future Volume (vph)	510	213	506	1464	1235	454	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	5.5	5.5				
Lane Util. Factor	0.97	1.00	0.97	0.95	0.95				
Frpb, ped/bikes	1.00	1.00	1.00	1.00	0.99				
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00				
Frt	1.00	0.85	1.00	1.00	0.96				
Flt Protected	0.95	1.00	0.95	1.00	1.00				
Satd. Flow (prot)	3400	1599	3433	3438	3275				
Flt Permitted	0.95	1.00	0.95	1.00	1.00				
Satd. Flow (perm)	3400	1599	3433	3438	3275				
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.92	0.92	0.92
Adj. Flow (vph)	537	224	533	1541	1300	478	0	0	0
RTOR Reduction (vph)	0	180	0	0	0	0	0	0	0
Lane Group Flow (vph)	537	44	533	1541	1778	0	0	0	0
Confl. Bikes (#/hr)						1			
Heavy Vehicles (%)	3%	1%	2%	5%	6%	3%	2%	2%	2%
Turn Type	Prot	Perm	Prot	NA	NA		Perm		
Protected Phases	8		1	6	2				
Permitted Phases		3					2		
Actuated Green, G (s)	26.3	26.3	25.5	97.0	67.0				
Effective Green, g (s)	26.3	26.3	25.5	97.0	67.0				
Actuated g/C Ratio	0.20	0.20	0.19	0.73	0.50				
Clearance Time (s)	4.5	4.5	4.5	5.5	5.5				
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0				
Lane Grp Cap (vph)	670	315	656	2501	1646				
v/s Ratio Prot	c0.16		c0.16	0.45	c0.54				
v/s Ratio Perm		0.03							
v/c Ratio	0.80	0.14	0.81	0.62	1.08				
Uniform Delay, d1	51.0	44.2	51.6	9.0	33.2				
Progression Factor	1.00	1.00	1.00	1.00	1.00				
Incremental Delay, d2	6.9	0.2	7.6	0.5	47.3				
Delay (s)	57.9	44.4	59.2	9.4	80.5				
Level of Service	E	D	E	A	F				
Approach Delay (s)	53.9			22.2	80.5			0.0	
Approach LOS	D			C	F			A	

Intersection Summary			
HCM 2000 Control Delay	49.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	133.3	Sum of lost time (s)	14.5
Intersection Capacity Utilization	89.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	537	224	533	1541	1778
v/c Ratio	0.80	0.45	0.81	0.62	1.08
Control Delay	61.1	8.6	62.5	10.8	80.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	61.2	8.6	62.5	10.8	80.7
Queue Length 50th (ft)	230	0	228	309	~905
Queue Length 95th (ft)	310	69	313	460	#1235
Internal Link Dist (ft)	383			2738	1074
Turn Bay Length (ft)		200	325		
Base Capacity (vph)	936	602	841	2685	1643
Starvation Cap Reductn	17	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.58	0.37	0.63	0.57	1.08

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	165	676	52	145	637	114	27	266	102	47	104	111
Future Vol, veh/h	165	676	52	145	637	114	27	266	102	47	104	111
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	500	-	-	525	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	5	5	3	3	0	0	0	1	0	8	0
Mvmt Flow	176	719	55	154	678	121	29	283	109	50	111	118

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	799	0	0	774	0	0	2259	2205	747	2341	2173	738
Stage 1	-	-	-	-	-	-	1098	1098	-	1047	1047	-
Stage 2	-	-	-	-	-	-	1161	1107	-	1294	1126	-
Critical Hdwy	4.1	-	-	4.13	-	-	7.1	6.5	6.21	7.1	6.58	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.58	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.58	-
Follow-up Hdwy	2.2	-	-	2.227	-	-	3.5	4	3.309	3.5	4.072	3.3
Pot Cap-1 Maneuver	833	-	-	837	-	-	30	~ 45	415	~ 26	~ 45	421
Stage 1	-	-	-	-	-	-	260	291	-	278	298	-
Stage 2	-	-	-	-	-	-	240	288	-	202	273	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	833	-	-	837	-	-	-	~ 29	415	-	~ 29	421
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	~ 29	-	-	~ 29	-
Stage 1	-	-	-	-	-	-	205	~ 230	-	219	243	-
Stage 2	-	-	-	-	-	-	77	~ 235	-	-	215	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.9	1.7		
HCM LOS			-	-

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	833	-	-	837	-	-	-
HCM Lane V/C Ratio	-	0.211	-	-	0.184	-	-	-
HCM Control Delay (s)	-	10.5	-	-	10.3	-	-	-
HCM Lane LOS	-	B	-	-	B	-	-	-
HCM 95th %tile Q(veh)	-	0.8	-	-	0.7	-	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	132	733	56	181	812	123	103	273	135	150	234	70
Future Volume (vph)	132	733	56	181	812	123	103	273	135	150	234	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.7	5.0		4.7	5.0		4.7	5.0		4.7	5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.98		1.00	0.95		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1805	1812		1805	1810		1718	1763		1769	1881	1531
Flt Permitted	0.10	1.00		0.09	1.00		0.42	1.00		0.17	1.00	1.00
Satd. Flow (perm)	187	1812		169	1810		754	1763		324	1881	1531
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	139	772	59	191	855	129	108	287	142	158	246	74
RTOR Reduction (vph)	0	3	0	0	6	0	0	18	0	0	0	57
Lane Group Flow (vph)	139	828	0	191	979	0	108	411	0	158	246	17
Confl. Peds. (#/hr)	1					1	1		1	1		1
Confl. Bikes (#/hr)						1						1
Heavy Vehicles (%)	0%	4%	0%	0%	3%	0%	5%	2%	1%	2%	1%	3%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		4
Actuated Green, G (s)	47.0	40.7		55.6	45.0		29.3	23.0		29.3	23.0	23.0
Effective Green, g (s)	47.0	40.7		55.6	45.0		29.3	23.0		29.3	23.0	23.0
Actuated g/C Ratio	0.47	0.41		0.56	0.45		0.29	0.23		0.29	0.23	0.23
Clearance Time (s)	4.7	5.0		4.7	5.0		4.7	5.0		4.7	5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	189	737		267	814		281	405		185	432	352
v/s Ratio Prot	0.05	0.46		c0.08	c0.54		0.02	c0.23		c0.05	0.13	
v/s Ratio Perm	0.30			0.32			0.09			0.20		0.01
v/c Ratio	0.74	1.12		0.72	1.20		0.38	1.02		0.85	0.57	0.05
Uniform Delay, d1	22.5	29.6		23.0	27.5		27.0	38.5		30.8	34.1	30.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	13.8	72.6		8.8	102.6		0.9	48.7		29.8	1.7	0.1
Delay (s)	36.3	102.2		31.7	130.1		27.8	87.2		60.5	35.8	30.0
Level of Service	D	F		C	F		C	F		E	D	C
Approach Delay (s)		92.8			114.1			75.3			43.1	
Approach LOS		F			F			E			D	

Intersection Summary			
HCM 2000 Control Delay	90.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	19.4
Intersection Capacity Utilization	104.6%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	139	831	191	984	108	429	158	246	74
v/c Ratio	0.74	1.12	0.72	1.20	0.38	1.02	0.84	0.57	0.15
Control Delay	41.0	102.0	33.8	129.6	27.8	85.6	63.6	40.1	0.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.0	102.0	33.8	129.6	27.8	85.6	63.6	40.1	0.7
Queue Length 50th (ft)	39	~624	64	~767	48	~269	72	140	0
Queue Length 95th (ft)	#133	#872	138	#1013	89	#470	#161	220	0
Internal Link Dist (ft)		5185		2015		2675		2548	
Turn Bay Length (ft)	225		275		125		150		150
Base Capacity (vph)	189	740	296	819	283	422	187	432	487
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.74	1.12	0.65	1.20	0.38	1.02	0.84	0.57	0.15

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	132	850	10	365	1009	414	18	222	219	266	194	83
Future Volume (vph)	132	850	10	365	1009	414	18	222	219	266	194	83
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1719	3499		1805	1881	1529	1804	1881	1594	1805	1881	1578
Flt Permitted	0.13	1.00		0.12	1.00	1.00	0.63	1.00	1.00	0.35	1.00	1.00
Satd. Flow (perm)	240	3499		236	1881	1529	1194	1881	1594	668	1881	1578
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	140	904	11	388	1073	440	19	236	233	283	206	88
RTOR Reduction (vph)	0	1	0	0	0	148	0	0	182	0	0	65
Lane Group Flow (vph)	140	914	0	388	1073	292	19	236	51	283	206	23
Confl. Peds. (#/hr)	3		2	2		3	1		1	1		1
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	5%	3%	0%	0%	1%	3%	0%	1%	0%	0%	1%	0%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6		6	8		8	4		4
Actuated Green, G (s)	36.6	30.1		48.1	37.1	37.1	21.5	19.0	19.0	29.5	23.0	23.0
Effective Green, g (s)	36.6	30.1		48.1	37.1	37.1	21.5	19.0	19.0	29.5	23.0	23.0
Actuated g/C Ratio	0.42	0.35		0.55	0.43	0.43	0.25	0.22	0.22	0.34	0.26	0.26
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	211	1209		373	801	651	312	410	347	311	496	416
v/s Ratio Prot	0.05	0.26		c0.16	c0.57		0.00	0.13		c0.07	0.11	
v/s Ratio Perm	0.23			0.41		0.19	0.01		0.03	c0.24		0.01
v/c Ratio	0.66	0.76		1.04	1.34	0.45	0.06	0.58	0.15	0.91	0.42	0.06
Uniform Delay, d1	20.2	25.3		23.6	25.0	17.7	25.0	30.4	27.5	27.1	26.5	23.9
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	7.6	2.7		57.4	161.2	0.5	0.1	2.0	0.2	28.7	0.6	0.1
Delay (s)	27.8	28.0		81.0	186.2	18.2	25.0	32.4	27.7	55.8	27.1	24.0
Level of Service	C	C		F	F	B	C	C	C	E	C	C
Approach Delay (s)		28.0			125.9			29.9			40.7	
Approach LOS		C			F			C			D	

Intersection Summary			
HCM 2000 Control Delay	76.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.22		
Actuated Cycle Length (s)	87.1	Sum of lost time (s)	18.0
Intersection Capacity Utilization	102.3%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	140	915	388	1073	440	19	236	233	283	206	88
v/c Ratio	0.64	0.73	1.01	1.30	0.54	0.05	0.66	0.47	0.98	0.40	0.16
Control Delay	29.0	28.7	71.2	167.7	10.2	19.2	40.3	7.4	77.0	29.0	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.0	28.7	71.2	167.7	10.2	19.2	40.3	7.4	77.0	29.0	0.6
Queue Length 50th (ft)	31	215	148	~727	58	7	116	0	119	82	0
Queue Length 95th (ft)	#113	328	#382	#1086	166	21	189	55	#269	165	1
Internal Link Dist (ft)		2015		1820			1014			2700	
Turn Bay Length (ft)	225		200			200		175	250		250
Base Capacity (vph)	218	1247	386	827	816	368	715	750	289	715	701
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.73	1.01	1.30	0.54	0.05	0.33	0.31	0.98	0.29	0.13

Intersection Summary

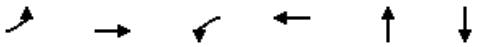
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	47	1099	57	51	1392	52	253	85	86	39	36	82
Future Volume (vph)	47	1099	57	51	1392	52	253	85	86	39	36	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.99		1.00	0.99			0.97			0.93	
Flt Protected	0.95	1.00		0.95	1.00			0.97			0.99	
Satd. Flow (prot)	1805	3480		1805	3520			1761			1702	
Flt Permitted	0.09	1.00		0.12	1.00			0.71			0.85	
Satd. Flow (perm)	163	3480		223	3520			1288			1471	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	51	1195	62	55	1513	57	275	92	93	42	39	89
RTOR Reduction (vph)	0	0	0	0	2	0	0	0	0	0	10	0
Lane Group Flow (vph)	51	1257	0	55	1568	0	0	460	0	0	160	0
Confl. Peds. (#/hr)	1		8	8		1	6		1	1		6
Heavy Vehicles (%)	0%	3%	0%	0%	2%	0%	1%	3%	0%	0%	0%	3%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	46.6	46.6		46.6	46.6			36.7			36.7	
Effective Green, g (s)	46.6	46.6		46.6	46.6			36.7			36.7	
Actuated g/C Ratio	0.51	0.51		0.51	0.51			0.40			0.40	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	83	1776		113	1796			517			591	
v/s Ratio Prot		0.36			c0.45							
v/s Ratio Perm	0.31			0.25				c0.36			0.11	
v/c Ratio	0.61	0.71		0.49	0.87			0.89			0.27	
Uniform Delay, d1	15.9	17.1		14.6	19.7			25.4			18.3	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	12.8	1.3		3.3	5.0			16.9			0.2	
Delay (s)	28.7	18.4		17.8	24.7			42.3			18.6	
Level of Service	C	B		B	C			D			B	
Approach Delay (s)		18.8			24.5			42.3			18.6	
Approach LOS		B			C			D			B	

Intersection Summary			
HCM 2000 Control Delay	24.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	91.3	Sum of lost time (s)	8.0
Intersection Capacity Utilization	79.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	51	1257	55	1570	460	170
v/c Ratio	0.62	0.71	0.49	0.87	0.89	0.28
Control Delay	55.7	20.9	35.4	27.8	47.2	18.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.7	20.9	35.4	27.8	47.2	18.3
Queue Length 50th (ft)	23	314	22	451	254	61
Queue Length 95th (ft)	#92	407	#81	#632	#438	109
Internal Link Dist (ft)		1820		1191	423	675
Turn Bay Length (ft)	125		125			
Base Capacity (vph)	89	1907	121	1931	619	715
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.66	0.45	0.81	0.74	0.24

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	895	389	0	0	0	0	0	0	14	87	0
Future Volume (vph)	0	895	389	0	0	0	0	0	0	14	87	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5									4.0	
Lane Util. Factor		0.95									0.95	
Frpb, ped/bikes		1.00									1.00	
Flpb, ped/bikes		1.00									1.00	
Frt		0.95									1.00	
Flt Protected		1.00									0.99	
Satd. Flow (prot)		3365									3586	
Flt Permitted		1.00									0.99	
Satd. Flow (perm)		3365									3586	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	973	423	0	0	0	0	0	0	15	95	0
RTOR Reduction (vph)	0	43	0	0	0	0	0	0	0	0	14	0
Lane Group Flow (vph)	0	1353	0	0	0	0	0	0	0	0	96	0
Confl. Peds. (#/hr)							3					3
Confl. Bikes (#/hr)			2									
Heavy Vehicles (%)	0%	2%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type		NA								Perm	NA	
Protected Phases		2									4	
Permitted Phases										4		
Actuated Green, G (s)		37.7									5.5	
Effective Green, g (s)		37.7									5.5	
Actuated g/C Ratio		0.73									0.11	
Clearance Time (s)		4.5									4.0	
Vehicle Extension (s)		3.0									3.0	
Lane Grp Cap (vph)		2453									381	
v/s Ratio Prot		c0.40										
v/s Ratio Perm											0.03	
v/c Ratio		0.55									0.25	
Uniform Delay, d1		3.2									21.2	
Progression Factor		1.00									1.00	
Incremental Delay, d2		0.3									0.3	
Delay (s)		3.4									21.6	
Level of Service		A									C	
Approach Delay (s)		3.4			0.0			0.0			21.6	
Approach LOS		A			A			A			C	

Intersection Summary			
HCM 2000 Control Delay	4.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	51.7	Sum of lost time (s)	8.5
Intersection Capacity Utilization	50.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	SBT
Lane Group Flow (vph)	1396	110
v/c Ratio	0.53	0.21
Control Delay	4.0	20.0
Queue Delay	0.0	0.0
Total Delay	4.0	20.0
Queue Length 50th (ft)	67	13
Queue Length 95th (ft)	118	36
Internal Link Dist (ft)	1097	269
Turn Bay Length (ft)		
Base Capacity (vph)	3367	1616
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.41	0.07

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	910	0	0	0	0	0	505	144	0	0	0
Future Volume (vph)	40	910	0	0	0	0	0	505	144	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5						4.5	4.5			
Lane Util. Factor		0.95						0.95	1.00			
Frpb, ped/bikes		1.00						1.00	1.00			
Flpb, ped/bikes		1.00						1.00	1.00			
Frt		1.00						1.00	0.85			
Flt Protected		1.00						1.00	1.00			
Satd. Flow (prot)		3529						3539	1615			
Flt Permitted		1.00						1.00	1.00			
Satd. Flow (perm)		3529						3539	1615			
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	43	978	0	0	0	0	0	543	155	0	0	0
RTOR Reduction (vph)	0	8	0	0	0	0	0	0	63	0	0	0
Lane Group Flow (vph)	0	1013	0	0	0	0	0	543	92	0	0	0
Confl. Peds. (#/hr)							2					2
Heavy Vehicles (%)	4%	2%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%
Turn Type	Perm	NA						NA	Perm			
Protected Phases		2						8				
Permitted Phases	2								8			
Actuated Green, G (s)		23.9						15.4	15.4			
Effective Green, g (s)		23.9						15.4	15.4			
Actuated g/C Ratio		0.49						0.32	0.32			
Clearance Time (s)		4.5						4.5	4.5			
Vehicle Extension (s)		3.0						3.0	3.0			
Lane Grp Cap (vph)		1746						1128	514			
v/s Ratio Prot								c0.15				
v/s Ratio Perm		0.29							0.06			
v/c Ratio		0.58						0.48	0.18			
Uniform Delay, d1		8.6						13.2	11.9			
Progression Factor		1.00						1.00	1.00			
Incremental Delay, d2		0.5						0.3	0.2			
Delay (s)		9.1						13.6	12.1			
Level of Service		A						B	B			
Approach Delay (s)		9.1			0.0			13.2			0.0	
Approach LOS		A			A			B			A	

Intersection Summary			
HCM 2000 Control Delay	10.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	48.3	Sum of lost time (s)	9.0
Intersection Capacity Utilization	49.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	NBT	NBR
Lane Group Flow (vph)	1021	543	155
v/c Ratio	0.59	0.49	0.27
Control Delay	10.6	16.1	8.4
Queue Delay	0.0	0.0	0.0
Total Delay	10.6	16.1	8.4
Queue Length 50th (ft)	93	62	12
Queue Length 95th (ft)	186	133	55
Internal Link Dist (ft)	460	568	
Turn Bay Length (ft)			175
Base Capacity (vph)	3350	2857	1321
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.30	0.19	0.12

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱							↰	↑↑	
Traffic Volume (vph)	0	910	68	0	0	0	0	0	0	182	617	0
Future Volume (vph)	0	910	68	0	0	0	0	0	0	182	617	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0							4.0	4.0	
Lane Util. Factor		0.95	1.00							1.00	0.95	
Frpb, ped/bikes		1.00	0.99							1.00	1.00	
Flpb, ped/bikes		1.00	1.00							1.00	1.00	
Frt		1.00	0.85							1.00	1.00	
Flt Protected		1.00	1.00							0.95	1.00	
Satd. Flow (prot)		3539	1595							1799	3574	
Flt Permitted		1.00	1.00							0.95	1.00	
Satd. Flow (perm)		3539	1595							1799	3574	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	958	72	0	0	0	0	0	0	192	649	0
RTOR Reduction (vph)	0	0	29	0	0	0	0	0	0	62	0	0
Lane Group Flow (vph)	0	958	43	0	0	0	0	0	0	130	649	0
Confl. Peds. (#/hr)									4	4		
Confl. Bikes (#/hr)			1									1
Heavy Vehicles (%)	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%
Turn Type		NA	Perm							Perm	NA	
Protected Phases		2									4	
Permitted Phases			2							4		
Actuated Green, G (s)		25.5	25.5							20.1	20.1	
Effective Green, g (s)		25.5	25.5							20.1	20.1	
Actuated g/C Ratio		0.48	0.48							0.38	0.38	
Clearance Time (s)		4.0	4.0							4.0	4.0	
Vehicle Extension (s)		3.0	3.0							3.0	3.0	
Lane Grp Cap (vph)		1683	758							674	1340	
v/s Ratio Prot		c0.27									c0.18	
v/s Ratio Perm			0.03							0.07		
v/c Ratio		0.57	0.06							0.19	0.48	
Uniform Delay, d1		10.1	7.6							11.3	12.8	
Progression Factor		1.00	1.00							1.00	1.00	
Incremental Delay, d2		0.4	0.0							0.1	0.3	
Delay (s)		10.5	7.6							11.4	13.1	
Level of Service		B	A							B	B	
Approach Delay (s)		10.3			0.0			0.0			12.7	
Approach LOS		B			A			A			B	

Intersection Summary			
HCM 2000 Control Delay	11.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	53.6	Sum of lost time (s)	8.0
Intersection Capacity Utilization	60.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	SBL	SBT
Lane Group Flow (vph)	958	72	192	649
v/c Ratio	0.58	0.09	0.26	0.49
Control Delay	12.5	4.5	8.2	15.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	12.5	4.5	8.2	15.3
Queue Length 50th (ft)	102	3	18	76
Queue Length 95th (ft)	215	23	70	166
Internal Link Dist (ft)	782			261
Turn Bay Length (ft)		100	150	
Base Capacity (vph)	3200	1448	1384	2707
Starvation Cap Reductn	0	0	0	130
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.30	0.05	0.14	0.25

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	420	665	0	0	0	0	0	322	51	0	0	0
Future Volume (vph)	420	665	0	0	0	0	0	322	51	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5						4.5				
Lane Util. Factor	0.91	0.91						0.95				
Frt	1.00	1.00						0.98				
Flt Protected	0.95	1.00						1.00				
Satd. Flow (prot)	1643	3381						3536				
Flt Permitted	0.95	1.00						1.00				
Satd. Flow (perm)	1643	3381						3536				
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	452	715	0	0	0	0	0	346	55	0	0	0
RTOR Reduction (vph)	154	8	0	0	0	0	0	15	0	0	0	0
Lane Group Flow (vph)	226	779	0	0	0	0	0	386	0	0	0	0
Heavy Vehicles (%)	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA						NA				
Protected Phases		8						6				
Permitted Phases	8											
Actuated Green, G (s)	21.4	21.4						10.9				
Effective Green, g (s)	21.4	21.4						10.9				
Actuated g/C Ratio	0.52	0.52						0.26				
Clearance Time (s)	4.5	4.5						4.5				
Vehicle Extension (s)	3.0	3.0						3.0				
Lane Grp Cap (vph)	851	1751						933				
v/s Ratio Prot								c0.11				
v/s Ratio Perm	0.14	0.23										
v/c Ratio	0.27	0.45						0.41				
Uniform Delay, d1	5.6	6.2						12.6				
Progression Factor	1.00	1.00						1.00				
Incremental Delay, d2	0.2	0.2						0.3				
Delay (s)	5.7	6.4						12.9				
Level of Service	A	A						B				
Approach Delay (s)		6.2			0.0			12.9			0.0	
Approach LOS		A			A			B			A	

Intersection Summary			
HCM 2000 Control Delay	7.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	41.3	Sum of lost time (s)	9.0
Intersection Capacity Utilization	42.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	NBT
Lane Group Flow (vph)	380	787	401
v/c Ratio	0.38	0.45	0.43
Control Delay	2.6	7.2	14.9
Queue Delay	0.1	0.0	0.0
Total Delay	2.7	7.2	14.9
Queue Length 50th (ft)	6	50	37
Queue Length 95th (ft)	42	106	91
Internal Link Dist (ft)		156	664
Turn Bay Length (ft)	75		
Base Capacity (vph)	1615	3307	3159
Starvation Cap Reductn	286	618	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.29	0.29	0.13

Intersection Summary

Intersection	
Int Delay, s/veh	18.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	91	409	365	137	143	164
Future Vol, veh/h	91	409	365	137	143	164
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	3	4	6	6	4
Mvmt Flow	99	445	397	149	155	178

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	397	0	-	0	1039	397
Stage 1	-	-	-	-	397	-
Stage 2	-	-	-	-	642	-
Critical Hdwy	4.12	-	-	-	6.46	6.24
Critical Hdwy Stg 1	-	-	-	-	5.46	-
Critical Hdwy Stg 2	-	-	-	-	5.46	-
Follow-up Hdwy	2.218	-	-	-	3.554	3.336
Pot Cap-1 Maneuver	1162	-	-	-	251	648
Stage 1	-	-	-	-	671	-
Stage 2	-	-	-	-	517	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1162	-	-	-	223	648
Mov Cap-2 Maneuver	-	-	-	-	223	-
Stage 1	-	-	-	-	671	-
Stage 2	-	-	-	-	459	-

Approach	EB	WB	SB
HCM Control Delay, s	1.5	0	77.5
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1162	-	-	-	343
HCM Lane V/C Ratio	0.085	-	-	-	0.973
HCM Control Delay (s)	8.4	0	-	-	77.5
HCM Lane LOS	A	A	-	-	F
HCM 95th %tile Q(veh)	0.3	-	-	-	10.6

Intersection	
Intersection Delay, s/veh	17.8
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	34	55	36	57	86	5	80	385	32	7	186	70
Future Vol, veh/h	34	55	36	57	86	5	80	385	32	7	186	70
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	3	0	4	0	0	0	3	1	0	0	1	0
Mvmt Flow	38	61	40	63	96	6	89	428	36	8	207	78
Number of Lanes	0	1	0	0	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay	11.8	12.5	22.7	14.5
HCM LOS	B	B	C	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	27%	39%	100%	0%
Vol Thru, %	0%	92%	44%	58%	0%	73%
Vol Right, %	0%	8%	29%	3%	0%	27%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	80	417	125	148	7	256
LT Vol	80	0	34	57	7	0
Through Vol	0	385	55	86	0	186
RT Vol	0	32	36	5	0	70
Lane Flow Rate	89	463	139	164	8	284
Geometry Grp	7	7	2	2	7	7
Degree of Util (X)	0.161	0.76	0.254	0.303	0.015	0.484
Departure Headway (Hd)	6.503	5.906	6.596	6.642	6.913	6.126
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	548	607	547	544	521	583
Service Time	4.288	3.69	4.603	4.642	4.613	3.925
HCM Lane V/C Ratio	0.162	0.763	0.254	0.301	0.015	0.487
HCM Control Delay	10.5	25.1	11.8	12.5	9.7	14.6
HCM Lane LOS	B	D	B	B	A	B
HCM 95th-tile Q	0.6	6.9	1	1.3	0	2.6

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	65	3	25	0	5	14	26	324	11	15	262	129
Future Vol, veh/h	65	3	25	0	5	14	26	324	11	15	262	129
Conflicting Peds, #/hr	4	0	0	0	0	4	2	0	0	0	0	2
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	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	0	0	0	0	1	0	0	0	0
Mvmt Flow	69	3	27	0	5	15	28	345	12	16	279	137

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	801	793	349	800	856	355	418	0	0	356	0	0
Stage 1	381	381	-	406	406	-	-	-	-	-	-	-
Stage 2	420	412	-	394	450	-	-	-	-	-	-	-
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	305	323	699	306	297	693	1152	-	-	1214	-	-
Stage 1	645	617	-	626	601	-	-	-	-	-	-	-
Stage 2	615	598	-	635	575	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	282	307	698	281	282	690	1152	-	-	1209	-	-
Mov Cap-2 Maneuver	282	307	-	281	282	-	-	-	-	-	-	-
Stage 1	624	605	-	607	583	-	-	-	-	-	-	-
Stage 2	576	580	-	597	564	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	20.1	12.5	0.6	0.3
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1152	-	-	337	500	1209	-	-
HCM Lane V/C Ratio	0.024	-	-	0.294	0.04	0.013	-	-
HCM Control Delay (s)	8.2	0	-	20.1	12.5	8	0	-
HCM Lane LOS	A	A	-	C	B	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	1.2	0.1	0	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	218	134	131	364	204	132	275	86	189	379	11
Future Volume (vph)	10	218	134	131	364	204	132	275	86	189	379	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1803	1845	1599	1787	3505	1561	1787	1881	1568	3467	1873	
Flt Permitted	0.53	1.00	1.00	0.40	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1000	1845	1599	754	3505	1561	1787	1881	1568	3467	1873	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	10	227	140	136	379	212	138	286	90	197	395	11
RTOR Reduction (vph)	0	0	84	0	0	141	0	0	53	0	1	0
Lane Group Flow (vph)	10	227	56	136	379	72	138	286	37	197	405	0
Confl. Peds. (#/hr)	3					3	3		1	1		3
Heavy Vehicles (%)	0%	3%	1%	1%	3%	1%	1%	1%	2%	1%	1%	0%
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	Perm	Prot	NA	pm+ov	Prot	NA	
Protected Phases	5	2	3	1	6		3	8	1	7	4	
Permitted Phases	2		2	6		6			8			
Actuated Green, G (s)	19.4	18.4	29.1	29.5	24.5	24.5	10.7	22.7	29.8	8.6	20.6	
Effective Green, g (s)	19.4	18.4	29.1	29.5	24.5	24.5	10.7	22.7	29.8	8.6	20.6	
Actuated g/C Ratio	0.27	0.25	0.40	0.41	0.34	0.34	0.15	0.31	0.41	0.12	0.28	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	277	466	727	406	1179	525	262	586	728	409	529	
v/s Ratio Prot	0.00	c0.12	0.01	c0.03	0.11		c0.08	0.15	0.00	0.06	c0.22	
v/s Ratio Perm	0.01		0.02	0.10		0.05			0.02			
v/c Ratio	0.04	0.49	0.08	0.33	0.32	0.14	0.53	0.49	0.05	0.48	0.77	
Uniform Delay, d1	19.7	23.2	13.5	14.4	18.0	16.8	28.7	20.3	13.0	30.0	23.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.1	0.8	0.0	0.5	0.2	0.1	1.9	0.6	0.0	0.9	6.5	
Delay (s)	19.7	24.0	13.6	14.9	18.1	16.9	30.6	21.0	13.0	30.9	30.4	
Level of Service	B	C	B	B	B	B	C	C	B	C	C	
Approach Delay (s)		20.0			17.2			22.2			30.6	
Approach LOS		C			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	22.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	72.8	Sum of lost time (s)	16.0
Intersection Capacity Utilization	60.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	10	227	140	136	379	213	138	286	90	197	406
v/c Ratio	0.03	0.58	0.18	0.36	0.31	0.31	0.50	0.47	0.12	0.46	0.74
Control Delay	17.5	33.2	3.5	20.4	20.2	5.3	37.1	21.4	3.0	35.8	31.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.5	33.2	3.5	20.4	20.2	5.3	37.1	21.4	3.0	35.8	31.6
Queue Length 50th (ft)	3	87	0	38	57	0	54	94	0	40	152
Queue Length 95th (ft)	14	186	32	96	141	54	132	177	21	91	288
Internal Link Dist (ft)		693			446			553			1860
Turn Bay Length (ft)	125		200	175		150	225		125	250	
Base Capacity (vph)	399	851	839	383	1617	834	372	1036	724	464	892
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.27	0.17	0.36	0.23	0.26	0.37	0.28	0.12	0.42	0.46

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	67	128	297	293	306	167	340	1717	157	76	1319	50
Future Volume (vph)	67	128	297	293	306	167	340	1717	157	76	1319	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5		4.5	5.0		4.5	5.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.95		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1804	1827	1590	1719	3317		1787	3314		1736	3331	
Flt Permitted	0.22	1.00	1.00	0.45	1.00		0.06	1.00		0.06	1.00	
Satd. Flow (perm)	417	1827	1590	807	3317		112	3314		117	3331	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	72	138	319	315	329	180	366	1846	169	82	1418	54
RTOR Reduction (vph)	0	0	31	0	54	0	0	4	0	0	2	0
Lane Group Flow (vph)	72	138	288	315	455	0	366	2011	0	82	1470	0
Confl. Peds. (#/hr)	7					7			2	2		
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	0%	4%	1%	5%	2%	3%	1%	7%	12%	4%	8%	2%
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)	26.8	21.7	46.3	33.6	25.1		91.5	74.9		74.5	62.4	
Effective Green, g (s)	26.8	21.7	46.3	33.6	25.1		91.5	74.9		74.5	62.4	
Actuated g/C Ratio	0.20	0.16	0.34	0.25	0.18		0.67	0.55		0.55	0.46	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	5.0		4.5	5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	134	292	595	256	613		379	1829		208	1531	
v/s Ratio Prot	0.02	0.08	0.09	c0.08	0.14		c0.17	c0.61		0.04	0.44	
v/s Ratio Perm	0.09		0.09	c0.23			0.47			0.18		
v/c Ratio	0.54	0.47	0.48	1.23	0.74		0.97	1.10		0.39	0.96	
Uniform Delay, d1	46.0	51.8	35.3	50.6	52.2		45.7	30.4		27.6	35.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.1	1.2	0.6	133.0	4.8		36.9	53.8		1.2	14.6	
Delay (s)	50.1	53.0	35.9	183.6	57.1		82.6	84.2		28.9	50.1	
Level of Service	D	D	D	F	E		F	F		C	D	
Approach Delay (s)		42.3			105.5			84.0			49.0	
Approach LOS		D			F			F			D	

Intersection Summary			
HCM 2000 Control Delay	72.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.17		
Actuated Cycle Length (s)	135.7	Sum of lost time (s)	18.5
Intersection Capacity Utilization	100.9%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	72	138	319	315	509	366	2015	82	1472
v/c Ratio	0.48	0.49	0.56	1.28	0.76	0.96	1.09	0.39	0.95
Control Delay	49.8	57.7	31.9	190.2	53.2	78.0	80.8	25.1	49.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.8	57.7	31.9	190.2	53.2	78.0	80.8	25.1	49.8
Queue Length 50th (ft)	49	112	183	~326	200	268	~1053	22	645
Queue Length 95th (ft)	91	179	273	#532	264	#516	#1312	78	#902
Internal Link Dist (ft)		446			2921		4483		2738
Turn Bay Length (ft)	175			150		150		175	
Base Capacity (vph)	151	493	565	247	992	382	1844	216	1543
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.28	0.56	1.28	0.51	0.96	1.09	0.38	0.95

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection	
Intersection Delay, s/veh	20.5
Intersection LOS	C

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	170	56	220	235	131	223
Future Vol, veh/h	170	56	220	235	131	223
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	3	9	5	9	4	4
Mvmt Flow	185	61	239	255	142	242
Number of Lanes	1	1	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	2	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	2
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	11.7	27.4	17.3
HCM LOS	B	D	C

Lane	NBLn1	EBLn1	EBLn2	WBLn1
Vol Left, %	37%	0%	0%	48%
Vol Thru, %	0%	100%	0%	52%
Vol Right, %	63%	0%	100%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	354	170	56	455
LT Vol	131	0	0	220
Through Vol	0	170	0	235
RT Vol	223	0	56	0
Lane Flow Rate	385	185	61	495
Geometry Grp	2	7	7	5
Degree of Util (X)	0.608	0.332	0.099	0.793
Departure Headway (Hd)	5.693	6.465	5.855	5.774
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	631	554	609	623
Service Time	3.758	4.236	3.626	3.829
HCM Lane V/C Ratio	0.61	0.334	0.1	0.795
HCM Control Delay	17.3	12.5	9.3	27.4
HCM Lane LOS	C	B	A	D
HCM 95th-tile Q	4.1	1.4	0.3	7.7

Intersection	
Int Delay, s/veh	16.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	418	32	422	313	15	359
Future Vol, veh/h	418	32	422	313	15	359
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	150	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	3	40	2	5	0	3
Mvmt Flow	449	34	454	337	16	386

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	484	0	1711	467
Stage 1	-	-	-	-	467	-
Stage 2	-	-	-	-	1244	-
Critical Hdwy	-	-	4.12	-	6.4	6.23
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.218	-	3.5	3.327
Pot Cap-1 Maneuver	-	-	1079	-	101	594
Stage 1	-	-	-	-	635	-
Stage 2	-	-	-	-	274	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1079	-	59	594
Mov Cap-2 Maneuver	-	-	-	-	59	-
Stage 1	-	-	-	-	635	-
Stage 2	-	-	-	-	159	-

Approach	EB	WB	NB
HCM Control Delay, s	0	6.2	56.9
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	436	-	-	1079	-
HCM Lane V/C Ratio	0.922	-	-	0.421	-
HCM Control Delay (s)	56.9	-	-	10.7	-
HCM Lane LOS	F	-	-	B	-
HCM 95th %tile Q(veh)	10.3	-	-	2.1	-

Intersection	
Intersection Delay, s/veh	45.6
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	11	67	27	129	142	99	57	386	110	41	231	4
Future Vol, veh/h	11	67	27	129	142	99	57	386	110	41	231	4
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles, %	0	0	0	1	1	3	0	1	0	0	2	0
Mvmt Flow	13	76	31	147	161	113	65	439	125	47	263	5
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	13.7	17.9	83.8	18.5
HCM LOS	B	C	F	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%
Vol Thru, %	0%	78%	0%	71%	0%	59%	0%	98%
Vol Right, %	0%	22%	0%	29%	0%	41%	0%	2%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	57	496	11	94	129	241	41	235
LT Vol	57	0	11	0	129	0	41	0
Through Vol	0	386	0	67	0	142	0	231
RT Vol	0	110	0	27	0	99	0	4
Lane Flow Rate	65	564	12	107	147	274	47	267
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.137	1.091	0.03	0.24	0.328	0.554	0.102	0.552
Departure Headway (Hd)	7.621	6.968	9.247	8.518	8.426	7.614	8.253	7.76
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	473	524	390	424	430	477	437	467
Service Time	5.321	4.668	6.947	6.218	6.126	5.314	5.953	5.46
HCM Lane V/C Ratio	0.137	1.076	0.031	0.252	0.342	0.574	0.108	0.572
HCM Control Delay	11.5	92.1	12.2	13.9	15.2	19.4	11.9	19.6
HCM Lane LOS	B	F	B	B	C	C	B	C
HCM 95th-tile Q	0.5	17.8	0.1	0.9	1.4	3.3	0.3	3.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	210	0	505	0	380	162	276	356	0
Future Volume (vph)	0	0	0	210	0	505	0	380	162	276	356	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					5.0	5.0		5.0	5.0	5.0	5.0	
Lane Util. Factor					1.00	1.00		1.00	1.00	1.00	1.00	
Frpb, ped/bikes					1.00	0.98		1.00	1.00	1.00	1.00	
Flpb, ped/bikes					0.99	1.00		1.00	1.00	1.00	1.00	
Frt					1.00	0.85		1.00	0.85	1.00	1.00	
Flt Protected					0.95	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)					1783	1559		1881	1599	1805	1881	
Flt Permitted					0.76	1.00		1.00	1.00	0.28	1.00	
Satd. Flow (perm)					1421	1559		1881	1599	532	1881	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	0	0	219	0	526	0	396	169	288	371	0
RTOR Reduction (vph)	0	0	0	0	0	305	0	0	115	0	0	0
Lane Group Flow (vph)	0	0	0	0	219	221	0	396	54	288	371	0
Confl. Peds. (#/hr)	4		10	10		4	3					3
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	0%	0%	0%	0%	0%	1%	0%	1%	1%	0%	1%	0%
Turn Type				Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)					14.0	14.0		17.3	17.3	30.5	30.5	
Effective Green, g (s)					14.0	14.0		17.3	17.3	30.5	30.5	
Actuated g/C Ratio					0.26	0.26		0.32	0.32	0.56	0.56	
Clearance Time (s)					5.0	5.0		5.0	5.0	5.0	5.0	
Vehicle Extension (s)					2.0	2.0		3.0	3.0	2.0	3.0	
Lane Grp Cap (vph)					365	400		597	507	489	1052	
v/s Ratio Prot								0.21		c0.09	0.20	
v/s Ratio Perm					c0.15	0.14			0.03	c0.24		
v/c Ratio					0.60	0.55		0.66	0.11	0.59	0.35	
Uniform Delay, d1					17.8	17.5		16.1	13.1	7.7	6.6	
Progression Factor					1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2					1.8	0.9		2.8	0.1	1.2	0.2	
Delay (s)					19.6	18.5		18.9	13.2	8.9	6.8	
Level of Service					B	B		B	B	A	A	
Approach Delay (s)		0.0			18.8			17.2			7.7	
Approach LOS		A			B			B			A	

Intersection Summary			
HCM 2000 Control Delay	14.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	54.5	Sum of lost time (s)	15.0
Intersection Capacity Utilization	66.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

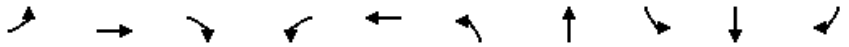
Lane Group	WBT	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	219	526	396	169	288	371
v/c Ratio	0.61	0.75	0.68	0.28	0.59	0.36
Control Delay	27.0	12.6	24.1	4.5	12.9	8.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.0	12.6	24.1	4.5	12.9	8.7
Queue Length 50th (ft)	64	31	111	0	43	58
Queue Length 95th (ft)	138	134	226	36	105	136
Internal Link Dist (ft)	931		2881			465
Turn Bay Length (ft)				100	100	
Base Capacity (vph)	593	891	860	823	513	1112
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.59	0.46	0.21	0.56	0.33

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	273	20	184	14	33	23	368	1922	16	14	1465	321
Future Volume (vph)	273	20	184	14	33	23	368	1922	16	14	1465	321
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0		5.0	6.0		5.0	6.0	5.0
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	0.99		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.94		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.96	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1697	1714	1560	1804	1721		1787	3467		1805	3374	1548
Flt Permitted	0.49	0.49	1.00	0.65	1.00		0.06	1.00		0.06	1.00	1.00
Satd. Flow (perm)	882	877	1560	1239	1721		104	3467		113	3374	1548
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	290	21	196	15	35	24	391	2045	17	15	1559	341
RTOR Reduction (vph)	0	0	61	0	19	0	0	0	0	0	0	101
Lane Group Flow (vph)	154	157	135	15	40	0	391	2062	0	15	1559	240
Confl. Peds. (#/hr)	1		1	1		1	2		1	1		2
Confl. Bikes (#/hr)						2						
Heavy Vehicles (%)	1%	0%	3%	0%	0%	7%	1%	4%	0%	0%	7%	2%
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA		pm+pt	NA	pm+ov
Protected Phases	3	8	1	7	4		1	6		5	2	3
Permitted Phases	8		8	4			6			2		2
Actuated Green, G (s)	25.1	25.1	43.9	13.3	11.0		98.4	90.3		70.4	67.3	76.4
Effective Green, g (s)	25.1	25.1	43.9	13.3	11.0		98.4	90.3		70.4	67.3	76.4
Actuated g/C Ratio	0.19	0.19	0.33	0.10	0.08		0.73	0.67		0.52	0.50	0.57
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	6.0		5.0	6.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	219	220	567	132	140		402	2327		98	1688	879
v/s Ratio Prot	0.05	c0.05	0.05	0.00	0.02		c0.19	0.59		0.00	0.46	0.02
v/s Ratio Perm	0.08	c0.08	0.04	0.01			c0.52			0.08		0.14
v/c Ratio	0.70	0.71	0.24	0.11	0.28		0.97	0.89		0.15	0.92	0.27
Uniform Delay, d1	49.9	51.3	33.1	55.1	58.0		45.6	17.9		21.1	31.2	14.9
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	9.8	10.4	0.2	0.4	1.1		37.5	4.5		0.7	8.9	0.2
Delay (s)	59.7	61.8	33.3	55.4	59.2		83.0	22.4		21.9	40.1	15.0
Level of Service	E	E	C	E	E		F	C		C	D	B
Approach Delay (s)		50.1			58.4			32.1			35.5	
Approach LOS		D			E			C			D	

Intersection Summary			
HCM 2000 Control Delay	35.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	134.5	Sum of lost time (s)	21.0
Intersection Capacity Utilization	89.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	154	157	196	15	59	391	2062	15	1559	341
v/c Ratio	0.77	0.78	0.33	0.09	0.38	0.93	0.85	0.09	0.92	0.34
Control Delay	73.8	75.1	16.9	44.1	45.2	69.5	20.9	9.1	40.9	5.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	73.8	75.1	16.9	44.1	45.2	69.5	20.9	9.1	40.9	5.2
Queue Length 50th (ft)	124	126	54	11	30	269	497	3	612	35
Queue Length 95th (ft)	#198	#206	126	31	75	#520	#1139	11	#895	97
Internal Link Dist (ft)		931			261		4040		4483	
Turn Bay Length (ft)	150		125	150		100		150		275
Base Capacity (vph)	201	306	592	171	433	419	2440	169	1687	993
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.77	0.51	0.33	0.09	0.14	0.93	0.85	0.09	0.92	0.34

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection	
Int Delay, s/veh	3.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔		↰	↱	
Traffic Vol, veh/h	5	20	2	44	15	57	8	333	92	68	181	11
Future Vol, veh/h	5	20	2	44	15	57	8	333	92	68	181	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	-	-	-	-	-	-	-	-	-	250	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	5	0
Mvmt Flow	5	21	2	45	15	59	8	343	95	70	187	11

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	776	787	192	751	745	391	198	0	0	438	0	0
Stage 1	332	332	-	407	407	-	-	-	-	-	-	-
Stage 2	444	455	-	344	338	-	-	-	-	-	-	-
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	317	326	855	330	345	662	1387	-	-	1133	-	-
Stage 1	686	648	-	625	601	-	-	-	-	-	-	-
Stage 2	597	572	-	676	644	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	264	303	855	296	321	662	1387	-	-	1133	-	-
Mov Cap-2 Maneuver	264	303	-	296	321	-	-	-	-	-	-	-
Stage 1	681	608	-	620	596	-	-	-	-	-	-	-
Stage 2	526	567	-	611	604	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17.8	17.3	0.1	2.2
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1387	-	-	309	412	1133	-	-
HCM Lane V/C Ratio	0.006	-	-	0.09	0.29	0.062	-	-
HCM Control Delay (s)	7.6	0	-	17.8	17.3	8.4	-	-
HCM Lane LOS	A	A	-	C	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.3	1.2	0.2	-	-

Intersection	
Intersection Delay, s/veh	40.2
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	29	92	48	8	137	8	169	529	11	4	245	32
Future Vol, veh/h	29	92	48	8	137	8	169	529	11	4	245	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, %	3	1	0	0	0	0	2	1	0	0	1	3
Mvmt Flow	32	100	52	9	149	9	184	575	12	4	266	35
Number of Lanes	0	1	0	0	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay	14.2	14	60.6	18.7
HCM LOS	B	B	F	C

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	17%	5%	100%	0%
Vol Thru, %	0%	98%	54%	90%	0%	88%
Vol Right, %	0%	2%	28%	5%	0%	12%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	169	540	169	153	4	277
LT Vol	169	0	29	8	4	0
Through Vol	0	529	92	137	0	245
RT Vol	0	11	48	8	0	32
Lane Flow Rate	184	587	184	166	4	301
Geometry Grp	7	7	2	2	7	7
Degree of Util (X)	0.355	1.046	0.36	0.332	0.009	0.575
Departure Headway (Hd)	6.956	6.413	7.233	7.358	7.625	7.047
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	520	569	500	492	472	515
Service Time	4.656	4.113	5.233	5.358	5.325	4.747
HCM Lane V/C Ratio	0.354	1.032	0.368	0.337	0.008	0.584
HCM Control Delay	13.4	75.4	14.2	14	10.4	18.8
HCM Lane LOS	B	F	B	B	B	C
HCM 95th-tile Q	1.6	16.5	1.6	1.4	0	3.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	265	204	326	754	0	0	0	0	122	0	192
Future Volume (vph)	0	265	204	326	754	0	0	0	0	122	0	192
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0	5.0	5.0						5.0	5.0
Lane Util. Factor		1.00	1.00	1.00	1.00						1.00	1.00
Frpb, ped/bikes		1.00	0.98	1.00	1.00						1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		1810	1545	1701	1881						1805	1583
Flt Permitted		1.00	1.00	0.43	1.00						0.95	1.00
Satd. Flow (perm)		1810	1545	779	1881						1805	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	288	222	354	820	0	0	0	0	133	0	209
RTOR Reduction (vph)	0	0	137	0	0	0	0	0	0	0	0	85
Lane Group Flow (vph)	0	288	85	354	820	0	0	0	0	0	133	124
Confl. Peds. (#/hr)			4	4								
Heavy Vehicles (%)	0%	5%	2%	6%	1%	0%	0%	0%	0%	0%	0%	2%
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	Perm
Protected Phases		2		1	6						4	
Permitted Phases			2	6						4		4
Actuated Green, G (s)		18.1	18.1	29.3	29.3						9.7	9.7
Effective Green, g (s)		18.1	18.1	29.3	29.3						9.7	9.7
Actuated g/C Ratio		0.37	0.37	0.60	0.60						0.20	0.20
Clearance Time (s)		5.0	5.0	5.0	5.0						5.0	5.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0						3.0	3.0
Lane Grp Cap (vph)		668	570	582	1124						357	313
v/s Ratio Prot		0.16		0.08	c0.44							
v/s Ratio Perm			0.05	0.29							0.07	c0.08
v/c Ratio		0.43	0.15	0.61	0.73						0.37	0.40
Uniform Delay, d1		11.6	10.3	5.5	7.0						17.0	17.1
Progression Factor		1.00	1.00	1.00	1.00						1.00	1.00
Incremental Delay, d2		0.4	0.1	1.8	2.4						0.7	0.8
Delay (s)		12.0	10.4	7.3	9.4						17.7	17.9
Level of Service		B	B	A	A						B	B
Approach Delay (s)		11.3			8.8			0.0			17.8	
Approach LOS		B			A			A			B	

Intersection Summary			
HCM 2000 Control Delay	11.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	49.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	77.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	EBR	WBL	WBT	SBT	SBR
Lane Group Flow (vph)	288	222	354	820	133	209
v/c Ratio	0.44	0.32	0.61	0.73	0.37	0.53
Control Delay	14.3	3.6	11.3	12.7	21.7	15.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.3	3.6	11.3	12.7	21.7	15.5
Queue Length 50th (ft)	58	1	41	134	34	26
Queue Length 95th (ft)	128	36	104	330	79	81
Internal Link Dist (ft)	1380			488	462	
Turn Bay Length (ft)		75	150			200
Base Capacity (vph)	906	880	577	1373	1129	1030
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.25	0.61	0.60	0.12	0.20

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	116	273	0	0	705	202	379	1	239	0	0	0
Future Volume (vph)	116	273	0	0	705	202	379	1	239	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0	5.0	5.0	5.0				
Lane Util. Factor	1.00	1.00			1.00	1.00	1.00	1.00				
Frpb, ped/bikes	1.00	1.00			1.00	0.98	1.00	1.00				
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00				
Frt	1.00	1.00			1.00	0.85	1.00	0.85				
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00				
Satd. Flow (prot)	1736	1810			1827	1515	1770	1554				
Flt Permitted	0.12	1.00			1.00	1.00	0.95	1.00				
Satd. Flow (perm)	220	1810			1827	1515	1770	1554				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	126	297	0	0	766	220	412	1	260	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	58	0	176	0	0	0	0
Lane Group Flow (vph)	126	297	0	0	766	162	412	85	0	0	0	0
Confl. Peds. (#/hr)	3		1	1		3						
Heavy Vehicles (%)	4%	5%	0%	0%	4%	4%	2%	0%	4%	0%	0%	0%
Turn Type	pm+pt	NA			NA	Perm	Perm	NA				
Protected Phases	5	2			6			8				
Permitted Phases	2					6	8					
Actuated Green, G (s)	36.6	36.6			28.2	28.2	22.3	22.3				
Effective Green, g (s)	36.6	36.6			28.2	28.2	22.3	22.3				
Actuated g/C Ratio	0.53	0.53			0.41	0.41	0.32	0.32				
Clearance Time (s)	5.0	5.0			5.0	5.0	5.0	5.0				
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0				
Lane Grp Cap (vph)	191	961			747	620	572	502				
v/s Ratio Prot	c0.03	0.16			c0.42			0.05				
v/s Ratio Perm	0.32					0.11	c0.23					
v/c Ratio	0.66	0.31			1.03	0.26	0.72	0.17				
Uniform Delay, d1	14.8	9.1			20.4	13.5	20.5	16.7				
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00				
Incremental Delay, d2	8.0	0.2			39.6	0.2	4.4	0.2				
Delay (s)	22.8	9.2			59.9	13.7	25.0	16.8				
Level of Service	C	A			E	B	C	B				
Approach Delay (s)		13.3			49.6			21.8			0.0	
Approach LOS		B			D			C			A	

Intersection Summary			
HCM 2000 Control Delay	33.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	68.9	Sum of lost time (s)	15.0
Intersection Capacity Utilization	77.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT
Lane Group Flow (vph)	126	297	766	220	412	261
v/c Ratio	0.58	0.31	1.01	0.32	0.71	0.38
Control Delay	24.4	11.9	61.3	11.2	27.4	4.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.4	11.9	61.3	11.2	27.4	4.1
Queue Length 50th (ft)	25	66	~368	33	153	0
Queue Length 95th (ft)	#88	149	#687	99	241	42
Internal Link Dist (ft)		488	979			520
Turn Bay Length (ft)	150			100		
Base Capacity (vph)	216	1011	758	685	881	905
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.29	1.01	0.32	0.47	0.29

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection	
Int Delay, s/veh	30

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	394	113	9	485	246	19
Future Vol, veh/h	394	113	9	485	246	19
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	75	-	150	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	3	16	0	5	0	8
Mvmt Flow	448	128	10	551	280	22

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	576	0	1084	512
Stage 1	-	-	-	-	512	-
Stage 2	-	-	-	-	572	-
Critical Hdwy	-	-	4.1	-	6.4	6.28
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.372
Pot Cap-1 Maneuver	-	-	1007	-	~ 242	550
Stage 1	-	-	-	-	606	-
Stage 2	-	-	-	-	569	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1007	-	~ 240	550
Mov Cap-2 Maneuver	-	-	-	-	~ 240	-
Stage 1	-	-	-	-	606	-
Stage 2	-	-	-	-	563	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	143.1
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	240	550	-	-	1007	-
HCM Lane V/C Ratio	1.165	0.039	-	-	0.01	-
HCM Control Delay (s)	153.2	11.8	-	-	8.6	-
HCM Lane LOS	F	B	-	-	A	-
HCM 95th %tile Q(veh)	13	0.1	-	-	0	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	9	199	417	413	238	4
Future Vol, veh/h	9	199	417	413	238	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	4	1	0	1	0
Mvmt Flow	10	221	463	459	264	4

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1653	267	269	0	-	0
Stage 1	267	-	-	-	-	-
Stage 2	1386	-	-	-	-	-
Critical Hdwy	6.4	6.24	4.11	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.336	2.209	-	-	-
Pot Cap-1 Maneuver	109	767	1300	-	-	-
Stage 1	782	-	-	-	-	-
Stage 2	234	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	57	767	1300	-	-	-
Mov Cap-2 Maneuver	57	-	-	-	-	-
Stage 1	782	-	-	-	-	-
Stage 2	122	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	18.3	4.7	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1300	-	498	-	-
HCM Lane V/C Ratio	0.356	-	0.464	-	-
HCM Control Delay (s)	9.3	0	18.3	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	1.6	-	2.4	-	-