

APPENDIX

- A. Analysis of Streets, Roads and Intersections
- B. Analysis of Non-motorized Network
- C. Capitol Boulevard Plan – Transportation Summary
- D. Brewery District Plan – Transportation Summary

A. ANALYSIS OF ROADS, AND INTERSECTIONS

This Document has been published separately

Appendix A

Analysis of Roads and Intersections

Project Reference:

SCJ #625.17

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Transportation Master Plan\Traffic\Report\2016 0607 Appendix A.docx



SCJ ALLIANCE
CONSULTING SERVICES

1. EXISTING ROADWAY CONDITIONS

1.1 TRAFFIC VOLUME COUNTS AND INTERSECTION LANE GEOMETRY

A comprehensive traffic volume count program was conducted to identify base year traffic volumes within the study area. Sixty-nine intersection counts were collected, primarily by Traffic Count Consultants, a traffic data collection firm. Most of the counts were conducted between 4:00 PM and 6:00 PM on June 23, 24, 25 and 30, 2015 and July 1, 2015. The traffic volumes were summarized to identify the highest individual hour within the two-hour count period. These traffic volumes were used for our base year operations analysis and as the basis for future year traffic volume projections. The turning movement count worksheets are provided in **Appendix A-1**. The existing 2015 PM peak hour intersection turning movement volumes are shown on **Figure 1**.

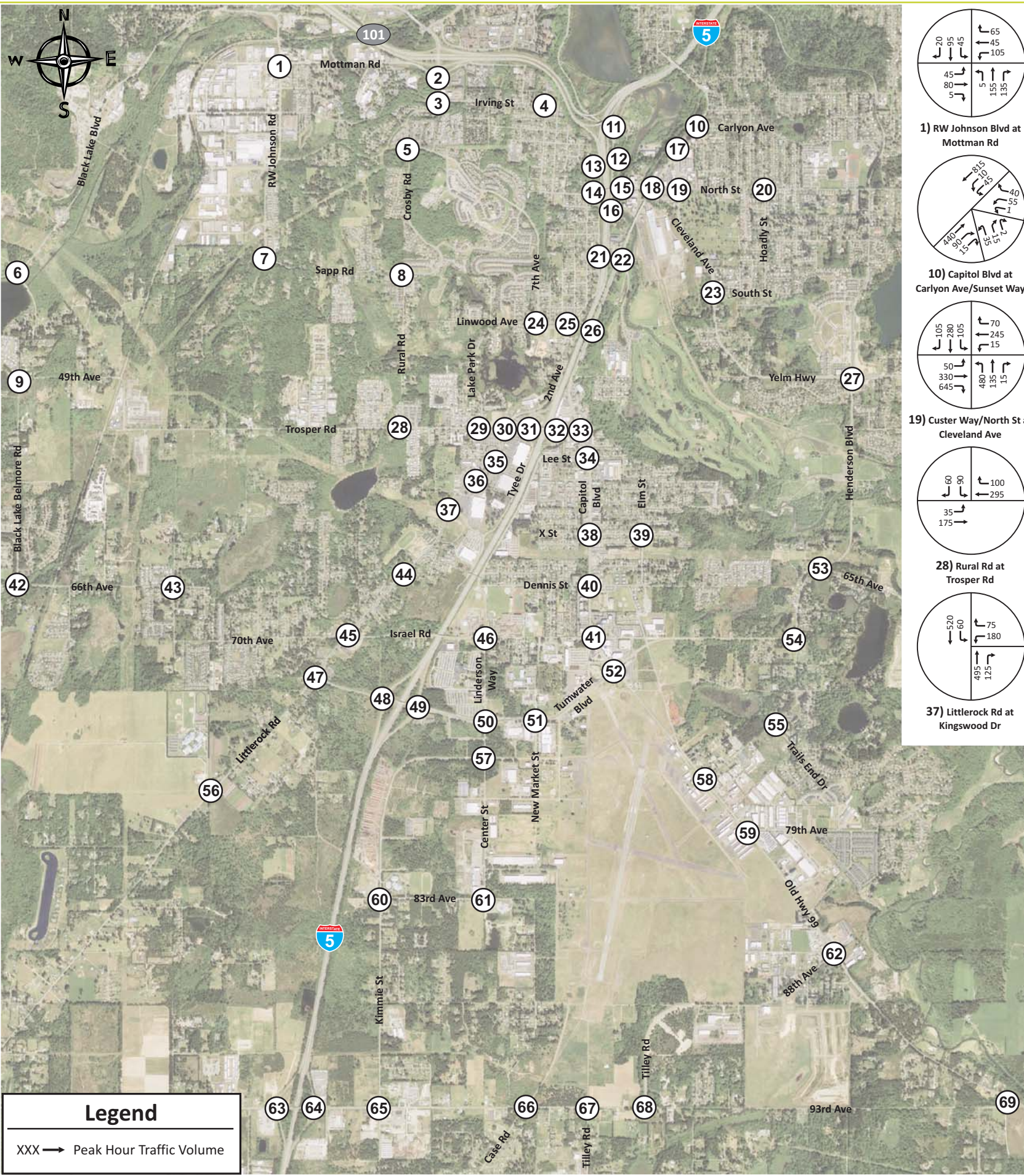
The existing intersection lane geometry and control types are provided on **Figure 2**.

1.2 CRASH HISTORY

A crash history analysis was performed for the study intersections. Washington State Department of Transportation provided collision data for all of the study intersections, including those in the UGA and WSDOT right-of-way. The data includes all reported vehicle crashes occurring over the most current complete five-year span of January 1, 2010 through December 31, 2014. A crash frequency rate per Millions of Entering Vehicles (MEV) was calculated for the study intersections based on the following formula:

$$\text{Crash Rate per MEV} = \frac{1,000,000 \times \text{Total Collisions}}{365 \times \text{Number of Years} \times \text{Average Daily Entering Traffic}}$$

The crash rates by intersection are summarized in **Table 1**.



Tumwater Transportation Master Plan
Tumwater, Washington

Figure 1
Existing 2015 PM Peak Hour
Intersection Traffic Volumes

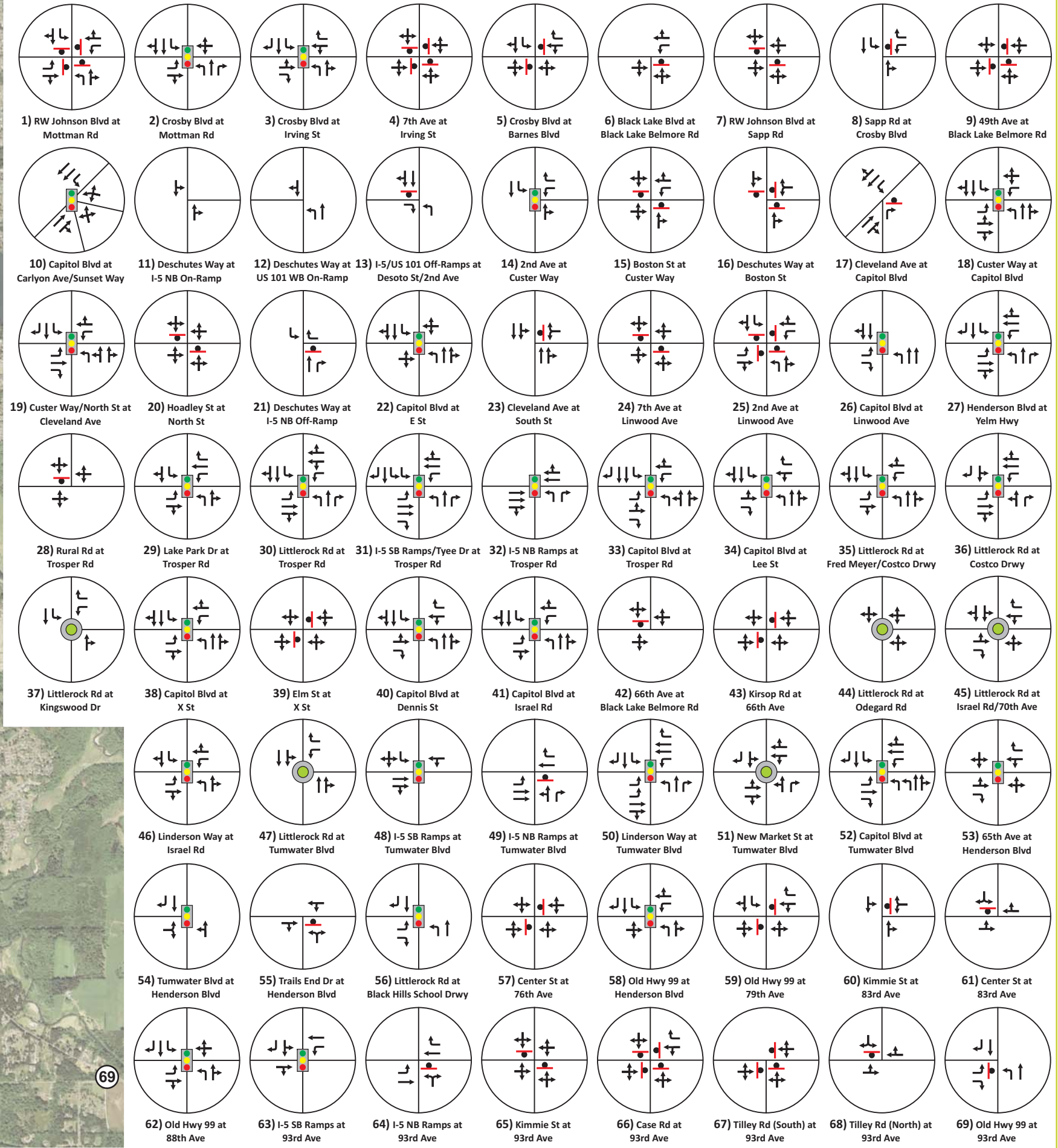
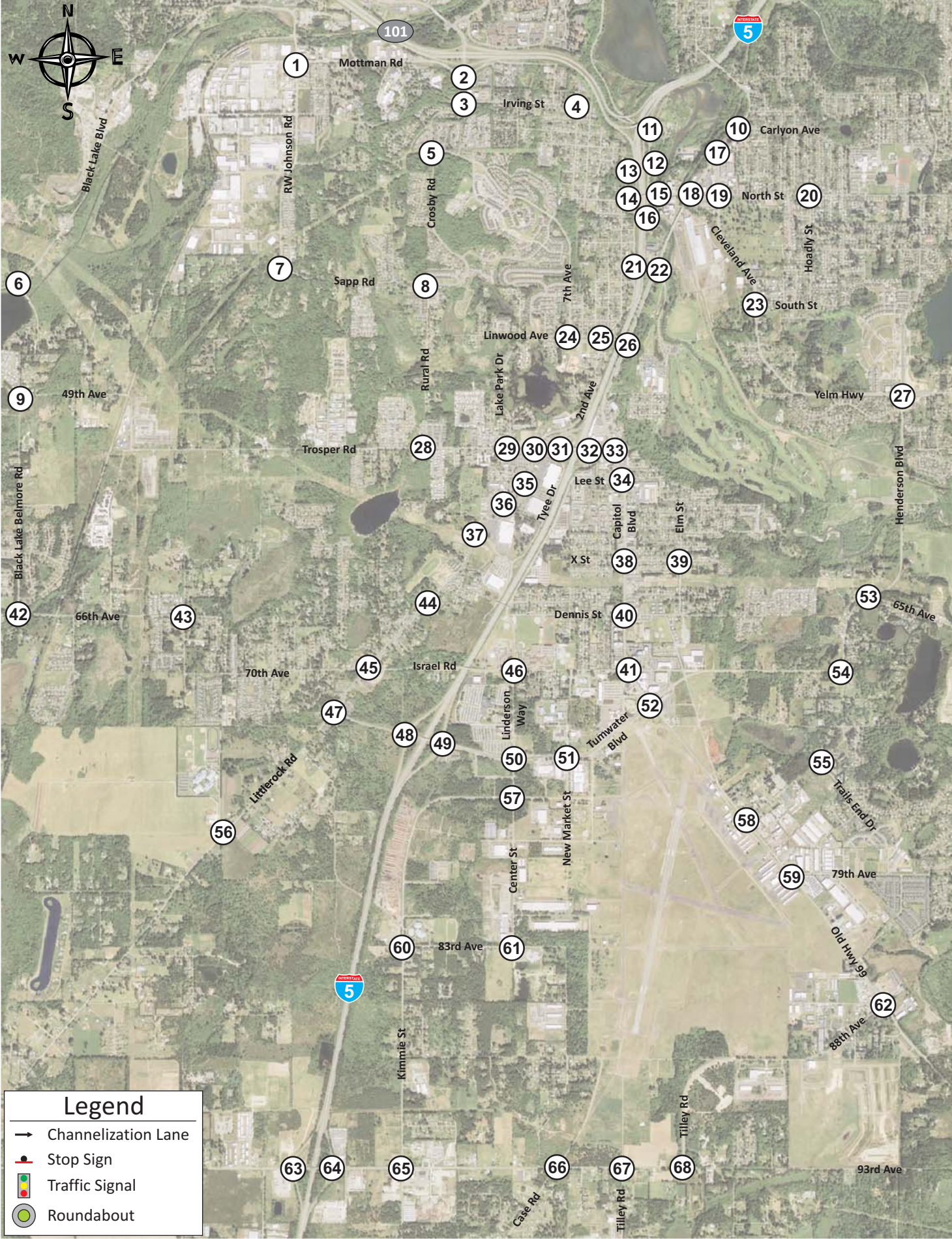


Table 1. Intersection Crash History 2010 through 2014

	Intersection	Total Number of Reported Crashes	Number Involving Injuries	Number Involving Bikes or Peds	Total Daily Entering Traffic Volume	Crash Rate per MEV
1	RW Johnson Blvd/Mottman Rd	8	3	0	7,950	0.551
2	Crosby Blvd/Mottman Rd	29	8	0	22,860	0.695
3	Crosby Blvd/Irving St	19	4	0	13,470	0.773
4	7 th Ave/Irving St	0	0	0	3,880	0.000
5	Crosby Blvd/Barnes Blvd	1	0	0	6,670	0.082
6	Black Lake Blvd/Black Lake Belmore Rd	2	0	0	9,550	0.115
7	RW Johnson Blvd/Sapp Rd	1	0	0	2,700	0.203
8	Sapp Rd/Crosby Blvd	1	0	0	4,040	0.136
9	49 th Ave/Black Lake Belmore Rd	2	1	0	6,050	0.181
10	Capitol Blvd/Carlyon Ave/Sunset Way	1	0	0	15,540	0.035
11	Deschutes Way/I-5 NB On-Ramp	0	0	0	8,310	0.000
12	Deschutes Way/US 101 WB On-Ramp	1	0	0	10,920	0.050
13	I-5/US 101 Off-Ramps/Desoto St/2 nd Ave	18	5	0	11,700	0.843
14	2 nd Ave/Custer Way	4	1	0	14,900	0.147
15	Boston St/Custer Way	5	3	1	16,640	0.165
16	Deschutes Way/Boston St	7	3	0	12,200	0.314
17	Cleveland Ave/Capitol Blvd	4	2	0	14,880	0.147
18	Custer Way/Capitol Blvd	18	4	1	29,760	0.331
19	Custer Way/North St/Cleveland Ave	19	7	1	24,740	0.421
20	Hoadly St/North St	2	1	0	8,250	0.133
21	Deschutes Way/I-5 NB Off-Ramp	0	0	0	8,210	0.000
22	Capitol Blvd/E St	11	6	1	24,120	0.250
23	Cleveland Ave/South St	2	2	0	14,720	0.074
24	7 th Ave/Linwood Ave	3	2	0	7,890	0.208
25	2 nd Ave/Linwood Ave	11	3	0	13,670	0.441
26	Capitol Blvd/Linwood Ave	8	3	0	20,390	0.215
27	Henderson Blvd/Yelm Hwy	37	14	1	31,600	0.642
28	Rural Rd/Trosper Rd	4	1	0	7,540	0.291
29	Lake Park Dr/Trosper Rd	4	3	1	9,930	0.221
30	Littlerock Rd/Trosper Rd	32	6	0	22,890	0.766
31	I-5 SB Ramps/Tyee Dr/Trosper Rd	65	16	1	31,540	1.129
32	I-5 NB Ramps/Trosper Rd	28	8	0	27,960	0.549
33	Capitol Blvd/Trosper Rd	35	8	0	32,230	0.595
34	Capitol Blvd/Lee St	42	9	3	24,930	0.923
35	Littlerock Rd/Fred Meyer-Costco Drwy	2	1	1	16,800	0.065
36	Littlerock Rd/Costco Drwy	3	1	1	17,740	0.093
37	Littlerock Rd/Kingswood Dr	15	7	1	14,520	0.566
38	Capitol Blvd/X St	4	3	0	17,900	0.122
39	Elm St/X St	1	0	0	1,600	0.342
40	Capitol Blvd/Dennis St	9	4	0	17,630	0.280

Table 1 Cont. Intersection Crash History 2010 through 2014

		Total Number of Reported Crashes	Number Involving Injuries	Number Involving Bikes or Peds	Total Daily Entering Traffic Volume	Crash Rate per MEV
41	Capitol Blvd/Israel Rd	20	7	2	18,750	0.584
42	66 th Ave/Black Lake Belmore Rd	5	2	0	4,470	0.613
43	Kirsop Rd/66 th Ave	4	3	0	4,120	0.532
44	Littlerock Rd/Odegard Rd	5	1	1	13,200	0.208
45	Littlerock Rd/Israel Rd/70 th Ave	12	1	0	18,910	0.348
46	Linderson Way/Israel Rd	7	2	0	11,300	0.339
47	Littlerock Rd/Tumwater Blvd	19	3	0	13,300	0.783
48	I-5 SB Ramps/Tumwater Blvd	15	2	0	16,780	0.490
49	I-5 NB Ramps/Tumwater Blvd	14	4	0	26,910	0.285
50	Linderson Way/Tumwater Blvd	15	6	0	31,510	0.261
51	New Market St/Tumwater Blvd	8	2	0	17,690	0.248
52	Capitol Blvd/Tumwater Blvd	27	8	0	22,500	0.658
53	65 th Ave/Henderson Blvd	2	1	0	15,630	0.070
54	Tumwater Blvd/Henderson Blvd	5	2	0	13,700	0.200
55	Trails End Dr/Henderson Blvd	1	1	0	5,810	0.094
56	Littlerock Rd/Black Hills School Drwy	1	0	0	6,160	0.089
57	Center St/76 th Ave	0	0	0	7,030	0.000
58	Old Hwy 99/Henderson Blvd	15	8	0	17,820	0.461
59	Old Hwy 99/79 th Ave	4	1	0	15,540	0.141
60	Kimmie St/83 rd Ave	0	0	0	1,700	0.000
61	Center St/83 rd Ave	2	1	0	4,230	0.259
62	Old Hwy 99/88 th Ave	3	0	0	13,370	0.123
63	I-5 SB Ramps/93 rd Ave	22	5	0	13,770	0.875
64	I-5 NB Ramps/93 rd Ave	5	2	0	15,000	0.183
65	Kimmie St/93 rd Ave	5	5	0	10,020	0.273
66	Case Rd/93 rd Ave	0	0	0	10,950	0.000
67	Tilley Rd (South)/93 rd Ave	9	1	0	9,140	0.540
68	Tilley Rd (North)/93 rd Ave	4	3	0	6,500	0.337
69	Old Hwy 99/93 rd Ave	4	3	0	11,120	0.197

*“Under 23U.S. Code §148 and 23 U.S. § 409, Safety Data, reports, surveys, schedules, lists compiled or collected for the purposes of identifying, evaluating, or planning the safety enhancement of potential crash sites, hazardous roadway conditions, or railway-highway crossings are not subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data”

A crash rate under 1.00 per MEV is typically considered within normal range for an urban intersection. In the study area one intersection exceeded the 1.00 crash rate and three others were over 0.80. Those locations are discussed below.

1.2.1 I-5/US 101 Off-Ramps/Desoto St/2nd Ave

This intersection had 18 reported crashes over the 5-year period, a crash rate of 0.843 with an average of 3.6 per crashes per year. The primary collision type was rear-end collision for vehicles on the off-

ramp. This could likely be a result of occasional congestion and queuing on the off-ramp, compounded by vehicles weaving to get into the inside lane to eventually make a left-turn onto Custer Way. The next most common type involved collisions between a vehicle turning left and vehicle going straight. This could reflect occasional driver confusion over the unusual intersection configuration.

There is a planned improvement to allow for two left-turn lanes on 2nd Avenue for vehicles turning onto Custer Way. This is intended to improve the lane utilization on the off-ramp and reduce weaving conflicts as both off-ramp lanes could be used to get into the double left-turn lanes at Custer Way. This intersection should continue to be monitored.

1.2.2 I-5 SB Ramps/Tyee Dr/Trosper Rd

This intersection experienced 65 crashes and a rate of 1.129 crashes per MEV over the five-year study period. Over half of the collisions at this intersection are rear-end collisions, with the primary circumstance being vehicles traveling eastbound on Trosper Rd. This is likely the result of congestion between the SB Ramps/Tyee Drive intersection and the 2nd Ave/Littlerock Rd intersection. The next primary circumstance for rear-end collisions occurs in the NB right-turn lane, likely the result of vehicles unable to make right-turn-on-red maneuvers.

There is a planned improvement to install a two-lane roundabout at this location. It will be built in conjunction with a roundabout at Trosper Rd/2nd Ave/Littlerock Rd, and together they should reduce the congestion experienced today along Trosper Road, which should reduce the number of rear-end collisions.

1.2.3 Capitol Blvd/Lee St

This intersection had 42 reported collisions between 2010 and 2014, equating to a crash rate of 0.923 crashes per MEV. The primary collision type for this intersection was rear-end collisions for vehicles traveling NB on Capitol Blvd. This is likely a result of the congestion and resultant queues created by the Trosper Rd/Capitol Blvd intersection.

There is no improvement specifically planned for this location, however the Trosper Road Interchange project is being constructed to relieve the congestion currently caused by the Trosper Rd/Capitol Blvd intersection. The completion of this improvement should improve congestion along Capitol Blvd and reduce the number of rear-end collisions at this location.

1.2.4 I-5 SB Ramps/93rd Avenue (SR 121)

This intersection experienced 22 crashes over a five year period, resulting in a crash rate of 0.875 crashes per MEV. There was not a predominant collision type at this intersection, but the majority of crashes occurred by vehicles traveling SB on the I-5 SB ramp. 21 of the 22 recorded crashes occurred in 2010 and 2011. After 2011 a traffic signal was installed at this intersection to improve traffic operations for the SB approach. This improvement has seen the crash rate drop to almost zero, with only 1 crash occurring between 2012-2014.

The intersection crash data is provided in **Appendix A-2**.

2. TRAFFIC VOLUME FORECASTS

2.1 OVERVIEW

This report provides operational assessment of the City roadway network for the existing year (2015) for the forecast years of 2022 and 2040. The traffic volume forecasts were prepared using the TRPC regional travel demand model as the basis. The regional model has been calibrated to a 2014 base year and has a 2040 forecast horizon.

2.2 TRAVEL DEMAND MODELING PROCESS

A travel demand model is a computer model that uses mathematical representations of transportation facilities and transportation demand to estimate travel patterns in a specific geographic area. Travel demand modeling typically uses the four-step modeling process described below:

- Trip Generation – is the process of estimating the amount of person-trips that will be generated within the modeled area. Households and employment are the primary drivers of trip generation.
- Trip Distribution – evaluates the attractiveness of compatible land-uses to connect two ends of the same trip, e.g., a work-to-home trip is common during the evening peak hour with an employment base producing an outbound trip and a household attracting an inbound trip.
- Mode Choice – reflects the process of estimating the traveling public's selection of a travel mode such as passenger vehicle (SOV or HOV), heavy vehicle, walk, bike or transit. The availability (supply) of a particular mode affects the demand of that mode, for example, close proximity to a transit stop with good headways makes the transit option more attractive and can influence a traveler's mode choice.
- Assignment – is the final step of determining each traveler's route from their origin to their destination. There are almost always multiple options for a route between two points. The primary consideration in route choice is travel time, which can be affected by roadway speed limits, traffic signals, congestion and other frictions.

2.3 TRPC TRAVEL DEMAND MODEL

The TRPC regional travel demand model was built using INRO's Emme software. The model provides a detailed representation of the arterial and collector roadways throughout Thurston County. Particular detail has been provided in the urban areas of the county, including Tumwater and environs. The model uses household and employment information as a basis for estimating the trip-producing characteristics of neighborhoods, employment centers, retail districts, schools, etc. within the cities and unincorporated county. Measured local travel parameters were incorporated to calibrate the model to local conditions. When model-produced traffic characteristics closely match measured traffic characteristics the model is considered calibrated.

A calibrated model can be used to test the effects of changes of one or many variables on the system. Adding a new roadway provides different route choices which can affect traffic flows, adding transit service or enhanced walk and bike facilities can affect mode choice. Changes to the amount or type of land-use will also affect the volume and characteristics of travel in an area.

The TRPC model has been updated and calibrated to a 2014 base year. The model update was completed with oversight from a regional Transportation Advisory Committee (TAC) that included representation from the City of Tumwater and multiple other affected jurisdictions in the Thurston County. The regional model has a planning horizon year of 2040. The 2040 model reflects predicted changes to household and employment throughout the region consistent with regional forecasting and Tumwater land-use planning.

The 2040 forecast model also includes transportation improvements consistent with the Regional Transportation Plan. The specific improvements that are assumed to be completed in the “base” 2040 network within the City of Tumwater UGA are listed below.

2040 “Base” Model Planned Network Improvements

- Tyee Drive Extension – New street connection from Kingswood Drive to Prine Drive
- E Street Extension – New multi-lane roadway from Capitol Boulevard to Cleveland Avenue
- Old Highway 99 Improvements – Widen existing roadway from 73rd Avenue to 88th Avenue
- Tumwater Boulevard Interchange – Widen over-crossing and improve ramps at existing Tumwater Boulevard/Interstate 5 interchange
- Capitol Boulevard Improvements – Intersection and capacity improvements on Capitol Boulevard between Trosper Road and Israel Road, construction of new 6th Avenue collector, relocation of I-5 NB off-ramp terminal at Trosper Road to 6th Avenue
- Brewery District Plan – Incorporate lane reductions and intersection improvements per the Brewery District Plan

While additional improvements were evaluated, no additional roadway projects were added to the 2040 “base” model for traffic volume forecasting purposes.

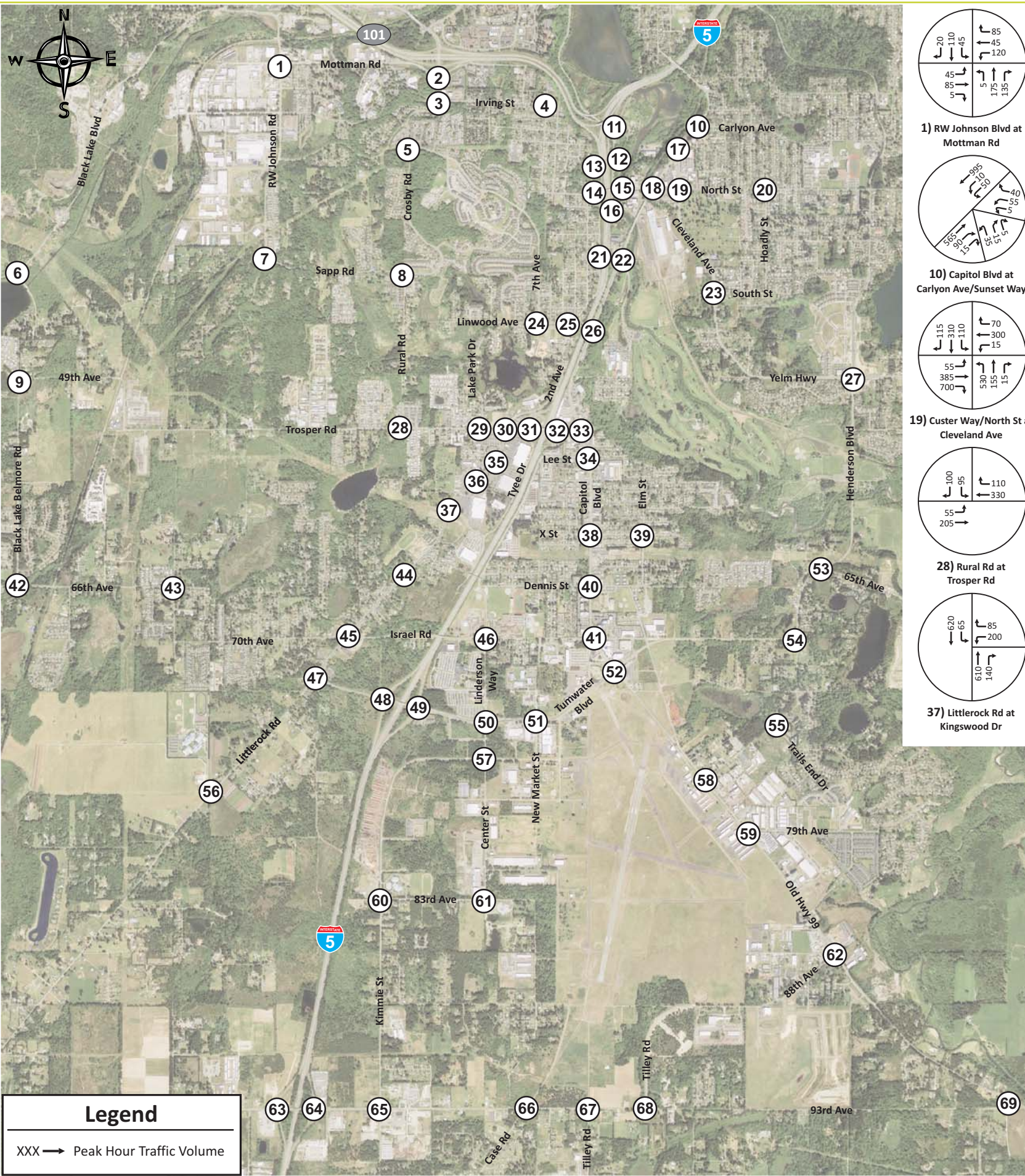
Model plots showing the Traffic Analysis Zone structure, roadway network and “raw” model traffic volumes are included in **Appendix A-3**.

2.4 MODEL VOLUME POST-PROCESSING

While the model is calibrated to replicate existing travel patterns, traffic volumes on individual roadways vary somewhat from existing traffic counts. To account for this variance, the transportation model traffic volume assignments were post-processed to align them with existing ground counts. Specifically, the traffic volume growth increment between the 2014 base year model and 2040 forecast model was calculated for each individual study intersection. The traffic growth predicted by the model was then added to the actual counted traffic volumes at each intersection. All traffic volume forecasts were individually reviewed and manually adjusted as appropriate.

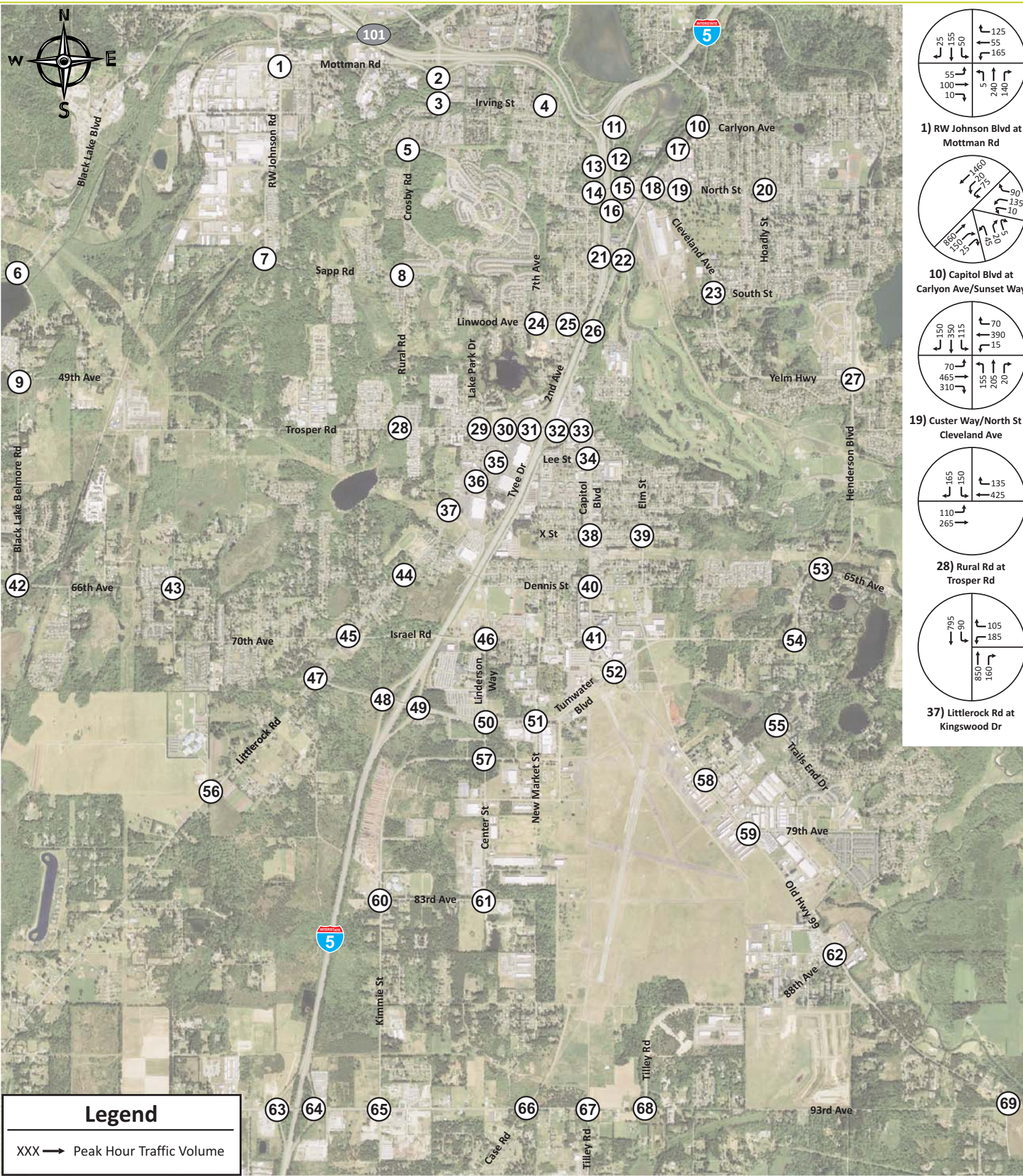
For the 2022 horizon the model growth was calculated between the 2014 and 2040 models and 7 years of that growth was added to the 2015 actual counts. The 2040 model was run assuming none of the RTP projects in place by the 2022 horizon.

The 2022 and 2040 traffic volume forecasts are provided on **Figure 3** and **Figure 4**. The traffic volume calculation spreadsheet showing the 2022 and 2040 forecasts attached in **Appendix A-4**.



Tumwater Transportation Master Plan
Tumwater, Washington

Figure 3
Projected 2022 PM Peak Hour
Intersection Traffic Volumes



Tumwater Transportation Master Plan
Tumwater, Washington

Figure 4
Projected 2040 PM Peak Hour
Intersection Traffic Volumes

3. ROADWAY AND INTERSECTION OPERATIONS SUMMARY

3.1 ANALYSIS METHODOLOGIES

The acknowledged source for determining overall capacity for intersections is the current edition of the Highway Capacity Manual (HCM). Intersection analysis was performed using version 9 of the Synchro/SimTraffic software package. This software implements the methods of the 2010 HCM. Capacity analysis calculations for intersections determine the amount of “control delay” (in seconds) that drivers will experience while proceeding through an intersection. Control delay includes all deceleration delay, stopped delay and acceleration delay caused by the traffic control device. The LOS is directly related to the amount of delay experienced. Capacity analysis results are described in terms of level of service (LOS). LOS is a qualitative term describing operating conditions a driver will experience while traveling on a particular street or highway during a specific time interval. It ranges from A (very little delay) to F (long delays and congestion).

For intersections under traffic signal, modern roundabout and all-way stop-control (AWSC) the intersection average delay is considered to represent the intersection LOS. For intersections under two-way stop-control (TWSC), the LOS/delay criteria are different than for signalized intersections because driver expectation is that a signalized intersection is designed to carry higher traffic volumes and experience greater delay. **Table 2** shows the level of service criteria for signalized, modern roundabout and stop sign-controlled intersections.

A planning level evaluation of roadway segments was prepared for most collector and arterial roadway segments within the study area. The analysis was based on the volume to capacity ratio (v/c). This ratio compares the measured or forecasted traffic volume on a roadway segment to the theoretical vehicle carrying capacity of the roadway segment. A roadway segment with a v/c of 1.0 or greater is determined to have higher traffic demand than it can functionally handle. In this analysis the roadway capacities used were taken from the TRPC Regional demand model. The roadway segment LOS standards are also shown on **Table 2**.

Table 2. Level of Service/Delay Criteria for Intersections

Level of Service	Signalized Intersection Delay (seconds/vehicle)	Stop Sign-Controlled and RAB Delay (seconds/vehicle)	Roadway Segment (v/c)
A	≤ 10	≤ 10	0.0 – 0.59
B	> 10-20	> 10-15	0.60 – 0.69
C	> 20-35	> 15-25	0.70 – 0.79
D	> 35-55	> 25-35	0.80 – 0.89
E	> 55-80	> 35-50	0.90 – 0.99
F	> 80	> 50	1.00>

3.1.1 Level of Service Standard

The following LOS designations describe Tumwater’s policy in the city and its urban growth area:

- For the designated “Urban Core Areas” LOS E is the acceptable standard of system performance. The Urban Core Areas are shown on **Figure 5** (Figure 9 of the Tumwater Master Plan).
- For the rest of the City and its urban growth area, LOS D will apply.
- The City has established Tumwater Strategy Corridors where the local LOS standard still applies, but it is acknowledged that some intersections or roadways may experience periodic congestion that exceeds the applicable standard. The Tumwater Strategy Corridors are also shown on **Figure 5**.

3.2 EXISTING OPERATIONS

Table 3 shows the existing level of service at each study intersection. For intersections under minor street stop-sign control, the LOS of the most difficult movement (typically the minor street left-turn) represents the intersection level of service for purposes of assessing potential impacts. The intersection average LOS is commonly used as the concurrency threshold for reviewing new development impacts. The operational analysis worksheets are provided in **Appendix A-5**.

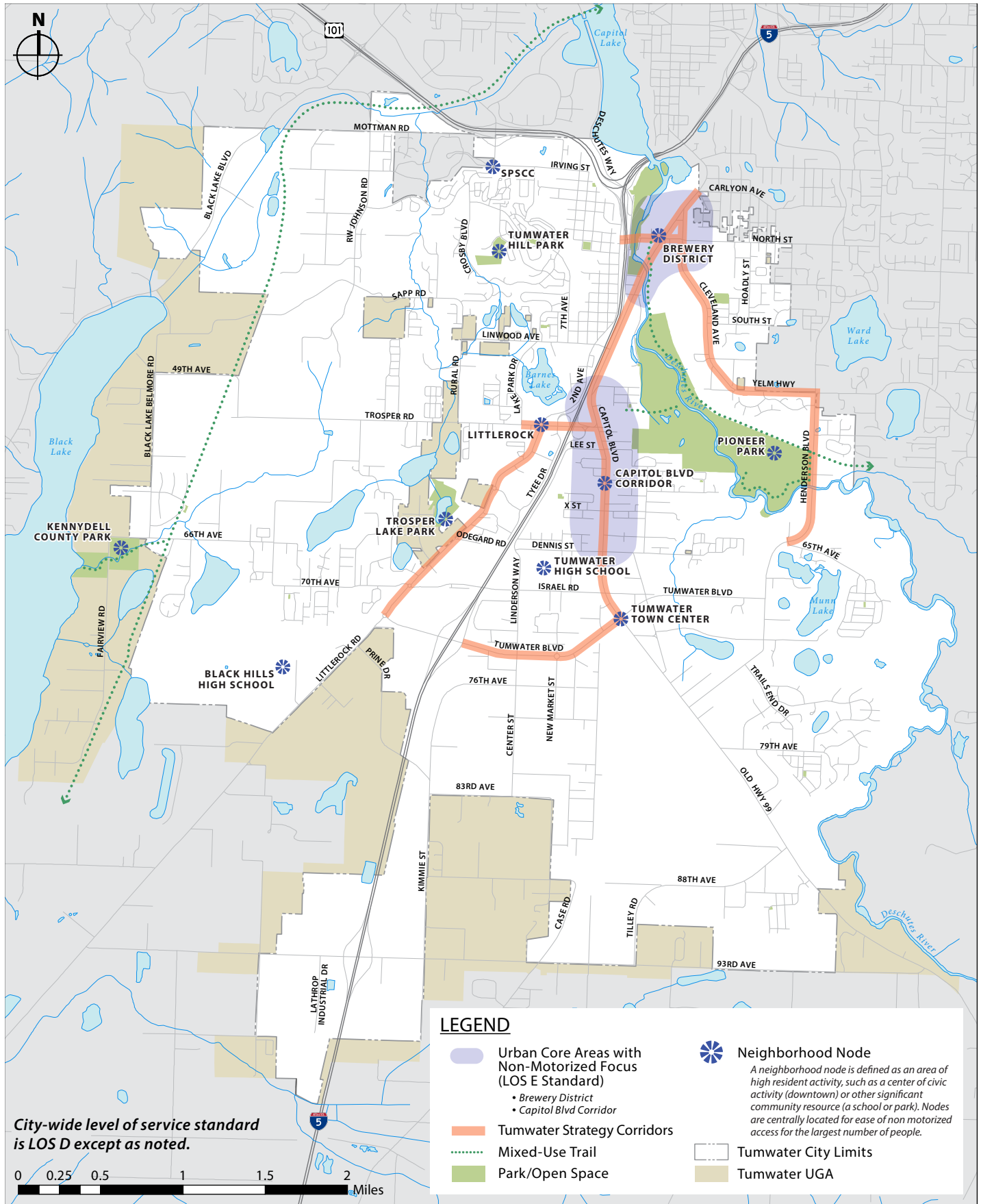


Table 3. Existing 2015 PM Peak Hour Level of Service

Number	Intersection	Intersection Control	2015 Base Year	
			LOS (Delay)	Worst v/c
1	RW Johnson Blvd/Mottman Rd	AWSC	B (12)	0.50
2	Crosby Blvd/Mottman Rd	Signal	B (16)	0.78
3	Crosby Blvd/Irving St	Signal	B (11)	0.59
4	7 th Ave/Irving St	AWSC	A (9)	0.25
5	Crosby Blvd/Barnes Blvd	TWSC	C (22)	0.22
6	Black Lake Blvd/Black Lake Belmore Rd	TWSC	E (37)	0.75
7	RW Johnson Blvd/Sapp Rd	TWSC	B (10)	0.17
8	Sapp Rd/Crosby Blvd	TWSC	B (12)	0.11
9	49 th Ave/Black Lake Belmore Rd ¹	TWSC	A (9)	
10	Capitol Blvd/Carlyon Ave/Sunset Way ²	Signal	B (10)	0.51
11	Deschutes Way/I-5 NB On-Ramp	Yield	A (9)	0.18
12	Deschutes Way/US 101 WB On-Ramp	Yield	A (10)	0.37
13	I-5/US 101 Off-Ramps/Desoto St/2 nd Ave ¹	TWSC	D (32)	
14	2 nd Ave/Custer Way	Signal	B (15)	0.79
15	Boston St/Custer Way	TWSC	D (30)	0.52
16	Deschutes Way/Boston St	AWSC	D (29)	0.87
17	Cleveland Ave/Capitol Blvd	TWSC	B (11)	0.35
18	Custer Way/Capitol Blvd	Signal	D (39)	0.90
19	Custer Way/North St/Cleveland Ave	Signal	D (48)	0.96
20	Hoadly St/North St	TWSC	C (20)	0.16
21	Deschutes Way/I-5 NB Off-Ramp ¹	TWSC	B (12)	
22	Capitol Blvd/E St	Signal	C (23)	0.83
23	Cleveland Ave/South St	TWSC	B (15)	0.06
24	7 th Ave/Linwood Ave	TWSC	C (18)	0.34
25	2 nd Ave/Linwood Ave	AWSC	C (25)	0.76
26	Capitol Blvd/Linwood Ave	Signal	B (17)	0.81
27	Henderson Blvd/Yelm Hwy	Signal	D (49)	1.01
28	Rural Rd/Trosper Rd	TWSC	C (16)	0.23
29	Lake Park Dr/Trosper Rd	Signal	B (14)	0.69
30	Littlerock Rd/Trosper Rd	Signal	D (42)	0.81
31	I-5 SB Ramps/Tyee Dr/Trosper Rd	Signal	D (45)	0.91
32	I-5 NB Ramps/Trosper Rd	Signal	A (7)	0.87
33	Capitol Blvd/Trosper Rd ³	Signal	F (30)	0.85
34	Capitol Blvd/Lee St ²	Signal	C (24)	0.86
35	Littlerock Rd/Fred Meyer Drwy/Costco Drwy	Signal	A (8)	0.51
36	Littlerock Rd/Costco Drwy ²	Signal	C (21)	0.79
37	Littlerock Rd/Kingswood Dr	RAB	A (6)	0.61
38	Capitol Blvd/X St	Signal	A (7)	0.49

Table 3 Cont. Existing 2015 PM Peak Hour Level of Service

Number	Intersection	Intersection Control	2015 Base Year	
			LOS (Delay)	Worst v/c
39	Elm St/X St	TWSC	A (10)	0.04
40	Capitol Blvd/Dennis St ²	Signal	B (12)	0.67
41	Capitol Blvd/Israel Rd	Signal	C (22)	0.82
42	66 th Ave/Black Lake Belmore Rd	TWSC	B (11)	0.18
43	Kirsop Rd/66 th Ave	TWSC	B (13)	0.21
44	Littlerock Rd/Odegard Rd	RAB	A (5)	0.59
45	Littlerock Rd/Israel Rd/70 th Ave	RAB	A (9)	0.61
46	Linderson Way/Israel Rd	Signal	B (17)	0.71
47	Littlerock Rd/Tumwater Blvd	RAB	A (8)	0.37
48	I-5 SB Ramps/Tumwater Blvd	Signal	B (12)	0.83
49	I-5 NB Ramps/Tumwater Blvd	TWSC	F (106)	0.66
50	Linderson Way/Tumwater Blvd	Signal	C (35)	1.09
51	New Market St/Tumwater Blvd	RAB	A (4)	0.32
52	Capitol Blvd/Tumwater Blvd	Signal	D (36)	0.93
53	65 th Ave/Henderson Blvd	Signal	A (7)	0.70
54	Tumwater Blvd/Henderson Blvd	Signal	C (34)	0.91
55	Trails End Dr/Henderson Blvd	TWSC	B (13)	0.22
56	Littlerock Rd/Black Hills School Drwy	Signal	A (3)	0.33
57	Center St/76 th Ave	TWSC	C (17)	0.19
58	Old Hwy 99/Henderson Blvd	Signal	B (13)	0.70
59	Old Hwy 99/79 th Ave	TWSC	F (64)	0.19
60	Kimmie St/83 rd Ave	TWSC	A (9)	0.08
61	Center St/83 rd Ave	TWSC	B (12)	0.33
62	Old Hwy 99/88 th Ave	Signal	A (9)	0.66
63	I-5 SB Ramps/93 rd Ave	Signal	B (20)	0.83
64	I-5 NB Ramps/93 rd Ave	TWSC	B (12)	0.24
65	Kimmie St/93 rd Ave	TWSC	C (21)	0.14
66	Case Rd/93 rd Ave	AWSC	C (20)	0.78
67	Tilley Rd (South)/93 rd Ave	AWSC	B (15)	0.62
68	Tilley Rd (North)/93 rd Ave	TWSC	B (14)	0.28
69	Old Hwy 99/93 rd Ave	TWSC	C (18)	0.37

1. Due to the unique nature of this intersection control, HCM cannot be used to calculate delay. Sim-Traffic simulation was used to calculate average delay.
2. HCM 2000 was used at this signal because the shared through-left lane is not accurately analyzed in HCM 2010.
3. This intersection is being graded based on the known congestion along Capitol Boulevard as a result of the signal.

3.3 2040 BASELINE CONDITIONS

To accommodate the Regional Transportation Projects included in the forecast model, several intersection improvements are assumed to be in place for the 2040 baseline condition. A brief summary

of the Regional Transportation Projects that affect study intersections and the impacted intersections are provided below:

3.3.1 Brewery District Plan

The Brewery District Plan aims to change the focus of the transportation network around the brewery properties to accommodate multiple modes of travel. Lane reductions along Custer Way and Capitol Blvd are planned to improve pedestrian and bicycle mobility. To accommodate these lane reductions, several roundabouts are planned. The following motorized facilities are impacted by this project:

- Capitol Blvd/Carlyon Ave/Sunset Way – Install Roundabout
- Boston Ave/Custer Way – Install Roundabout
- Deschutes Way/Boston St – Install Signal
- Capitol Blvd/Cleveland Ave – Install Roundabout
- Capitol Blvd/Custer Way – Install Roundabout
- Cleveland Ave/Custer Way/North St – Install Roundabout

3.3.2 E Street Extension

To provide congestion relief to the Custer Way corridor and facilitate the Brewery District Plan, an extension of E Street across Tumwater Valley to Cleveland Avenue is planned. To accommodate this improvement, the following study intersections will be affected:

- Capitol Blvd/E St intersection – Install Roundabout

3.3.3 Old Highway 99 Improvements

The widening of Old Highway 99 from 73rd Avenue to 88th Avenue is planned to accommodate growing traffic volumes to and from the area southeast of Tumwater. This widening project affects the following study intersections:

- Henderson Blvd/Old Hwy 99 – Install Roundabout
- 79th Ave/Old Hwy 99 – Include additional NB and SB through lane
- 88th Ave/Old Hwy 99 – Install Roundabout

3.3.4 Tumwater Boulevard Interchange

The Tumwater Boulevard Interchange will be rebuilt with a wider bridge crossing over I-5 and improved ramps. The following study intersections will be affected by this project:

- Tumwater Blvd/I-5 SB Ramps – Install Roundabout
- Tumwater Blvd/I-5 NB Ramps – Install Roundabout

The operational results for the 2040 baseline conditions are provided in **Table 4**. The intersections that fail to meet the proposed level of service standard are in bold.

Table 4. Projected 2040 Baseline PM Peak Hour Level of Service

Number	Intersection	Intersection Control	2040 Base Year	
			LOS (Delay)	Worst v/c
1	RW Johnson Blvd/Mottman Rd	AWSC	C (17)	0.73
2	Crosby Blvd/Mottman Rd	Signal	B (17)	0.64
3	Crosby Blvd/Irving St	Signal	B (12)	0.77
4	7 th Ave/Irving St	AWSC	B (10)	0.35
5	Crosby Blvd/Barnes Blvd	TWSC	F (60)	0.37
6	Black Lake Blvd/Black Lake Belmore Rd	TWSC	F (200+)	1.66
7	RW Johnson Blvd/Sapp Rd	TWSC	B (15)	0.40
8	Sapp Rd/Crosby Blvd	TWSC	C (21)	0.51
9	49 th Ave/Black Lake Belmore Rd ¹	TWSC	B (12)	
10	Capitol Blvd/Carlyon Ave/Sunset Way ²	RAB	B (12)	0.73
11	Deschutes Way/I-5 NB On-Ramp	Yield	A (9)	0.15
12	Deschutes Way/US 101 WB On-Ramp	Yield	B (11)	0.47
13	I-5/US 101 Off-Ramps/Desoto St/2nd Ave¹	TWSC	F (200+)	
14	2 nd Ave/Custer Way	Signal	D (40)	0.90
15	Boston St/Custer Way	RAB	B (12)	0.70
16	Deschutes Way/Boston St	Signal	C (20)	0.92
17	Cleveland Ave/Capitol Blvd	RAB	B (10)	0.66
18	Custer Way/Capitol Blvd	RAB	D (36)	1.03
19	Custer Way/North St/Cleveland Ave	RAB	B (13)	0.68
20	Hoady St/North St	TWSC	F (54)	0.52
21	Deschutes Way/I-5 NB Off-Ramp ¹	TWSC	D (30)	
22	Capitol Blvd/E St	RAB	D (38)	1.06
23	Cleveland Ave/South St	TWSC	C (21)	0.19
24	7 th Ave/Linwood Ave	TWSC	D (33)	0.68
25	2nd Ave/Linwood Ave	AWSC	F (58)	1.03
26	Capitol Blvd/Linwood Ave	Signal	D (44)	1.06
27	Henderson Blvd/Yelm Hwy	Signal	F (82)	1.13
28	Rural Rd/Trosper Rd	TWSC	F (53)	0.71
29	Lake Park Dr/Trosper Rd	Signal	B (14)	0.77
30	Littlerock Rd/Trosper Rd	Signal	E (58)	1.01
31	I-5 SB Ramps/Tyee Dr/Trosper Rd	Signal	D (50)	0.92
32	I-5 NB Ramps/Trosper Rd	TWSC	C (19)	0.37
33	Capitol Blvd/Trosper Rd	Signal	F (112)	1.31
34	Capitol Blvd/Lee St ²	Signal	C (25)	0.92
35	Littlerock Rd/Fred Meyer Drwy/Costco Drwy	Signal	A (10)	0.68
36	Littlerock Rd/Costco Drwy ²	Signal	C (27)	0.87
37	Littlerock Rd/Kingswood Dr	RAB	B (14)	1.01
38	Capitol Blvd/X St	Signal	A (10)	0.63
39	Elm St/X St	TWSC	A (10)	0.05

Table 4 Cont. Projected 2040 Baseline PM Peak Hour Level of Service

Number	Intersection	Intersection Control	2040 Base Year	
			LOS (Delay)	Worst v/c
40	Capitol Blvd/Dennis St ²	Signal	B (16)	0.76
41	Capitol Blvd/Israel Rd	Signal	D (42)	1.00
42	66 th Ave/Black Lake Belmore Rd	TWSC	C (16)	0.46
43	Kirsop Rd/66 th Ave	TWSC	C (19)	0.41
44	Littlerock Rd/Odegard Rd	RAB	A (5)	0.83
45	Littlerock Rd/Israel Rd/70 th Ave	RAB	C (25)	1.06
46	Linderson Way/Israel Rd	Signal	D (49)	1.15
47	Littlerock Rd/Tumwater Blvd	RAB	A (9)	0.64
48	I-5 SB Ramps/Tumwater Blvd	RAB	C (22)	0.99
49	I-5 NB Ramps/Tumwater Blvd	RAB	A (7)	0.67
50	Linderson Way/Tumwater Blvd	Signal	D (47)	1.27
51	New Market St/Tumwater Blvd	RAB	A (6)	0.42
52	Capitol Blvd/Tumwater Blvd	Signal	D (55)	1.41
53	65 th Ave/Henderson Blvd	Signal	B (10)	0.78
54	Tumwater Blvd/Henderson Blvd	Signal	D (45)	1.01
55	Trails End Dr/Henderson Blvd	TWSC	C (16)	0.31
56	Littlerock Rd/Black Hills School Drwy	Signal	A (4)	0.46
57	Center St/76 th Ave	TWSC	D (33)	0.46
58	Old Hwy 99/Henderson Blvd	RAB	B (11)	0.69
59	Old Hwy 99/79th Ave	TWSC	F (177)	0.67
60	Kimmie St/83 rd Ave	TWSC	B (11)	0.11
61	Center St/83 rd Ave	TWSC	C (15)	0.51
62	Old Hwy 99/88 th Ave	RAB	A (8)	0.53
63	I-5 SB Ramps/93 rd Ave	Signal	D (35)	1.07
64	I-5 NB Ramps/93rd Ave	TWSC	F (112)	1.06
65	Kimmie St/93 rd Ave	TWSC	D (34)	0.52
66	Case Rd/93rd Ave	AWSC	F (53)	1.30
67	Tilley Rd (South)/93rd Ave	AWSC	F (54)	1.28
68	Tilley Rd (North)/93rd Ave	TWSC	F (60)	0.78
69	Old Hwy 99/93rd Ave	TWSC	E (36)	0.67

1. Due to the unique nature of this intersection control, HCM cannot be used to calculate delay. Sim-Traffic simulation was used to calculate average delay.
2. HCM 2000 was used at this signal because the shared through-left lane is not accurately analyzed in HCM 2010.

3.4 PROPOSED CAPITAL IMPROVEMENTS

The City of Tumwater has, through different subarea studies and previous planning efforts, identified future roadway improvements that address the majority of the projected operational deficiencies, several of which are designed to improve network connectivity or secondary modes of travel. All of these previously identified improvement projects have been consolidated into the proposed project list,

with the inclusion of a few new improvements to address new projected operational deficiencies. These projects are summarized below by project type.

3.4.1 Roadway Improvements

R-1 Littlerock Road: Tumwater Blvd to Western City Limits

This is currently a two-lane facility running north/south and providing access from Tumwater to southwest Thurston County. It is planned to be widened to three lanes in the future, providing a two-way left-turn lane (TWLTL). This roadway is a primary entry point to the City, and the current volume projections approach the threshold for multiple through lanes each direction. It is suggested that the roadway operations be monitored and that all future development along the roadway be set back to accommodate a five-lane section.

R-2 Tyee Drive: Bishop Rd to Israel Rd

Tyee Drive is currently a two-lane roadway traveling parallel to Littlerock and providing access to the commercial properties. This project would extend Tyee Drive from its current southern terminus at Bishop Road, south to Israel Road. This extension will be a two lane roadway and will include the installation of a roundabout at Israel Road.

R-3 Tyee Drive: Israel Rd to Tumwater Blvd

This project will continue the extension of Tyee Drive south to Tumwater Blvd. This portion of Tyee Drive is currently planned to be four/five lanes, however the need for this additional capacity should be reassessed as the surrounding properties are developed.

R-4 Tyee Drive: Tumwater Blvd to Prine Dr

This project will continue the extension of Tyee Drive south to Prine Dr. This portion of Tyee Drive will continue to be planned for four/five lanes. As with project R-3, the need for the additional width should be reassessed as the adjacent properties are developed.

R-5 Tyee Drive: Prine Dr to Littlerock Rd

This project will complete the extension of Tyee Drive, connecting into Littlerock Road at the existing Black Hills High School driveway. This portion of Tyee Drive will serve residential properties and is planned as a three lane roadway. This project will also include improvements to the traffic signal at Black Hills High School driveway/Littlerock Rd

R-6 Trosper Road: Lake Park Dr to Rural Rd

This roadway is currently two lanes with on-street parking provided at the west end of the segment and partial bicycle lanes. Repurposing the existing asphalt will allow this roadway to be converted into a three lane section with continuous bicycle lanes.

R-7 Tumwater Boulevard: Capitol Blvd to Henderson Blvd

This roadway is currently two lanes. This improvement will widen Tumwater Blvd to three lanes and include intersection improvements at Bonniewood Dr.

R-8 Tumwater Boulevard: I-5 Interchange

The Tumwater Boulevard interchange is currently a three-lane bridge with stop-control for the NB ramps and signal control for the SB ramps. This improvement will install roundabouts at both ramp terminals and widen the bridge to accommodate these roundabouts. Since WSDOT has jurisdiction over the interchange, this will become a WSDOT project.

R-9 Tumwater Boulevard: Tyee Dr extension to I-5 SB Ramps

Currently this portion of Tumwater Boulevard is three lanes, with two travel lanes eastbound and one travel lane westbound. With the completion of Tyee Dr, this portion of Tumwater Boulevard is projected to experience an increase in traffic. This improvement will widen Tumwater Boulevard to five lanes, providing two travel lanes in each direction and a TWLTL.

R-10 E Street: Capitol Blvd to Cleveland Ave

Currently E Street is a short two-lane roadway connecting Deschutes Way to Capitol Blvd. To facilitate better network connectivity and relieve congestion along Custer Way, this improvement will extend E Street east across the Deschutes River valley to Cleveland Ave. This extension will be four lanes will also provide access to valley floor properties on the east side of the railroad tracks. A separate access is planned for properties on the west side of the railroad tracks. This project will include the installation of roundabouts at Capitol Blvd and Cleveland Ave.

R-11 Old Highway 99: Tumwater Blvd to 73rd Ave

This section of Old Highway 99 is currently a two-lane roadway south Tumwater Blvd. This improvement will widen Old Highway 99 to five lanes and has already been funded.

R-12 Old Highway 99: 73rd Ave to 88th Ave

This section of Old Highway 99 is currently two lanes. This improvement will widen Old Highway 99 to five lanes, continuing the widening of project R-11 south. This project will include intersection improvements at Bonniewood Dr, Henderson Blvd and 88th Ave. The Henderson Blvd and 88th Ave intersections will be converted from signals to roundabouts. This improvement is a Regional Transportation Project.

R-13 Old Highway 99: 88th Ave to 93rd Ave

This portion of Old Highway 99 is currently two lanes. This improvement will widen Old Highway 99 to three lanes, adding a TWLTL and/or median section. The projected 2040 volumes are approaching the threshold for a five-lane section and it is recommended that future development along this segment be constructed with setbacks adequate to accommodate five lanes. To realize full benefit of a five lane roadway section would require Old Highway 99 to be widened to five lanes past the southern boundary of the Tumwater UGA. The segments of Old Highway 99 north and south of 93rd Ave should continue to be monitored.

R-14 Henderson Boulevard: Tumwater Blvd to 65th Ave

This portion of Henderson Boulevard is currently a two-lane roadway. This improvement will widen Henderson Boulevard to three lanes, providing left-turn lanes at intersecting roadways and a TWLTL or a median along the rest of the segment.

R-15 Henderson Boulevard: Old Hwy 99 to Tumwater Blvd

This portion of Henderson Boulevard is currently a two-lane roadway. This improvement will widen Henderson Boulevard to three lanes, providing left-turn lanes at intersecting roadways and a TWLTL or a median along the rest of the segment.

R-16 32nd Avenue: Ferguson St to Black Lake Blvd

32nd Avenue is currently a three-lane roadway between RW Johnson Blvd and Ferguson St, with single travel lanes in each direction and a TWLTL. This improvement will extend 32nd Avenue west to Black Lake Blvd, continuing the three lane section. This improvement will include intersection improvements at Black Lake Blvd. This project will be constructed as development occurs in the surrounding area, and is expected to be developer funded.

R-17 70th Avenue: Kirsop Rd to 73rd/66th Connector

70th Avenue is currently a two-lane roadway. This improvement will extend 70th Avenue west to a future north/south roadway to provide access to the property west of Black Hills High School. This extension will be a three-lane roadway, including a TWLTL. The project will include intersection improvements at Kirsop Rd. This improvement will occur as the property west of Black Hills High School develops, and is expected to be developer funded.

R-18 73rd Avenue: Prine Dr extension to 73rd/66th Connector

73rd Avenue is currently a two-lane road serving a small community of homes east of Littlerock Rd. This project will construct a new segment of 73rd Avenue west of Littlerock Rd, between the extension of Prine Dr and a future north/south roadway further west. This new roadway will be three lanes and will serve the future development of property west of Black Hills High School. It will be constructed as development occurs and the need for a third lane will be reassessed at that time. It is expected to be developer funded.

R-19 Prine Drive: Tyee Dr to 73rd Ave

Prine Drive is currently a two lane neighborhood road east of Littlerock Rd. This improvement will extend Prine Drive west to the proposed 73rd Ave roadway and will widen the existing segment of Prine Drive between Littlerock Rd and the Tyee Dr extension. This roadway improvement is part of the proposed access plan for the property west of Black Hills High School and will be constructed as development occurs. It is expected to be developer funded.

R-20 93rd Avenue: Lathrop Industrial Dr to I-5 SB Ramps

This portion of 93rd Avenue is currently a two lane roadway. This improvement will widen 93rd Avenue to five lanes, providing two lanes in each direction and either a TWLTL or a median. This project will include

intersection improvements at Lathrop Industrial Dr. This improvement is driven by the expected development of properties on both sides of 93rd Avenue. The additional through-lanes will add/drop at Lathrop Industrial Dr.

R-21 SR 121 (93rd Avenue): I-5 NB Ramps to Kimmie St

This portion of 93rd Avenue is currently two lanes. This improvement will widen 93rd Avenue to five lanes, providing two lanes in each direction and a TWLTL. This improvement will include intersection improvements at Kimmie St.

R-22 SR 121 (93rd Avenue): Kimmie St to Tilley Rd (south)

This portion of 93rd Avenue is two lanes. This improvement will add a TWLTL, creating a three lane roadway. Previous studies have found that a five lane section may be needed along this portion of 93rd Avenue, depending on how the area develops. As development occurs, setbacks should allow for a five lane roadway.

R-23 93rd Avenue: Lathrop Industrial Dr to Western City Limits

This segment of 93rd Avenue is currently a two-lane roadway. This improvement will widen 93rd Avenue to include a TWLTL or median control.

R-24 SR 121 (93rd Avenue): I-5 Interchange

Currently the interchange bridge over I-5 is two lanes. As the properties on each side of I-5 develop, the bridge will require widening. This improvement will widen the bridge to five lanes, providing two travel lanes and left-turn pockets for both on-ramps. It is anticipated that this will become a WSDOT project.

R-25 6th Avenue: T St to Lee St

This project is to construct a new north/south roadway west of Capitol Blvd. With the completion of the Trosper Rd interchange project, the NB ramps will be relocated to 6th Avenue north of this location. This improvement will extend the new roadway south to Lee St to provide better network connectivity. It will be a three-lane roadway and will include intersection improvements at Lee St.

R-26 Custer Way: Boston St to Cleveland Ave

This project is a part of the Brewery District Plan. Currently this portion of Custer Way is a four-lane road with sidewalk and no bicycle lanes. The improvement will reduce the travel lanes to three, with the EB direction providing a single through lane and the WB direction providing two through lanes. This lane reduction will allow for the addition a median and an EB bicycle lane. This project requires the construction of roundabouts at brewery area intersections, projects I-2, I-4, I-6, I-7 and I-8.

R-27 Capitol Boulevard: E St to Cleveland Ave

This project is a part of the Brewery District Plan. Currently this segment of Capitol Boulevard is five lanes, with sidewalks and no bicycle lanes. This improvement will reduce the travel lanes to three, providing one NB lane and two SB lanes. With this lane reduction a center median will be installed and

bicycle lanes will be constructed in both directions. This improvement requires the construction of roundabouts at brewery area intersections, projects I-2, I-4, I-6, I-7 and I-8.

R-28 Capitol Boulevard: Cleveland Ave to Carlyon Ave

This improvement is a part of the Brewery District Plan. This section of Capitol Boulevard is currently five lanes with sidewalks and no bicycle lanes. This project will reduce the travel lanes to four, with two lanes in each direction. With this reduction bicycle lanes and a center median will be constructed. This improvement requires the construction of roundabouts at brewery area intersections, projects I-2, I-4, I-6, I-7 and I-8.

R-29 Capitol Boulevard: Israel to M St

This project is a part of the Capitol Boulevard Corridor Plan. This section of Capitol Boulevard currently provides five travel lanes and sidewalks, with no bicycle lanes. The improvement will remove the TWLTL, allowing for the addition of bicycle lanes in both directions and a raised median. This project requires the construction of roundabouts along the corridor, projects I-15, I-16, I-17 and I-18

R-30 North/South Connector: Lee St to Trosper Rd

This project is a part of the Capitol Boulevard Corridor Plan. This improvement will construct a new north/south roadway east of Capitol Blvd. The roadway will provide two travel lanes, and bicycle lanes in both directions. This improvement will provide better access to the commercial properties.

R-31 Odegard Road: Littlerock Rd to Tyee Dr

Odegard Road is currently a two lane roadway extending east from Littlerock Rd, providing access to a small collection of residential units. This improvement constructs a three-lane extension of Odegard Road east to the proposed Tyee Dr extension, providing enhanced network connectivity.

R-32 Bishop Road: Littlerock Rd to Tyee Dr

Bishop Road is currently a two-lane roadway extending east from Littlerock Rd, providing access to commercial and residential properties. This improvement will construct a three lane extension of Bishop Road east to the proposed Tyee Dr extension, providing enhanced network connectivity.

R-33 73rd/66th Connector: 66th Ave to 73rd Ave

This project will construct a new north/south roadway west of Black Hills High School, connecting 66th Ave and 73rd Ave. It will be constructed as a three-lane roadway and will be constructed as development occurs. It is expected to be developer funded.

R-34 New Market Street: Tumwater Blvd to Israel Rd

Currently New Market Street is a two-lane roadway extending north from Tumwater Blvd and providing access to the New Market Skills Center. This improvement will construct a three-lane extension of New Market Street north to Israel Rd.

R-35 Town Center Connector: Tumwater Blvd to Israel Rd

This project will construct a new north/south three-lane roadway east of New Market St, connecting Tumwater Blvd and Israel Rd.

R-36 72nd Avenue: Cleanwater Dr to Linderson Way

This roadway is currently a site access road to property west of Tumwater Blvd. This improvement will improve the existing roadway to a three lane roadway and construct an extension east to Linderson Way, providing a parallel route to Tumwater Blvd to enhance connectivity for the properties north of Tumwater Blvd.

R-37 Doelman Property: South of 73rd Ave

The Doelman property is located south of 73rd Avenue and west of Black Hills High School. This property will construct an internal roadway network to serve the future development, and is expected to be developer funded.

R-38 Trosper Road Interchange: NB Ramps

The existing NB ramps for the Trosper Road interchange provide right turn on-ramp movements in both directions and a full access off-ramp. To address the projected deficiency at Trosper Rd/Capitol Blvd, this improvement will relocate the NB ramp termini south of Trosper Road. The current ramps will be constructed as 6th Ave and provide limited access to Trosper Road. The WB to NB right turn on-ramp will remain. Traffic traveling NB on Capitol Blvd will be able to access the NB on-ramp south of Trosper Road, using Lee St and 6th Ave. This project will include improvements to the existing NB Ramp intersection.

R-39 Deschutes Way: E St to US 101 On-ramp

This portion of Deschutes Way is currently two travel lanes with sidewalks and no bicycle lanes. Parking is provided on the west side of the road south of Boston St and on the east side of the road north of Boston St. Multiple improvement alternatives are still under consideration for this roadway, designed to accommodate the additional traffic as a result of the E St extension. The final design recommendation will be determined in the E St extension study.

3.4.2 Intersection Improvements

I-1 Black Lake Belmore at Black Lake Boulevard

This intersection is currently under stop-sign control for the minor street approach, Black Lake Belmore. The intersection is projected to operate at an LOS F in 2040. This project will construct a single lane roundabout.

I-2 Capitol Boulevard at Carlyon Avenue/Sunset Way

This intersection is currently under traffic signal control. It has an unusual layout, with both Carlyon Ave and Sunset Way being WB approaches. This intersection is not projected to have operational issues in the future, but to accommodate the Brewery District Plan improvements along Capitol Boulevard this improvement will construct a two lane roundabout. A roundabout will also better accommodate the unusual intersection configuration.

I-3 2nd Avenue at Custer Way

This intersection is currently under traffic signal control. The projected intersection operations do not require improvements, but the upstream I-5/US-101 off-ramp intersection projects to operate an LOS F. To improve the operations of the upstream intersection, this improvement will restripe the SB approach to convert the existing through lane into a shared through-left lane, providing a second SB left-turn lane. This will greatly improve the lane utilization at the upstream intersection, and will also improve the projected operations at this intersection.

I-4 Boston Street at Custer Way

This intersection currently operates under stop sign-control for the minor street approaches. The NB approach is restricted to through and right turn movements. The Brewery District Plan includes a roundabout at this location to facilitate the lane reduction along Custer Way. This improvement will construct a teardrop roundabout at this location, with the east side of the roundabout connecting to a median and limiting the NB approach to right-turns only.

I-5 Deschutes Way at Boston St

This intersection is currently under all-way stop-control. With the construction of the E Street crossing this intersection will experience a large increase of through traffic along Deschutes Way, which will result in the operations falling below the proposed level of service standard. This improvement will install a traffic signal as a part of the Brewery District Plan.

I-6 Capitol Boulevard at Cleveland Ave

This intersection currently operates under stop-control for the Cleveland Avenue approach. Due to the approach angle of the NB Capitol Boulevard and NB Cleveland Avenue approaches, the Cleveland Ave approach only allows a right-turn movement. This improvement will construct a two lane roundabout, to better serve the existing approach angles and to facilitate the Brewery District Plan's lane reduction along Capitol Boulevard.

I-7 Capitol Boulevard at Custer Way

This intersection is currently operated with a traffic signal. To accommodate the lane reductions along both Custer Way and Capitol Boulevard proposed in the Brewery District Plan, this improvement will construct a two-lane roundabout.

I-8 Cleveland Avenue at Custer Way/North Street

This intersection is currently operated with a traffic signal. As part of the Brewery District Plan, this improvement will construct a two lane roundabout to accommodate the lane reduction along Custer Way.

I-9 Linwood Avenue at 2nd Avenue

This intersection is currently under all-way stop-control. The projected intersection operations are below the proposed level of service standard. This improvement will construct a two-lane roundabout.

I-10 Capitol Boulevard at Linwood Avenue

This intersection is currently under traffic signal control. Although the projected operational analysis is within the proposed level of service standard, to accommodate the median treatment along Capitol Boulevard proposed in the Capitol Boulevard Corridor Plan, this improvement will construct a two-lane roundabout.

I-11 Henderson Avenue at Yelm Highway

This intersection currently operates under traffic signal control. The existing operational analysis results suggests the intersection may experience operational issues in the near future. The projected 2040 analysis falls below the proposed level of service standard. This improvement will widen the WB approach to provide a 2nd left-turn lane. Construction of a two lane roundabout could also provide the same operational benefit. Both improvements present right-of-way challenges. A future intersection design study would identify the preferred solution.

I-12 Trosper Road at Rural Road

This intersection is currently under stop sign-control for Rural Road. The projected 2040 operational analysis will fall below the proposed level of service standard. This improvement will construct an EB left-turn lane. This and the addition of a TWLTL on Trosper Road east of Rural Road completed in project R-6 will allow for the intersection to remain under stop-sign control.

I-13 Trosper Road at 2nd Avenue/Littlerock Road

This intersection is currently under traffic signal control. The projected 2040 level of service is expected to be within the proposed level of service standard, but with some long queues during the peak periods. To provide congestion relief and improve the operations of the intersection, this improvement will construct a two lane roundabout. Due to the close proximity to the Trosper Road/Tyee Drive intersection, this improvement must be constructed with I-14.

I-14 Trosper Road at Tyee Drive/I-5 SB Ramps

This intersection is currently under traffic signal control. The projected 2040 operations are within the proposed LOS Standard, but with heavy congestion along most of the approaches. To improve the projected congestion, this improvement will construct a two lane roundabout. This improvement will require project I-13 to be completed. Construction of a roundabout should also improve the safety performance of the intersection by improving the alignment of the north and south approaches.

I-15 Trosper Road at Capitol Boulevard

Currently this intersection is under traffic signal control. While the existing level of service is within the LOS standard, the current congestion and extended queues experienced during the PM peak period results in this intersection being graded as failing. The Trosper Road interchange improvement, project R-38, was developed to address the existing and projected operational issues at this intersection. This improvement will construct a two-lane roundabout.

I-16 T Street at Capitol Boulevard

This intersection is currently stop sign-controlled. Future redevelopment of the WSDOT Olympic Region property is expected to use T Street as a primary access, which will require intersection improvements. As part of the Capitol Boulevard Corridor Plan and to accommodate the Trosper Road interchange improvement, this project will construct a two-lane roundabout. With the completion of the 6th Avenue roadway project, project R-25, this roundabout will allow for the existing traffic signal at Lee Street to be removed, creating better intersection control spacing along Capitol Boulevard.

I-17 X Street at Capitol Boulevard

This intersection currently operates under traffic signal control. As part of the Capitol Boulevard Corridor Plan, this improvement will construct a two-lane roundabout. This improvement is not needed to improve an operational deficiency, but will facilitate the redevelopment of Capitol Boulevard.

I-18 Dennis Street at Capitol Boulevard

This intersection currently operates under traffic signal control. As part of the Capitol Boulevard Corridor Plan, this improvement will construct a two-lane roundabout. This improvement is not needed to improve an operational deficiency, but will facilitate the redevelopment of Capitol Boulevard.

I-19 Old Highway 99 at 79th Avenue

This intersection is currently under stop sign-control for the 79th Avenue approach. The minor street movement currently operates below the accepted LOS standards, but the volumes are not sufficient to meet traffic signal warrants. In the future the volumes on Old highway 99 are expected to grow enough that intersection control improvements become warranted. This improvement will construct a two-lane roundabout.

I-20 93rd Avenue at I-5 Northbound Ramps

Currently this intersection operates under stop sign-control for the I-5 NB off-ramp. This intersection is projected to operate below the proposed LOS standard in 2040. This improvement will construct a traffic signal.

I-21 93rd Avenue at Kimmie Street

This intersection currently operates with stop sign-control for both approaches of Kimmie Street. Based on the volume projections from the travel demand model, this intersection will operate within the proposed LOS standards. Previous studies have identified operational deficiencies at this location, and if the properties along 93rd Avenue develop, improvements will be needed. This project will construct a traffic signal, which should be built as development occurs.

I-22 93rd Avenue at Case Road

This intersection currently operates under all-way stop-control. This intersection is projected to operate below the proposed LOS standard in 2040. This project is currently identified on the City's traffic impact fee program and will construct a single-lane roundabout. This roundabout should be designed to accommodate widening of 93rd Avenue to five lanes.

I-23 93rd Avenue at Tilley Road (south)

Currently this intersection operates with all-way stop-control. The projected 2040 operational results are below the proposed LOS standard. This improvement will construct a single-lane roundabout. Should median control be implemented along 93rd Avenue between Tilley Road and Case Road, construction of this roundabout would be required.

I-24 93rd Avenue at Tilley Road (north)

This intersection currently operates under all-way stop-control. This intersection is projected to operate below the proposed LOS standard in 2040. This improvement will construct a single-lane roundabout.

I-25 93rd Avenue at Old Highway 99

This intersection is currently operated with stop sign control for the 93rd Avenue approach. Currently acceleration lanes have been constructed for both NB and SB directions on Old Highway 99. As traffic volumes increase along Old Highway 99, these acceleration lanes will not be sufficient to accommodate the traffic on 93rd Avenue. This improvement will construct a single-lane roundabout. This roundabout should be designed to accommodate future widening along Old Highway 99.

3.4.3 Additional Intersection Deficiencies

With completion of the entire roadway and intersection project lists, the projected 2040 operational analysis still indicates a few locations that may operate below the proposed LOS standard. Here is a brief description of these locations:

Crosby Boulevard at Barnes Road

This intersection is projected to operate at an LOS F for the EB approach and an LOS E for the WB approach. The EB approach serves as a driveway for a small apartment complex and has very low peak hour volumes. The WB approach has more volume, but the heavy movement is right-turning traffic, which is provided with a separate turn lane. The peak hour traffic signal volume warrants were reviewed at this location and the forecasted volumes don't meet applicable traffic volume thresholds. This intersection should be monitored, but until signal warrants can be met no intersection improvements are proposed.

Hoadly Street at North Street

This intersection is currently stop sign-controlled for the north and south approaches. The projected 2040 operational analysis indicates the SB approach will operate at an LOS F. This is a low volume approach and is not projected to meet the peak hour traffic signal volume warrant. This intersection should be monitored, but until signal warrants can be met no intersection improvements are proposed.

3.4.4 Roadway Deficiencies

A planning level evaluation of roadway segments was prepared for most collector and arterial roadway segments within the study area. The analysis was based on the volume to capacity ratio (v/c). In this analysis the roadway capacities used were taken from the TRPC Regional demand model. In general, these capacities tend to be conservatively low and offer a "first-screening" of roadways that may be approaching capacity difficulties. In most urban settings the intersections are what determine the

success of the roadway segments. However, in some instances it may be appropriate to consider addressing roadway segment capacity deficiencies, in the following ways:

- Adding through capacity lanes
- Improving signal progression
- Adding right and/or left-turn lanes at intersections
- Adding a continuous two-way left-turn lane or center median
- Consolidating driveways to reduce conflicts

The roadway segment analysis results are provided on **Figures 10, 11 and 12** of the Tumwater Master Plan. The complete roadway segment analysis results are provided in Appendix A-4. Below is a discussion of some of the notable roadway segments.

Henderson Boulevard - Between 65th Avenue and Yelm Highway

Currently this portion of Henderson Boulevard is a two lane roadway with turn lanes at all significant intersections. The 2040 roadway segment analysis indicates that Henderson Blvd will have a v/c ratio greater than 1.0. Given that the intersections already have turn lanes provided, the only meaningful improvement to address the projected volume would be additional through lanes. This segment of Henderson Boulevard has multiple geographic constraints that make roadway widening undesirable. Since the current corridor is built to the long term vision for this roadway, Henderson Boulevard has been designated a Tumwater Strategy Corridor. This roadway should continue to be monitored.

Deschutes Way – Between E Street and US-101 Ramps

This portion of Deschutes Way is currently a two lane roadway. With the completion of the E Street extension Deschutes Way will experience an increase in volume accessing the US-101 and I-5 on-ramps. This roadway is included on the Capital Improvements list, with the exact roadway improvement to be determined in the E Street extension study. Eventually, either with this initial improvement or a future improvement, a 2nd NB travel lane may be needed to accommodate this growth in volume.

Israel Road – Between Linderson Way and Littlerock Road

This portion of Israel Road is a two lane section. The projected 2040 v/c ratio indicates this roadway will operate with a v/c ratio above 1.0. Given the current lack of driveway interruptions along this portion of Israel Road, the intersection analysis at Israel Rd/Linderson Way and Israel Rd/Littlerock Rd should provide a more meaningful indication of how Israel Road is operating. As development occurs on this segment of Israel Road, additional right-turn or left-turn lanes and/or turn movement restrictions at cross-streets may need to be evaluated to minimize friction on through traffic.

Linderson Way – Between Tumwater Boulevard and Israel Road

Linderson Way north of Tumwater Boulevard is currently a five lane section, which narrows down to three lanes north of 73rd Avenue until Israel Road. Based on the existing counts, this roadway has a v/c ratio above 1.0 during the PM peak hour SB approaching Tumwater Boulevard. Congestion on this roadway tends to be of short duration as the office buildings generate spikes of outbound traffic. As traffic increases this roadway should be monitored for potential efficiency improvements including right turn lanes at cross-streets/major driveways.

Old Highway 99 – South of 93rd Avenue

This portion of Old Highway 99 is currently a two lane section. The segments of Old Highway 99 north of 93rd Avenue are listed in the Capital Improvements list, widening to five lanes north of 88th Avenue and to three lanes between 88th Avenue and 93rd Avenue. As growth continues south of the City, this roadway may require additional through lanes. Although this improvement may not provide meaningful benefit unless it extends south beyond the City boundary.

3.5 2040 WITH PROPOSED CAPITAL IMPROVEMENTS

The operational results were prepared for 2040 volume conditions with the proposed improvements in place for affected intersections. The 2040 operational analysis results with the proposed improvements are provided in **Table 5**.

Table 5. Projected 2040 With Improvements PM Peak Hour Level of Service

Number	Intersection	Existing Intersection Control	Improvement	2040 With Improvement	
				LOS (Delay)	Worst v/c
6	Black Lake Blvd/Black Lake Belmore Rd	TWSC	RAB	B (11)	0.64
13	I-5/US 101 Off-Ramps/Desoto St/2 nd Ave	TWSC	Lanes	E (50)	
14	2 nd Ave/Custer Way	Signal	Lanes	C (25)	0.85
25	2 nd Ave/Linwood Ave	AWSC	RAB	B (19)	0.80
26	Capitol Blvd/Linwood Ave	Signal	RAB	B (17)	0.84
27	Henderson Blvd/Yelm Hwy	Signal	Signal	D (55)	1.01
28	Rural Rd/Trosper Rd	TWSC	Lanes	C (18)	0.37
30	2 nd Ave/Littlerock Rd/Trosper Rd	Signal	RAB	C (32)	0.96
31	Tyee Dr/SB I-5 Ramps/Trosper Rd	Signal	RAB	C (23)	0.92
33	Capitol Blvd/Trosper Rd	Signal	RAB	C (26)	0.94
38	Capitol Blvd/X St	Signal	RAB	A (8)	0.50
40	Capitol Blvd/Dennis St	Signal	RAB	A (9)	0.56
56	Littlerock Rd/Black Hills School Drwy	Signal	Lanes	C (27)	0.83
59	Old Hwy 99/79 th Ave	TWSC	RAB	A (8)	0.59
63	I-5 SB Ramps/93 rd Ave	Signal	Lanes	B (15)	0.67
64	I-5 NB Ramps/93 rd Ave	TWSC	Signal	A (9)	0.77
65	Kimmie St/93 rd Ave	TWSC	Signal	B (14)	0.73
66	Case Rd/93 rd Ave	AWSC	RAB	B (16)	0.79
67	Tilley Rd (South)/93 rd Ave	AWSC	RAB	B (17)	0.79
68	Tilley Rd (North)/93 rd Ave	TWSC	RAB	B (12)	0.71
69	Old Hwy 99/93 rd Ave	TWSC	RAB	C (24)	0.92

1. Due to the unique nature of this intersection control, HCM cannot be used to calculate delay. Sim-Traffic simulation was used to calculate average delay.
2. HCM 2000 was used at this signal because the shared through-left lane is not accurately analyzed in HCM 2010.

3.6 2022 BASELINE CONDITIONS

The Capital Facilities Plan contains all the perceived roadway and intersection improvements the City will need to construct to maintain the proposed LOS standards in 2040. To determine which of these improvements may be warranted or needed in the short term, a 2022 analysis was performed.

To prepare the analysis volumes for the 2022 analysis, a 2040 forecast was prepared using the TRPC travel demand model, with all of the regional transportation projects removed. Then a portion of the model growth between the existing 2014 travel demand model and this unimproved 2040 travel demand model was added to the existing 2015 turning movement counts to produce 2022 analysis volumes. The operational results for these intersections are provided below in **Table 6**.

Table 6. Projected 2022 PM Peak Hour Level of Service

Number	Intersection	Intersection Control	2022 Base Year	
			LOS (Delay)	Worst v/c
1	RW Johnson Blvd/Mottman Rd	AWSC ¹	B (13)	0.55
2	Crosby Blvd/Mottman Rd	Signal	B (17)	0.77
3	Crosby Blvd/Irving St	Signal	B (10)	0.67
4	7 th Ave/Irving St	AWSC	A (9)	0.26
5	Crosby Blvd/Barnes Blvd	TWSC ²	D (29)	0.26
6	Black Lake Blvd/Black Lake Belmore Rd	TWSC	F (72)	0.96
7	RW Johnson Blvd/Sapp Rd	TWSC	B (11)	0.23
8	Sapp Rd/Crosby Blvd	TWSC	B (13)	0.23
9	49 th Ave/Black Lake Belmore Rd ¹	TWSC	A (9)	
10	Capitol Blvd/Carlyon Ave/Sunset Way ²	Signal	B (11)	0.49
11	Deschutes Way/I-5 NB On-Ramp	Yield	A (9)	0.19
12	Deschutes Way/US 101 WB On-Ramp	Yield	A (10)	0.40
13	I-5/US 101 Off-Ramps/Desoto St/2 nd Ave ¹	TWSC	C (24)	
14	2 nd Ave/Custer Way	Signal	C (31)	1.10
15	Boston St/Custer Way	TWSC	E (42)	0.58
16	Deschutes Way/Boston St	AWSC	E (41)	0.95
17	Cleveland Ave/Capitol Blvd	TWSC	B (13)	0.43
18	Custer Way/Capitol Blvd	Signal	E (60)	1.00
19	Custer Way/North St/Cleveland Ave	Signal	E (70)	1.15
20	Hoadly St/North St	TWSC	C (23)	0.19
21	Deschutes Way/I-5 NB Off-Ramp ¹	TWSC	D (26)	
22	Capitol Blvd/E St	Signal	C (33)	0.87
23	Cleveland Ave/South St	TWSC	C (16)	0.07
24	7 th Ave/Linwood Ave	TWSC	C (20)	0.43
25	2 nd Ave/Linwood Ave	AWSC	E (38)	0.93
26	Capitol Blvd/Linwood Ave	Signal	C (28)	1.00
27	Henderson Blvd/Yelm Hwy	Signal	E (68)	1.13
28	Rural Rd/Trosper Rd	TWSC	C (20)	0.30
29	Lake Park Dr/Trosper Rd	Signal	B (14)	0.72
30	Littlerock Rd/Trosper Rd	Signal	D (44)	0.83
31	I-5 SB Ramps/Tyee Dr/Trosper Rd	Signal	D (46)	0.92
32	I-5 NB Ramps/Trosper Rd	Signal	A (7)	0.89
33	Capitol Blvd/Trosper Rd ³	Signal	F (31)	0.89
34	Capitol Blvd/Lee St ²	Signal	C (26)	0.88
35	Littlerock Rd/Fred Meyer Drwy/Costco Drwy	Signal	A (8)	0.59
36	Littlerock Rd/Costco Drwy ²	Signal	C (22)	0.84
37	Littlerock Rd/Kingswood Dr	RAB	A (6)	0.75
38	Capitol Blvd/X St	Signal	A (8)	0.53

Table 6 Cont. Projected 2022 PM Peak Hour Level of Service

Number	Intersection	Intersection Control	2022 Base Year	
			LOS (Delay)	Worst v/c
39	Elm St/X St	TWSC	A (10)	0.04
40	Capitol Blvd/Dennis St ²	Signal	B (13)	0.71
41	Capitol Blvd/Israel Rd	Signal	C (25)	0.85
42	66 th Ave/Black Lake Belmore Rd	TWSC	B (12)	0.25
43	Kirsop Rd/66 th Ave	TWSC	B (15)	0.28
44	Littlerock Rd/Odegard Rd	RAB	A (5)	0.68
45	Littlerock Rd/Israel Rd/70 th Ave	RAB	B (11)	0.76
46	Linderson Way/Israel Rd	Signal	B (19)	0.76
47	Littlerock Rd/Tumwater Blvd	RAB	A (8)	0.49
48	I-5 SB Ramps/Tumwater Blvd	Signal	B (13)	0.87
49	I-5 NB Ramps/Tumwater Blvd	TWSC	F (200+)	1.47
50	Linderson Way/Tumwater Blvd	Signal	D (37)	1.09
51	New Market St/Tumwater Blvd	RAB	A (5)	0.36
52	Capitol Blvd/Tumwater Blvd	Signal	D (39)	1.03
53	65 th Ave/Henderson Blvd	Signal	A (8)	0.74
54	Tumwater Blvd/Henderson Blvd	Signal	D (43)	0.99
55	Trails End Dr/Henderson Blvd	TWSC	C (15)	0.27
56	Littlerock Rd/Black Hills School Drwy	Signal	A (3)	0.38
57	Center St/76 th Ave	TWSC	C (20)	0.24
58	Old Hwy 99/Henderson Blvd	Signal	B (15)	0.75
59	Old Hwy 99/79 th Ave	TWSC	F (79)	0.25
60	Kimmie St/83 rd Ave	TWSC	A (10)	0.09
61	Center St/83 rd Ave	TWSC	B (13)	0.41
62	Old Hwy 99/88 th Ave	Signal	B (12)	0.79
63	I-5 SB Ramps/93 rd Ave	Signal	C (22)	0.88
64	I-5 NB Ramps/93 rd Ave	TWSC	B (14)	0.35
65	Kimmie St/93 rd Ave	TWSC	C (25)	0.28
66	Case Rd/93 rd Ave	AWSC	E (43)	1.00
67	Tilley Rd (South)/93 rd Ave	AWSC	C (25)	0.84
68	Tilley Rd (North)/93 rd Ave	TWSC	C (18)	0.34
69	Old Hwy 99/93 rd Ave	TWSC	C (20)	0.45

1. Due to the unique nature of this intersection control, HCM cannot be used to calculate delay. Sim-Traffic simulation was used to calculate average delay.
2. HCM 2000 was used at this signal because the shared through-left lane is not accurately analyzed in HCM 2010.
3. This intersection is being graded based on the known congestion along Capitol Boulevard as a result of the signal.

Based on this analysis, the following intersections are projected to operate at an LOS E or worse by 2022:

- 6) Black Lake Boulevard at Black Lake Belmore
- 15) Boston Street at Custer Way
- 16) Deschutes Way at Boston St
- 18) Custer Way at Capitol Boulevard
- 19) Custer Way/North Street at Cleveland Avenue
- 25) 2nd Avenue at Linwood Avenue
- 27) Henderson Boulevard at Yelm Highway
- 49) I-5 NB Ramps at Tumwater Boulevard
- 59) Old Highway 99 at 79th Avenue
- 66) Case Road at 93rd Avenue

Each of these intersections has an improvement identified in the 2040 improvement package that will accommodate the 2022 traffic volumes.

4. PROJECT COST ESTIMATES

4.1 PLANNING LEVEL ROADWAY PROJECT COST ESTIMATES

Planning level cost estimates were developed using eight elements:

- Preparation
- Roadwork
- Construction Staging
- Right-of-Way
- Environmental
- Utilities
- Engineering
- Permitting

Preparation and Roadwork element estimates were developed by using WSDOT unit bid data and current comparable project bid data. This data was organized to estimate standard project items in basic units: linear feet, square feet and cubic feet. Projects were then measured in GIS and CAD software to estimate each item.

Construction Staging was estimated by using a percentage of the Roadwork estimation based on three different levels:

- Typical Construction (5%) – Typical construction using simple stages and efficient construction practices.
- Staging (20%) – Moderately complex construction that will require more complex staging to complete construction.
- Difficult/Inefficient (35%) – Difficult or inefficient construction that will require complex staging and atypical construction practices to complete.

The Right-of-Way element was estimated using data from Thurston County's Geodata GIS data base. Right-of-Way impact was measured to evaluate how many parcels could be affected by the project. Geodata was used to create an average cost per square foot of the affected parcels. This cost per square foot was combined with typical Right-of-Way acquisition fees to develop the total Right-of-Way cost estimate.

Environmental and Utilities elements were estimated using different levels of risk associated with a percentage of the Roadwork estimation: low (5%), medium (10%) and high (20%). This risk was calculated by viewing aerial images and assessing risk of environmental and utilities impact.

The Engineering element was estimated by using industry standards of 15% of construction costs for design and 10% of construction costs for construction engineering.

Permitting was estimated by assuming City specific projects would require 3% of construction costs. Projects involving WSDOT were estimated to require an additional 10% of construction costs for permitting.

A 30% conceptual contingency was included in each project estimate.

The planning level cost estimates for roadway projects is provided in **Table 7**.

4.2 PLANNING LEVEL INTERSECTION PROJECT COST ESTIMATES

Planning level intersection cost estimates were developed using WSDOT unit bid data and current comparable project construction cost data. Each intersection was evaluated using aerial images to determine size and type of intersection improvements. Based on the type of intersection improvements, potential Right-of-Way acquisition area was calculated. Potential Right-of-Way acquisition and size of intersection improvements were compared to recent intersection project construction cost information to develop intersection cost estimates.

The planning level cost estimates for intersections are provided in **Table 8**. A summary of the total Capital Improvements is provided in **Table 9**.

Table 7. Planning Level Cost Estimates – Roadway Projects

Project Number	Project	Total Cost
R-1	Littlerock Road	\$8,470,000
R-2	Tyee Drive ¹	\$4,800,000
R-3	Tyee Drive	\$7,000,000
R-4	Tyee Drive	\$6,770,000
R-5	Tyee Drive	\$9,220,000
R-6	Trosper Road	\$1,050,000
R-7	Tumwater Boulevard	\$6,540,000
R-8	Tumwater Boulevard	\$15,425,793
R-9	Tumwater Boulevard	\$2,370,000
R-10	E Street	\$37,790,000
R-11	Old Highway 99 ¹	\$610,000
R-12	Old Highway 99	\$20,270,000
R-13	Old Highway 99	\$10,090,000
R-14	Henderson Boulevard	\$3,970,000
R-15	Henderson Boulevard	\$8,840,000
R-16	32 nd Street ²	\$7,770,000
R-17	70 th Street ²	\$3,700,000
R-18	73 rd Street ²	\$9,640,000
R-19	Prine Drive ²	\$5,730,000
R-20	93 rd Avenue	\$2,140,000
R-21	93 rd Avenue	\$4,410,000
R-22	93 rd Avenue	\$9,770,000
R-23	93 rd Avenue	\$3,400,000
R-24	93 rd Avenue	\$10,810,000
R-25	6 th Avenue	\$5,800,000
R-26	Custer Way	\$290,000
R-27	Capitol Boulevard	\$1,030,000
R-28	Capitol Boulevard	\$1,030,000
R-29	Capitol Boulevard	\$3,340,000
R-30	New North/South Street	\$2,740,000
R-31	Odegard Road	\$3,610,000
R-32	Bishop Road	\$937,792
R-33	73 rd /66 th Connector ²	\$6,030,000
R-34	New Market Street	\$4,040,000
R-35	Town Center Connector	\$3,480,000
R-36	72 nd Avenue	\$5,360,000
R-37	Doelman Property ²	\$22,260,000
R-38	Trosper Road Interchange	\$5,650,000
R-39	Deschutes Way	\$2,850,000
TOTAL		\$269,033,585

1. Project is already funded

2. Projected expected to be developer funded

Table 8. Planning Level Cost Estimates – Intersection Projects

Project Number	Project	Total Cost
I-1	Black Lake Belmore/Black Lake Blvd	\$2,500,000
I-2	Capitol Blvd/Carlyon Ave	\$3,500,000
I-3	2 nd Ave/Custer Way	\$100,000
I-4	Boston St/Custer Way	\$4,000,000
I-5	Deschutes Way/Boston St	\$500,000
I-6	Capitol Blvd/Cleveland Ave	\$3,500,000
I-7	Capitol Blvd/Custer Way	\$3,500,000
I-8	Cleveland Ave/Custer Way/North St	\$4,500,000
I-9	Linwood Ave/2 nd Ave	\$2,500,000
I-10	Capitol Blvd/Linwood Ave	\$2,500,000
I-11	Henderson Blvd/Yelm Hwy	\$2,500,000
I-12	Troster Rd/Rural Rd	\$500,000
I-13	Troster Rd/2 nd Ave/Littlerock Rd	\$2,500,000
I-14	Troster Rd/Tyee Dr/SB I-5 Ramps	\$2,500,000
I-15	Troster Rd/Capitol Blvd	\$6,000,000
I-16	T St/Capitol Blvd	\$5,500,000
I-17	X St/Capitol Blvd	\$4,000,000
I-18	Dennis St/Capitol Blvd	\$3,000,000
I-19	Old Hwy 99/79 th Ave	\$2,000,000
I-20	93 rd Ave/I-5 NB Ramps	\$500,000
I-21	93 rd Ave/Kimmie St	\$500,000
I-22	93 rd Ave/Case Rd	\$2,500,000
I-23	93 rd Ave/Tilley Rd (south)	\$2,500,000
I-24	93 rd Ave/Tilley Rd (north)	\$2,500,000
I-25	93 rd Ave/Old Hwy 99	\$2,500,000
TOTAL		\$66,100,000

Table 9. Planning Level Cost Estimates – Cost Summary

Total Roadway Cost	\$269,033,585
Total Intersection Cost	\$66,100,000
Total Cost	\$335,133,585
Developer Funded/ Already Funded	-\$60,540,000
Potential Cost for City	\$274,593,585

APPENDIX A-1

TURNING MOVEMENT COUNTS



Prepared for: **SCJ Alliance**
Traffic Count Consultants, Inc.

Phone: (253) 926-6099 FAX: (253) 922-7211 E-Mail: Team@TCCinc.com

WB/DRE

Intersection: RV Johnson Blvd SW & Matman Rd SW

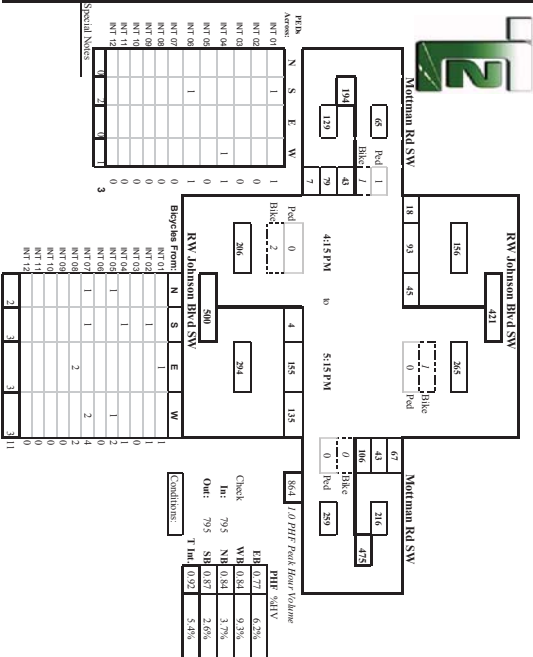
Location: Tumwater, Washington

Date of Count: Tues 6/30/2015

Checked By: Jess

Time Interval	From North on (SB)	From South on (NB)	From East on (WB)	From West on (EB)	Interval Total
4:15 P	1	1	1	1	4
4:30 P	2	17	23	5	31
4:45 P	1	8	19	2	30
5:00 P	0	9	23	5	37
5:15 P	1	11	25	6	43
5:30 P	0	9	15	3	27
5:45 P	1	9	24	4	38
6:00 P	2	4	26	2	34
6:15 P	0	0	0	0	0
6:30 P	0	0	0	0	0
6:45 P	0	0	0	0	0
7:00 P	0	0	0	0	0

Survey	11	74	180	36	22	6	286	238	42	190	73	135	13	77	108	10	1423
Total	11	74	180	36	22	6	286	238	42	190	73	135	13	77	108	10	1423
Approach	4	45	93	18	11	4	153	153	20	106	43	67	8	43	79	7	795
%DIV																	79%
PIF																	0.84



Prepared for: **SCJ Alliance**
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WB/DRE

Intersection: Crosby Blvd SW & Matman Rd SW

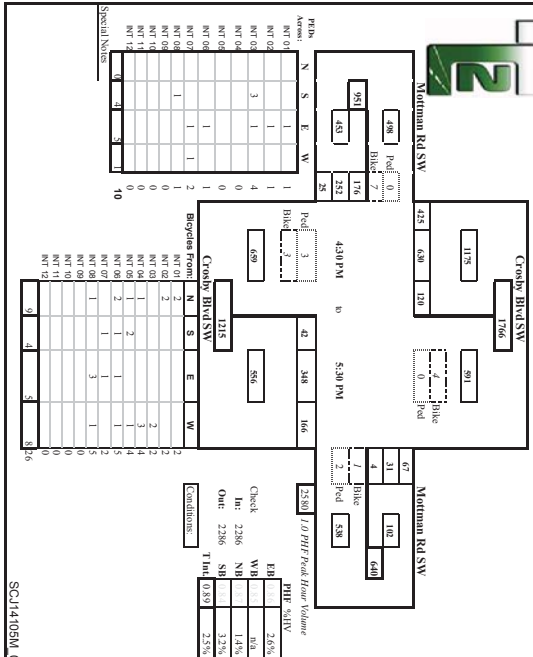
Location: Tumwater, Washington

Date of Count: Wed 10/08/2014

Checked By: Jess

Time Interval	From North on (SB)	From South on (NB)	From East on (WB)	From West on (EB)	Interval Total
4:15 P	10	23	131	90	254
4:30 P	11	30	123	90	254
4:45 P	16	21	133	86	256
5:00 P	10	28	143	82	263
5:15 P	7	37	169	125	338
5:30 P	5	34	185	112	336
5:45 P	5	30	152	71	258
6:00 P	7	21	128	84	230
6:15 P	0	0	0	0	0
6:30 P	0	0	0	0	0
6:45 P	0	0	0	0	0
7:00 P	0	0	0	0	0

	Peak Hour 4:30 PM to 5:30 PM																
Survey	71	224	1164	760	17	81	667	307	2	10	46	142	22	292	488	49	4230
Total	38	120	610	425	8	42	348	166	0	4	31	67	12	176	322	25	2286
Approach			1175				556				102			453			2286
%DIV			3.2%				14.5%				5.9			2.4%			2.2%
PIF																	0.89



SCJ14105M_01p



Prepared for: **SCJ Alliance**
Traffic Count Consultants, Inc.

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WB@DRE

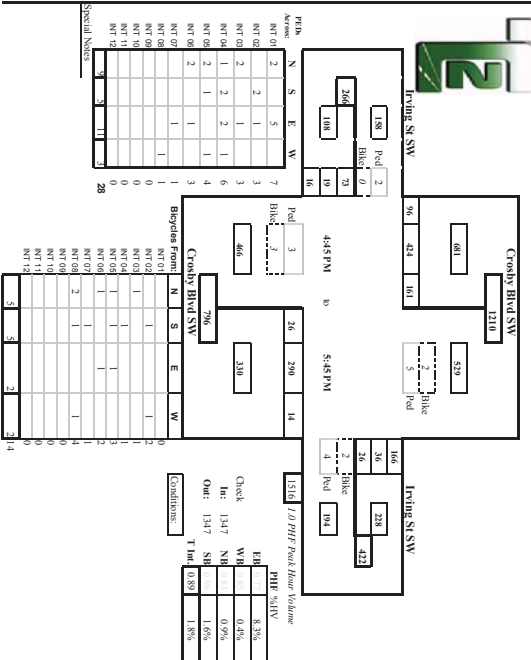
Intersection: Crosby Blvd SW & Irving St SW
Location: Tumwater, Washington

Date of Count: Wed 10/08/2014
Checked By: Jess

Time	From North on (SB)				From South on (NB)				From East on (WB)				From West on (EB)				Interval
Interval	County Blvd SW				County Blvd SW				Irish St SW				Irish St SW				
4:15 P	1	43	88	13	2	1	60	3	1	3	3	44	1	32	8	2	300
4:30 P	2	34	80	8	1	1	62	2	0	3	2	43	3	21	1	1	258
4:45 P	2	35	64	15	1	2	62	3	0	4	2	45	0	19	3	2	266
5:00 P	3	43	82	23	1	3	54	2	0	9	8	35	4	23	5	3	290
5:15 P	3	46	109	23	0	7	84	8	0	6	12	49	0	24	8	3	379
5:30 P	2	54	113	30	1	13	79	3	1	3	12	44	3	16	2	3	352
5:45 P	3	38	120	20	1	3	73	1	0	8	4	38	2	10	4	7	326
6:00 P	1	36	78	19	1	4	65	4	0	2	4	34	3	14	0	6	266
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Total	19	309	764	151	8	34	539	26	2	38	47	312	16	159	31	27	2457	
Survey	19	309	764	151	8	34	539	26	2	38	47	312	16	159	31	27	2457	
Peak Hour: 4:45 PM	10	5:45 PM																

Total	11	161	424	96	3	26	290	14	1	26	36	164	9	73	19	16	1347	
Approach	681					330				228		108					1347	
%IV	1.8%					0.9%				0.6%		8.3%					9.8%	
PIF	0.03					0.03				0.03		0.77					0.80	



Prepared for: **SCJ Alliance**
Traffic Count Consultants, Inc.

Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Tammy@TCCinc.com
WB@DRE

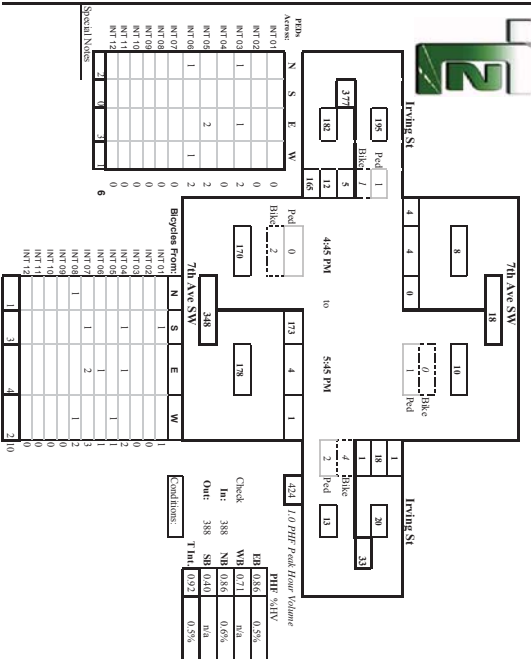
Intersection: 7th Ave SW & Irving St
Location: Tumwater, Washington

Date of Count: Tues 6/30/2015
Checked By: Jess

Time	From North on (SB)					From South on (NB)					From East on (WB)					From West on (EB)					Interval Total
	Interval	1	2	3	4	Interval	1	2	3	4	Interval	1	2	3	4	Interval	1	2	3	4	
7th Ave SW																					
Redden	0	0	0	0	0	1	40	1	1	0	0	1	0	0	0	1	6	36	86	56	
4:15 P	0	0	0	0	0	0	46	0	0	0	0	1	9	1	0	0	6	39	102	102	
4:30 P	0	0	0	0	0	0	46	0	0	0	1	0	3	1	1	1	5	29	86	86	
4:45 P	0	0	0	0	0	1	46	0	0	0	1	0	3	1	1	1	5	29	86	86	
5:00 P	0	0	0	0	0	0	50	1	1	0	1	0	1	5	1	1	0	5	39	103	
5:15 P	0	0	0	0	0	2	55	0	0	0	0	0	2	0	0	0	1	3	49	92	
5:30 P	0	0	0	0	0	1	47	1	0	0	0	0	5	0	0	0	1	2	45	106	
5:45 P	0	0	0	0	0	1	41	2	0	0	0	0	6	0	0	0	3	2	32	87	
6:00 P	0	0	0	2	2	0	49	1	1	0	0	0	6	1	1	1	4	30	97	97	
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Total	0	0	6	7	2	354	6	3	1	2	37	4	3	8	31	299	759	
Survey	0	0	6	7	2	354	6	3	1	2	37	4	3	8	31	299	759	
Peak Hour: 4:45 PM	10	5:45 PM																

Total	0	4	4	1	173	4	1	0	1	18	1	1	5	12	165	388	
Approach	8				178					20				183		388	
%IV	na				0.8%					0.5%				0.5%		0.5%	
PIF	0.40				0.86					0.71				0.86		0.92	





Prepared for: **SCJ Alliance**
Traffic Count Consultants, Inc.

Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TCCinc.com

WB/DRE

Intersection: Crosby Blvd SW & Barnes Blvd SW

Location: Tammeter, Washington

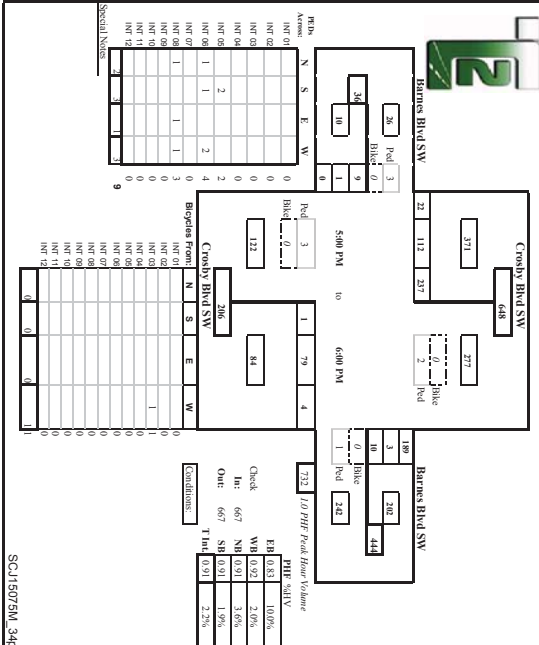
Date of Count: Tues 6/30/2015

Checked By: Jess

Time Interval	From North on (SB) Crosby Blvd SW	From South on (NB) Crosby Blvd SW	From East on (WB) Barnes Blvd SW	From West on (EB) Barnes Blvd SW	Interval Total
4:15 P	0	0	0	0	0
4:30 P	0	0	0	0	0
4:45 P	0	0	0	0	0
5:00 P	0	0	0	0	0
5:15 P	0	0	0	0	0
5:30 P	0	0	0	0	0
5:45 P	0	0	0	0	0
6:00 P	0	0	0	0	0
6:15 P	0	0	0	0	0
6:30 P	0	0	0	0	0
6:45 P	0	0	0	0	0
7:00 P	0	0	0	0	0

Total	12	424	214	36	3	1	152	10	10	17	4	329	2	15	1	1	1294
Survey	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Total	7	237	112	22	3	1	79	4	4	10	3	189	1	9	1	0	667
Approach	1.98	371	112	22	3	1	79	4	4	10	3	189	1	9	1	0	667
%TIV	1.98	371	112	22	3	1	79	4	4	10	3	189	1	9	1	0	667
PIF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91



Prepared for: **SCJ Alliance**
Traffic Count Consultants, Inc.

Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TCCinc.com

WB/DRE

Intersection: Black Lake Rd SW & Black Lake Blvd SW

Location: Tammeter, Washington

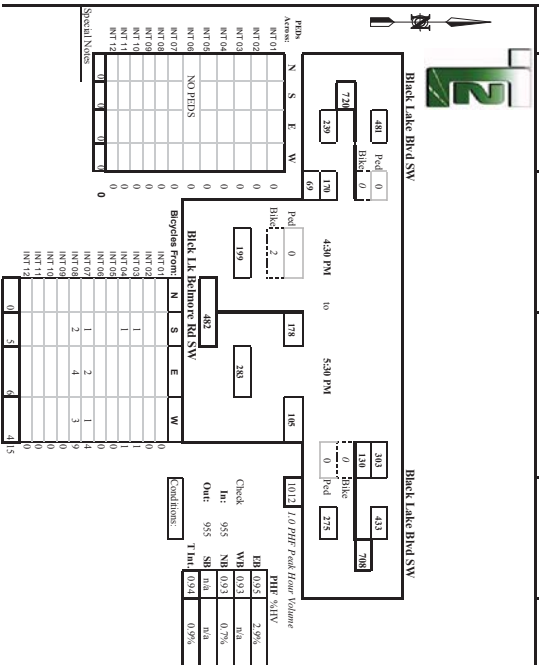
Date of Count: Tues 6/30/2015

Checked By: Jess

Time Interval	From North on (SB) Black Lake Rd SW	From South on (NB) Black Lake Rd SW	From East on (WB) Black Lake Blvd SW	From West on (EB) Black Lake Blvd SW	Interval Total
4:15 P	0	0	0	0	0
4:30 P	0	0	0	0	0
4:45 P	0	0	0	0	0
5:00 P	0	0	0	0	0
5:15 P	0	0	0	0	0
5:30 P	0	0	0	0	0
5:45 P	0	0	0	0	0
6:00 P	0	0	0	0	0
6:15 P	0	0	0	0	0
6:30 P	0	0	0	0	0
6:45 P	0	0	0	0	0
7:00 P	0	0	0	0	0

Total	0	0	0	0	0	3	324	0	191	6	241	608	0	9	0	343	1854
Survey	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Total	0	0	0	0	0	2	178	0	105	0	130	303	0	7	0	170	695
Approach	0	0	0	0	0	2	178	0	105	0	130	303	0	7	0	170	695
%TIV	0	0	0	0	0	2	178	0	105	0	130	303	0	7	0	170	695
PIF	0	0	0	0	0	0.93	0.93	0	0.93	0	0.93	0.93	0	0.93	0	0.93	0.93





Prepared for: **SCJ Alliance**
Traffic Count Consultants, Inc.

Phone: (253) 926-6099 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBEDIRE

Intersection: RV Johnson Blvd SW Bush Mountain Dr SW & Sapp Rd SW

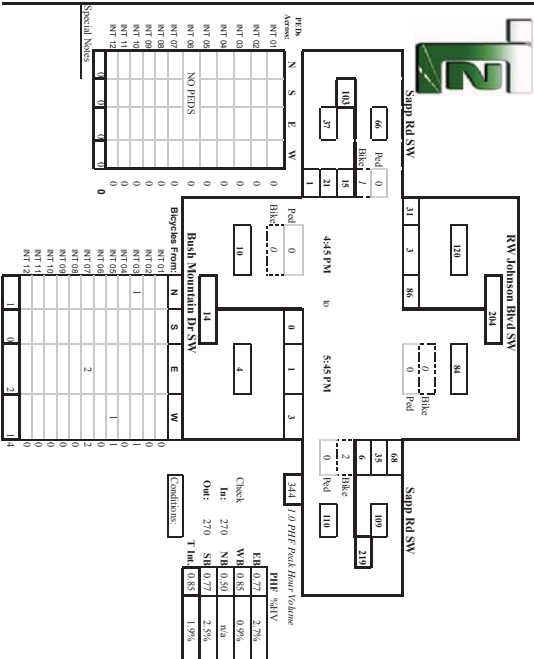
Location: Tumwater, Washington

Date of Count: Tues 6/30/2015

Checked By: Jess

Time Interval	From North on (SB)				From South on (NB)				From East on (WB)				From West on (EB)				Interval Total
	RW Bushway to BSAV				Bush Mountain to SW				Sage Rd to SW				Sage Rd to				
Leading	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	T	
4:15P	1	24	2	14	0	0	0	2	0	0	0	18	0	3	14	0	86
4:30P	0	14	2	7	0	0	1	0	1	7	10	0	4	6	0	52	
4:45P	1	16	0	8	0	0	0	0	0	5	12	0	6	5	0	52	
5:00P	0	19	1	7	0	0	0	1	1	5	16	1	2	4	0	55	
5:15P	1	28	1	10	0	0	1	1	0	2	9	15	0	3	8	1	79
5:30P	1	13	0	8	0	0	0	0	0	2	10	17	0	5	5	0	60
5:45P	1	26	1	6	0	0	0	2	0	1	11	20	0	5	4	0	76
6:00P	0	15	1	5	0	0	1	1	0	2	13	6	0	6	0	2	52
6:15P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Total	5	155	8	65	0	0	3	6	2	9	69	114	1	34	46	3	512
Survey																	
Peak Hour: 4:45 PM																	
Total	3	86	3	31	0	0	1	3	1	6	35	68	1	15	21	1	270
Approach		130									109						37
SAIV		2.9%									0.9%						1.9%
PIF		0.77									0.50						0.77
Conditions:																	0.85



Prepared for: **SCJ Alliance**
Traffic Count Consultants, Inc.

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WBEDIRE

Intersection: Sapp Rd SW & Crosby Blvd SW

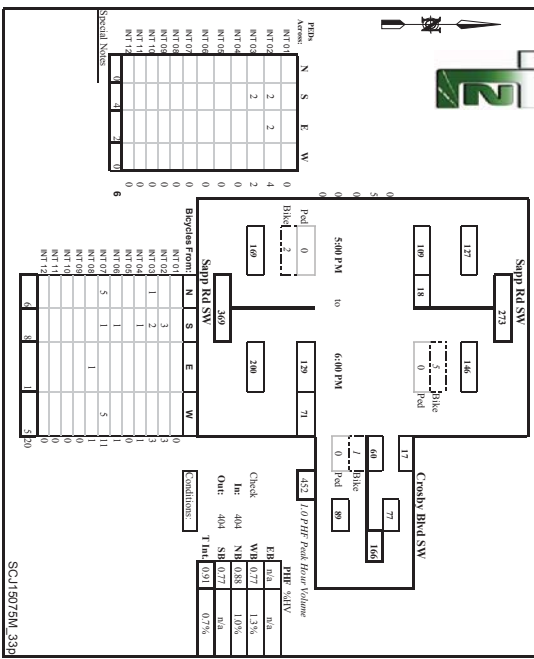
Location: Tumwater, Washington

Date of Count: Tues 6/30/2015

Checked By: Jess

Time	From North on (SB)				From South on (NB)				From East on (WB)				From West on (EB)				Interval
	Int'l	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	1	6	44	0	0	0	0	34	13	1	14	0	2	0	0	0	113
4:30 P	0	2	24	0	2	0	30	23	0	16	0	4	0	0	0	0	99
4:45 P	0	2	29	0	0	0	0	24	15	0	10	0	3	0	0	0	83
5:00 P	0	0	22	0	1	0	28	12	1	22	0	2	0	0	0	0	86
5:15 P	0	4	37	0	2	0	32	13	0	20	0	5	0	0	0	0	111
5:30 P	0	6	24	0	0	0	36	21	0	17	0	3	0	0	0	0	107
5:45 P	0	4	27	0	0	0	30	25	1	11	0	4	0	0	0	0	99
6:00 P	0	4	21	0	0	0	31	14	0	12	0	5	0	0	0	0	87
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Total	1	28	238	0	5	0	245	134	3	122	0	28	0	0	0	0	785
Survey																	
Peak Hour: 5:00 PM																	
Total	0	18	109	0	2	0	129	71	1	60	0	17	0	0	0	0	404
Approach			127				200			77							404
SAIV			na				1.0%			1.3%							6.3%
PIF			0.77				0.88			0.77							0.91
Conditions:																	





Prepared for: **SCJ Alliance**
Traffic Count Consultants, Inc.

Phone: (253) 926-6099 FAX: (253) 923-7211 E-Mail: Team@TC2inc.com

WB/D/BE

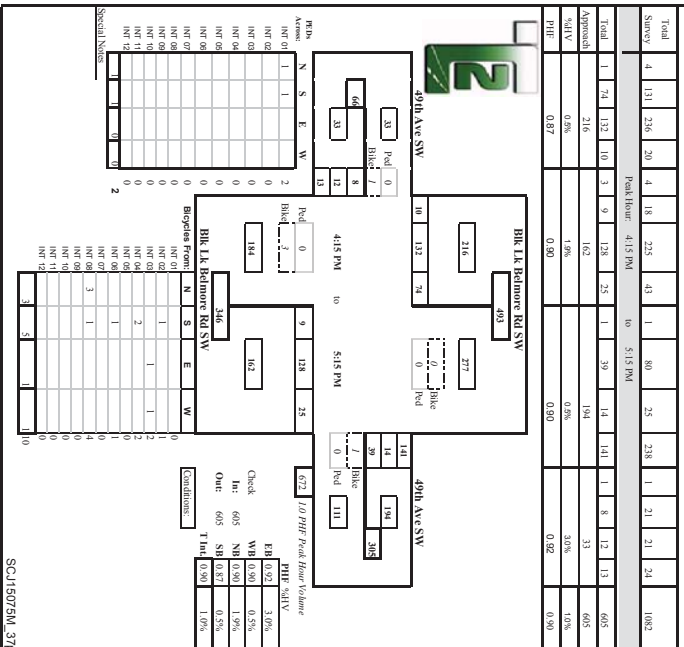
Intersection: Black Lake Baltimore Rd SW & 49th Ave SW

Date of Count: Tues 6/30/2015

Location: Tumwater, Washington

Checked By: Jess

Time	From North on (SB)	From South on (NB)	From East on (WB)	From West on (EB)	Interval
Interval	Black Lake Baltimore Rd SW	Black Lake Baltimore Rd SW	49th Ave SW	49th Ave SW	Total
4:15 P	1	2	1	1	116
4:30 P	1	2	1	1	153
4:45 P	0	2	1	1	168
5:00 P	0	2	1	1	144
5:15 P	0	2	1	1	140
5:30 P	1	2	1	1	147
5:45 P	0	2	1	1	113
6:00 P	0	2	1	1	101
6:15 P	0	2	1	1	90
6:30 P	0	2	1	1	90
6:45 P	0	2	1	1	90
7:00 P	0	2	1	1	90
Total	4	18	43	25	1082
Survey	4	131	236	20	418
Peak Hour: 4:15 PM to 5:15 PM	1	10	3	1	15
Approach	1	74	132	10	162
SAIV	0.98	1.06	1.04	1.01	0.99
PHF	0.87	0.80	0.80	0.80	0.80



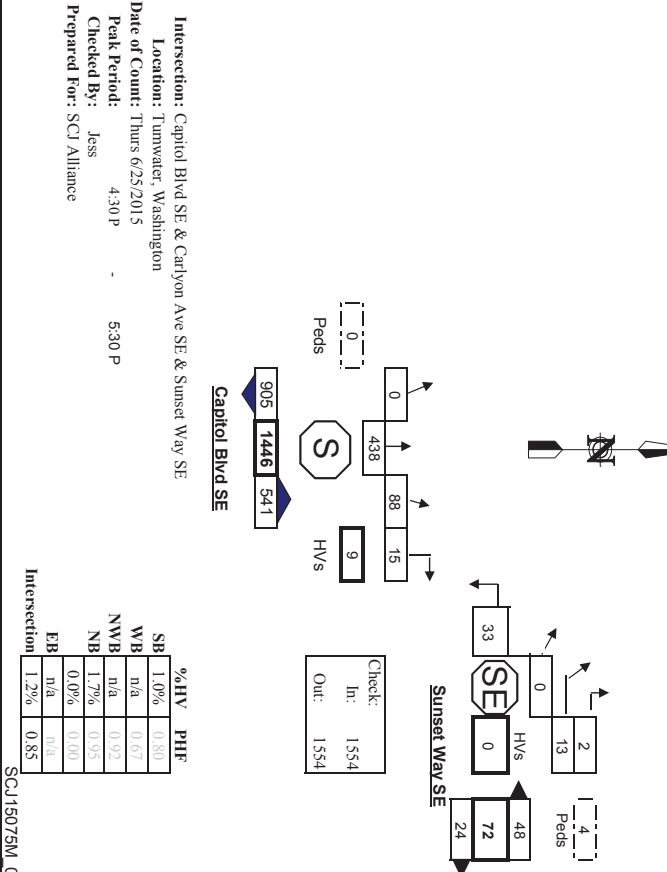
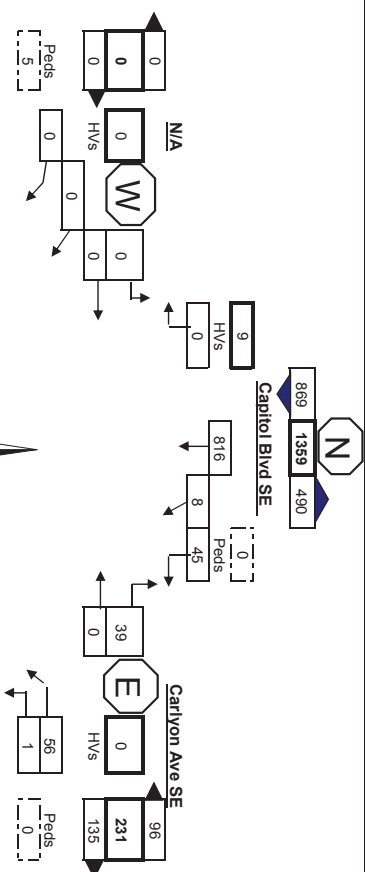
Traffic Count Consultants, Inc.

DBE/WBE

DBE/WBE

Phone: (425) 253 926-6099

E-Mail: Team@TC2inc.com





Prepared for: **SCJ Alliance**
Traffic Count Consultants, Inc.

Phone: (253) 926-6099 FAX: (253) 922-7211 E-Mail: Team@TCCinc.com

WB/DRE

Intersection: Deschutes Way SW & I-5 NB On Ramp

Location: Tumwater, Washington

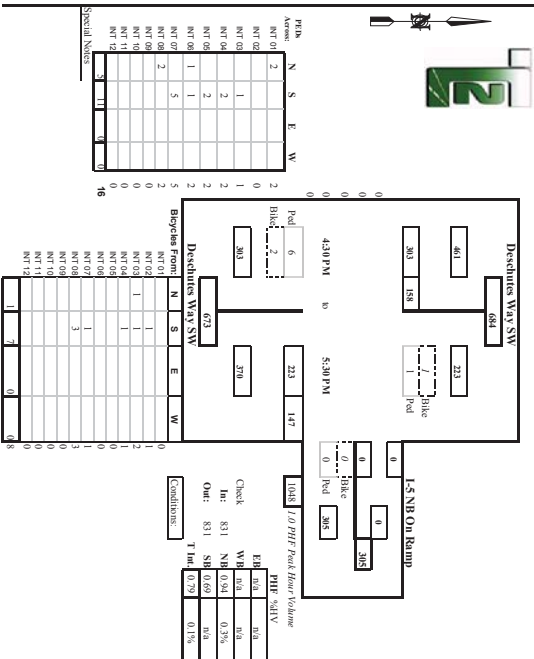
Date of Count: Wed 7/01/2015

Checked By: Jess

Time Interval	From North on (SB)			From South on (NB)			From East on (WB)			From West on (EB)			Interval Total
	L	S	R	L	S	R	L	S	R	L	S	R	
Leading & Lagging	1	0	0	1	0	0	0	0	0	0	0	0	0
4:15 P	0	36	49	0	1	0	37	51	0	0	0	0	175
4:30 P	0	25	53	0	2	0	36	30	0	0	0	0	144
4:45 P	0	33	71	0	0	0	54	38	0	0	0	0	193
5:00 P	0	27	48	0	0	0	47	38	0	0	0	0	160
5:15 P	0	64	103	0	0	0	56	39	0	0	0	0	262
5:30 P	0	35	81	0	1	0	66	32	0	0	0	0	214
5:45 P	0	34	51	0	0	0	64	33	0	0	0	0	183
6:00 P	0	24	45	0	1	0	43	49	0	0	0	0	161
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0

Total	0	279	501	0	5	0	403	310	0	0	0	0	1903
Survey	0	279	501	0	5	0	403	310	0	0	0	0	1903

Peak Hour: 4:30 PM to 5:30 PM													
Total	0	158	303	0	1	0	223	147	0	0	0	0	831
Approach	461												
%RTV	na												
PIF	0.69												



Prepared for: **SCJ Alliance**
Traffic Count Consultants, Inc.

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WB/DRE

Intersection: Deschutes Way SW & US 101 WB On Ramp

Location: Tumwater, Washington

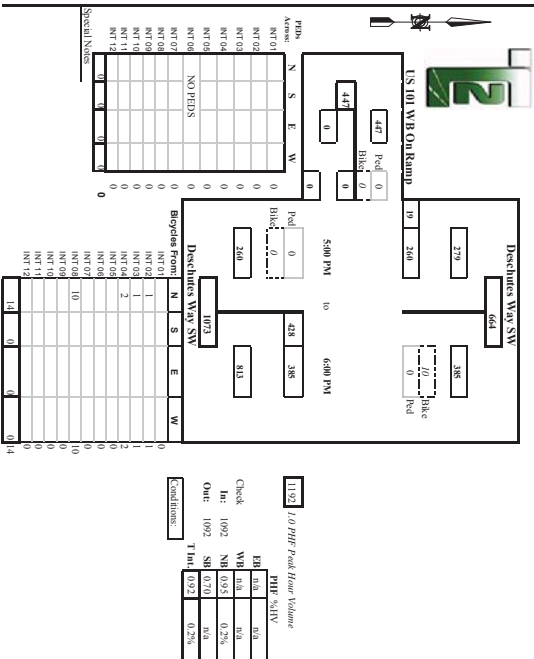
Date of Count: Wed 7/01/2015

Checked By: Jess

Time Interval	From North on (SB)			From South on (NB)			From East on (WB)			From West on (EB)			Interval Total
	L	S	R	L	S	R	L	S	R	L	S	R	
Leading & Lagging	1	0	0	1	0	0	0	0	0	0	0	0	0
4:15 P	0	0	46	2	3	95	87	0	0	0	0	0	299
4:30 P	0	0	47	0	2	88	67	0	0	0	0	0	202
4:45 P	0	0	72	2	0	93	89	0	0	0	0	0	256
5:00 P	0	0	47	1	4	113	81	0	0	0	0	0	245
5:15 P	0	0	92	7	0	101	98	0	0	0	0	0	299
5:30 P	0	0	76	5	1	105	96	0	0	0	0	0	282
5:45 P	0	0	49	3	0	116	97	0	0	0	0	0	265
6:00 P	0	0	43	4	1	106	94	0	0	0	0	0	247
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0

Total	1	0	471	27	8	817	709	0	0	0	0	0	2024
Survey	1	0	471	27	8	817	709	0	0	0	0	0	2024

Peak Hour: 5:00 PM to 6:00 PM													
Total	0	0	260	19	2	428	385	0	0	0	0	0	1092
Approach	279												
%RTV	na												
PIF	0.70												





Prepared for: **SCJ Alliance**
Traffic Count Consultants, Inc.

Phone: (253) 924-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBEDRE

Intersection: I-5 SB/US 101 EB Off Ramps, 2nd Ave SW & Desoto St SW

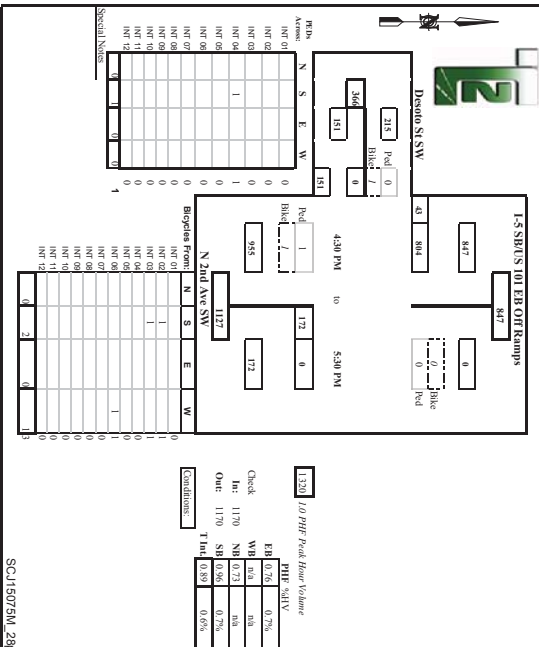
Location: Tumwater, Washington

Date of Count: Tues 6/30/2015

Checked By: Jess

Time Interval	From North on (SB)				From South on (NB)				From East on (WB)				From West on (EB)				Interval Total
	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	1	0	195	3	0	33	0	0	0	0	0	0	0	0	0	0	285
4:30 P	1	0	200	3	0	26	0	0	0	0	0	0	0	0	0	0	268
4:45 P	0	0	197	3	0	42	0	0	0	0	0	1	0	0	0	31	278
5:00 P	1	0	195	15	0	38	0	0	0	0	0	0	0	0	0	33	281
5:15 P	1	0	198	13	0	33	0	0	0	0	0	0	0	0	0	32	281
5:30 P	4	0	214	7	0	59	0	0	0	0	0	0	0	0	0	30	320
5:45 P	1	0	202	11	0	56	0	0	0	0	0	0	0	0	0	18	267
6:00 P	0	0	199	3	0	41	0	0	0	0	0	1	0	0	0	28	277
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	9	0	1600	31	0	308	0	0	0	0	0	2	0	0	0	258	2247
Survey																	

Peak Hour: 4:30 PM to 5:30 PM																	Interval Total
Total	6	0	804	43	0	172	0	0	0	0	0	1	0	0	0	151	1170
Approach																	
SAHV			0.7%													151	1170
PHV			0.9%													151	1170



Prepared for: **TENW**
Traffic Count Consultants, Inc.

Phone: (253) 924-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBEDRE

Intersection: N 2nd Ave SW & Claster Way SW

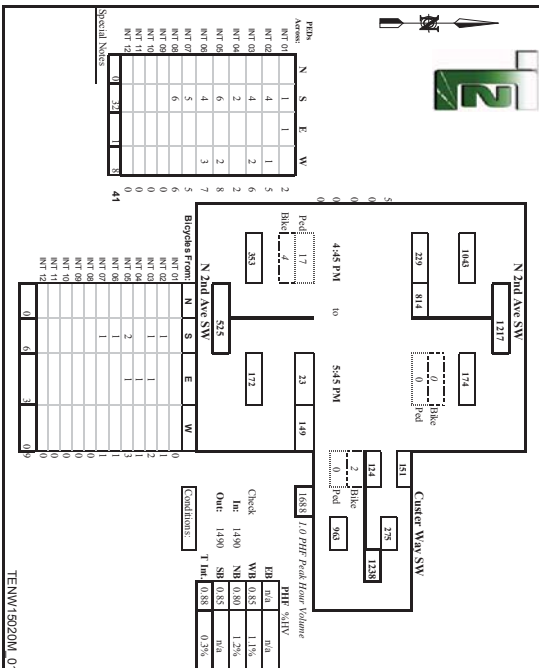
Location: Tumwater, Washington

Date of Count: Tues 2/10/2015

Checked By: Jess

Time Interval	From North on (SB)				From South on (NB)				From East on (WB)				From West on (EB)				Interval Total
	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	1	215	47	0	0	0	4	36	0	18	0	32	0	0	0	0	352
4:30 P	3	199	68	0	1	0	6	35	1	21	0	30	0	0	0	0	349
4:45 P	0	186	45	0	0	0	0	5	27	0	31	0	27	0	0	0	321
5:00 P	0	190	51	0	0	0	0	5	35	1	28	0	38	0	0	0	357
5:15 P	0	186	55	0	1	0	5	40	1	27	0	40	0	0	0	0	362
5:30 P	0	240	65	0	1	0	5	31	1	42	0	39	0	0	0	0	422
5:45 P	0	188	58	0	0	0	8	34	0	27	0	34	0	0	0	0	349
6:00 P	0	160	50	0	0	0	2	40	1	22	0	32	0	0	0	0	306
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	4	1574	439	0	3	0	40	277	5	216	0	272	0	0	0	0	2818
Survey																	

Peak Hour: 4:45 PM to 5:45 PM																
Total	0	814	229	0	2	0	23	149	3	124	0	151	0	0	0	1490
Approach																
SAHV			1.0%													1490
PHV			0.8%													1490
PIE			0.50													0.84
Source																
4	1574	419	0	3	0	40	277	5	216	0	272	0	0	0	0	2818





Prepared for: **SCJ Alliance**
Traffic Count Consultants, Inc.
Phone: (253) 926-0099 F.A.X: (253) 922-7211 E-Mail: Team@TC2inc.com
WEB: DRIE

Intersection: Boston St SW & Carter Way SW

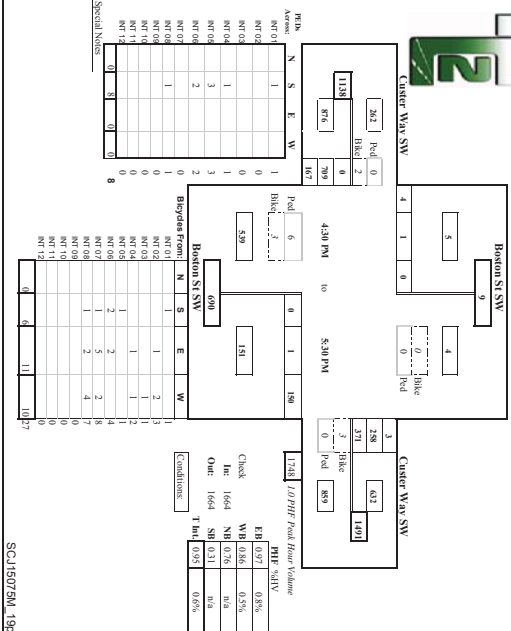
Date of Count: Thurs 02/25/2015

Location: Turnward, Washington

Checked By: Jess

Time	From North on (SB)	From South on (NB)	From East on (WB)	From West on (EB)	Interval
Interval	Boston St SW	Boston St SW	Carter Way SW	Carter Way SW	Total
4:15 P	1	1	1	1	4
4:30 P	0	0	0	0	0
4:45 P	0	0	0	0	0
5:00 P	0	0	0	0	0
5:15 P	0	0	0	0	0
5:30 P	0	0	0	0	0
5:45 P	0	0	0	0	0
6:00 P	0	0	0	0	0
6:15 P	0	0	0	0	0
6:30 P	0	0	0	0	0
6:45 P	0	0	0	0	0
7:00 P	0	0	0	0	0
Total	0	0	0	0	0
Survey	0	0	0	0	0

Peak Hour: 4:30 PM to 5:30 PM														
	Total			SAIV			PRF							
Total	0	0	0	1	150	3	371	258	3	7	0	709	167	1664
Approach	5			151			632			7		875		1664
SAIV	0.31			0.78			0.86			0.95		0.97		0.95
PRF	0.31			0.78			0.86			0.95		0.97		0.95



Prepared for: **SCJ Alliance**
Traffic Count Consultants, Inc.
Phone: (253) 926-0099 F.A.X: (253) 922-7211 E-Mail: Team@TC2inc.com
WEB: DRIE

Intersection: Deschutes Way SW & Boston St SW

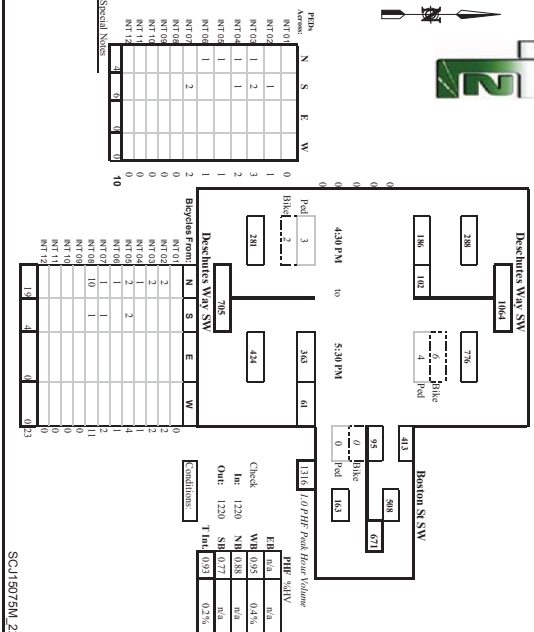
Date of Count: Wed 7/01/2015

Location: Turnward, Washington

Checked By: Jess

Time	From North on (SB)	From South on (NB)	From East on (WB)	From West on (EB)	Interval
Interval	Deschutes Way SW	Deschutes Way SW	Boston St SW	Boston St SW	Total
4:15 P	1	1	1	1	4
4:30 P	0	0	0	0	0
4:45 P	0	0	0	0	0
5:00 P	0	0	0	0	0
5:15 P	0	0	0	0	0
5:30 P	0	0	0	0	0
5:45 P	0	0	0	0	0
6:00 P	0	0	0	0	0
6:15 P	0	0	0	0	0
6:30 P	0	0	0	0	0
6:45 P	0	0	0	0	0
7:00 P	0	0	0	0	0
Total	1	1	1	1	4
Survey	1	1	1	1	4

Peak Hour: 4:30 PM to 5:30 PM																
	Total	1	1:57	3:15	0	4	0	4	174	0	822	0	0	0	0	2276
Survey																
Total	0	102	186	0	0	0	0	4	61	2	95	0	414	0	0	1220
Approach		288						424			508				0	1230
SAIV		na						na			0.95				0.95	
PRF		0.77						0.88			0.95				0.93	





Prepared for: **SCJ Alliance**
Traffic Count Consultants, Inc.

Phone: (253) 926-6009 FAX: (253) 922-2711 E-Mail: Team@TC2inc.com

WB/DRE

Intersection: Cleveland Ave SE & Capitol Blvd SE

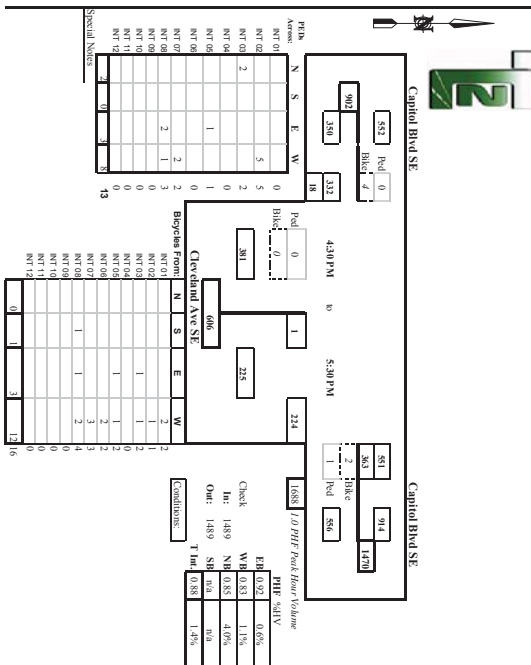
Location: Tumwater, Washington

Date of Count: Thurs 6/25/2015

Checked By: Jess

Time	From North on SB				From South on NB				From East on WB				From West on EB				Interval
Interval	L	T	S	R	L	T	S	R	L	T	S	R	L	T	S	R	Total
Leading @	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 P	0	0	0	0	4	0	0	0	51	3	66	42	0	2	0	70	8
4:30 P	0	0	0	0	3	0	0	0	51	2	57	96	0	1	0	69	7
4:45 P	0	0	0	0	3	0	0	0	66	5	89	116	0	1	0	78	7
5:00 P	0	0	0	0	2	0	0	0	51	1	64	110	0	0	0	72	4
5:15 P	0	0	0	0	1	0	0	0	52	2	100	165	0	1	0	89	5
5:30 P	0	0	0	0	3	1	0	0	55	2	100	160	0	0	0	92	2
5:45 P	0	0	0	0	1	0	0	0	44	3	64	100	0	1	0	61	8
6:00 P	0	0	0	0	3	0	0	0	53	1	53	75	0	0	0	72	4
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	20	1	0	423	19	603	904	0	6	0	604	45	2580
Shovels	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Peak Hour: 4:30 PM	to 5:30 PM	Peak Hour: 4:30 PM	to 5:30 PM
Total	0	0	0
Approach	0	0	0
SAIV	na	225	914
PIF	n/a	4.2%	1.1%
		0.85	0.83
			0.92
			0.88

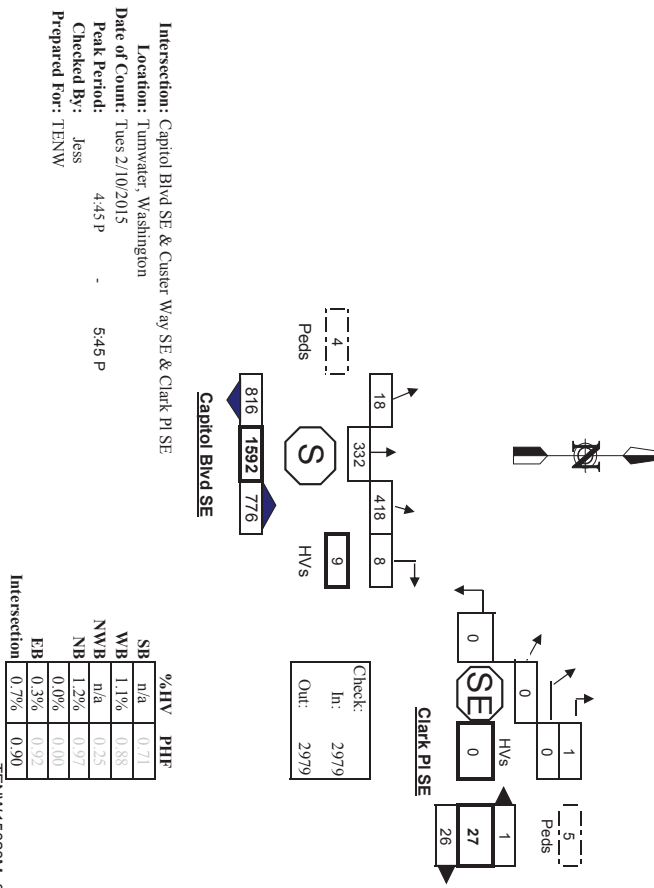
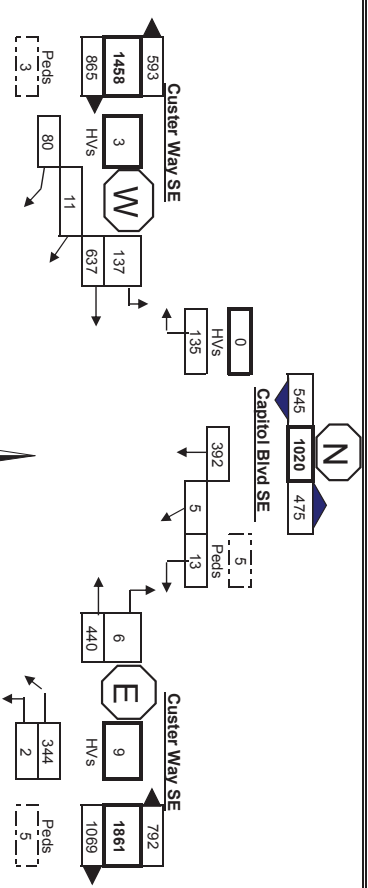


Traffic Count Consultants, Inc.

Phone: (425) 253 926-6009 E-Mail: Team@TC2inc.com

DBE/WBE

DBE/WBE





Prepared for: **TENW**
Traffic Count Consultants, Inc.

Phone: (253) 926-6099 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WB@DRE

Intersection: Cleveland Ave SE & North St SE/Carter Way SE

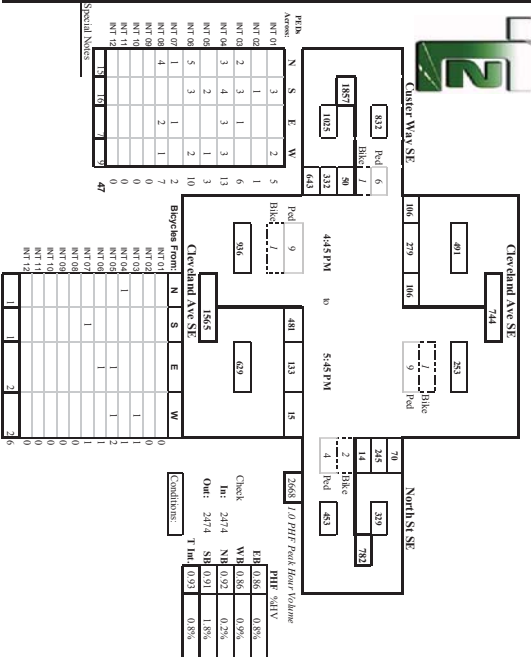
Date of Count: Tues 2/10/2015

Location: Tumwater, Washington

Checked By: Jess

Time	From North on (SB)				From South on (NB)				From East on (WB)				From West on (EB)				Interval
	Leading	L	S	R	L	S	R	L	S	R	L	S	R	L	S	R	Total
4:15 P	1	11	44	23	0	117	26	4	2	2	64	19	3	14	83	134	524
4:30 P	4	39	56	29	1	131	26	2	0	5	38	20	1	14	73	147	571
4:45 P	3	26	54	20	0	132	27	2	2	3	32	12	3	23	78	135	564
5:00 P	2	22	59	22	1	123	41	7	0	6	49	15	1	12	57	115	554
5:15 P	2	25	80	30	0	112	26	2	2	5	60	20	3	6	86	162	614
5:30 P	3	28	79	18	0	130	54	3	0	2	62	13	1	17	99	182	667
5:45 P	2	31	63	31	0	116	32	3	1	1	73	22	3	15	90	164	639
6:00 P	3	15	54	29	0	115	33	1	0	4	57	18	2	14	79	131	550
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	20	150	487	207	2	976	244	24	7	28	456	139	17	115	645	1190	4701
Survey	Peak Hour: 4:45 PM to 5:45 PM																

Total	9	106	279	106	1	481	133	15	3	14	245	70	8	50	353	643	2474
Approach	491																
%RTV	1.8%																
PIF	0.91																
Conditions	0.92																
PIF	0.86																
Conditions	0.91																



Prepared for: **SCJ Alliance**
Traffic Count Consultants, Inc.

Phone: (253) 926-6099 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WB@DRE

Intersection: Hoody St SE & North St SE

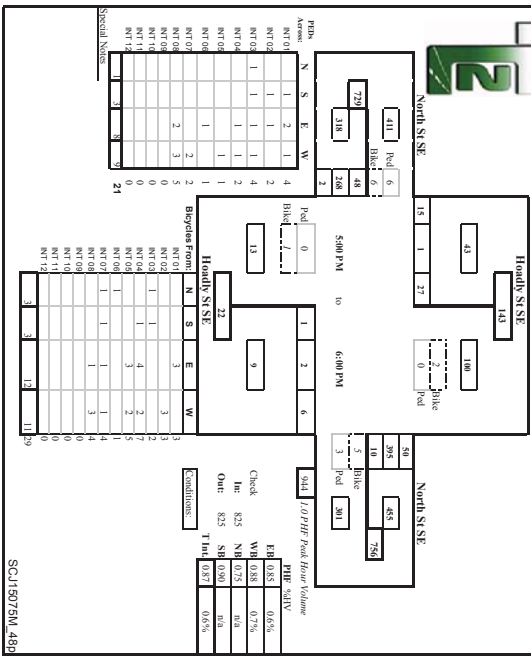
Date of Count: Thurs 6/25/2015

Location: Tumwater, Washington

Checked By: Jess

Time	From North on (SB)				From South on (NB)				From East on (WB)				From West on (EB)				Interval
	Leading	L	S	R	L	S	R	L	S	R	L	S	R	L	S	R	Total
4:15 P	0	9	0	5	0	1	0	0	1	2	73	9	3	7	51	1	158
4:30 P	0	8	1	3	0	0	0	1	2	2	68	10	1	1	51	0	145
4:45 P	0	9	0	3	0	1	2	1	2	0	100	12	2	4	48	0	180
5:00 P	1	7	2	5	0	0	0	0	1	1	103	11	1	2	52	4	187
5:15 P	0	8	1	1	0	1	0	1	1	1	106	13	1	5	70	0	207
5:30 P	0	6	0	2	0	0	0	2	1	0	92	12	0	5	75	1	197
5:45 P	0	5	0	2	0	0	0	2	0	3	86	15	1	8	60	1	185
6:00 P	0	8	0	3	0	0	2	1	1	6	111	12	0	30	45	0	226
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	60	4	31	0	3	4	8	9	15	739	92	9	62	470	7	1495
Survey	Peak Hour: 5:00 PM to 6:00 PM																

Total	0	27	1	15	0	1	2	6	3	10	395	50	2	48	268	2	825
Approach	43																
%RTV	0%																
PIF	0.90																
Conditions	0.75																
PIF	0.88																
Conditions	0.87																





Prepared for: **SCJ Alliance**
Traffic Count Consultants, Inc.

Phone: (253) 926-6099 FAX: (253) 922-7211 E-Mail: Team@TCCinc.com

WB:DBE

Intersection: Deshutes Way SW 1.5 NB Off Ramp & E SWSV

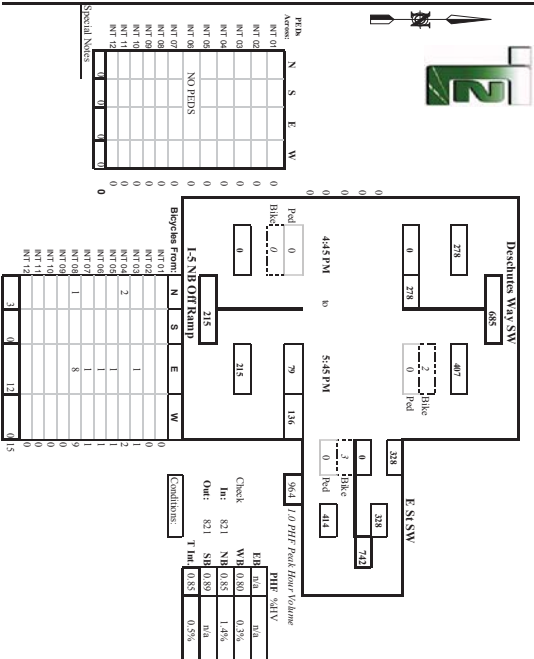
Location: Tumwater, Washington

Date of Count: Thurs 6/25/2015

Checked By: Jess

Time	From North on (SB)				From South on (NB)				From East on (WB)				From West on (EB)				Interval
Interval	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
Deerfield Valley																	
Leading & Trailing	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
4:15 P	1	69	0	0	2	0	26	29	2	0	0	58	0	0	0	0	173
4:30 P	1	48	0	0	1	0	15	31	1	0	0	58	0	0	0	0	152
4:45 P	0	63	0	0	0	0	21	29	0	0	0	52	0	0	0	0	165
5:00 P	0	56	0	0	0	0	18	33	0	0	0	53	0	0	0	0	162
5:15 P	0	78	0	0	1	0	22	33	1	0	0	72	0	0	0	0	205
5:30 P	0	68	0	0	1	0	14	32	0	0	0	99	0	0	0	0	213
5:45 P	0	76	0	0	1	0	25	38	0	0	0	102	0	0	0	0	241
6:00 P	0	36	0	0	0	0	15	26	0	0	0	74	0	0	0	0	151
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Total	2	485	0	0	6	0	155	321	4	0	0	570	0	0	0	1601
Survey																
Peak Hour: 4:45 PM to 5:45 PM																
Total	0	278	0	0	3	0	79	156	1	0	0	328	0	0	0	821
Approach		278					215				328				0	821
%DIV		na					1.4%				0.3%				na	0.5%
PIF		0.89					0.85				0.80				na	0.85



Prepared for: **SCJ Alliance**
Traffic Count Consultants, Inc.

Phone: (253) 926-6099 FAX: (253) 922-7211 E-Mail: Team@TCCinc.com

WB:DBE

Intersection: Capital Blvd SR & E SWSV

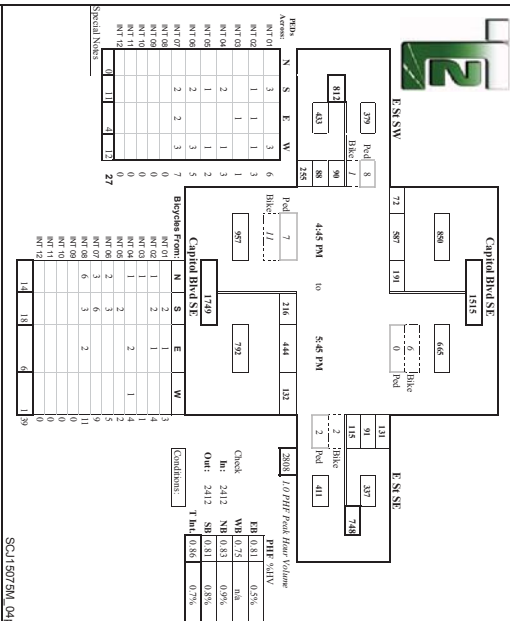
Location: Tumwater, Washington

Date of Count: Thurs 6/25/2015

Checked By: Jess

Time Interval	From North on (SB)				From South on (NB)				From East on (WB)				From West on (EB)				Interval Total
	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
Leading & Trailing	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
4:15 P	2	43	111	17	3	39	98	23	0	18	11	25	0	17	19	51	472
4:30 P	4	46	106	9	2	42	89	21	0	19	19	23	1	20	19	44	457
4:45 P	4	23	142	5	2	28	130	17	0	14	14	16	0	21	20	56	466
5:00 P	1	47	105	6	1	41	105	33	0	22	19	23	0	21	18	40	480
5:15 P	1	44	175	14	2	53	126	35	0	25	18	30	2	19	25	64	628
5:30 P	3	60	182	20	1	65	130	45	0	35	21	31	0	24	27	62	702
5:45 P	2	40	125	32	3	57	83	19	0	33	47	0	26	18	89	402	
6:00 P	1	26	116	22	1	38	97	23	0	22	24	30	0	23	8	39	488
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Total	18	329	1062	125	13	363	838	216	0	188	159	228	3	171	154	445	4295
Survey																	
Peak Hour: 4:45 PM to 5:45 PM																	
Total	7	191	587	72	7	216	444	122	0	115	91	131	2	90	88	252	2412
Approach		180				792				337				433		2412	
%DIV		0.96				0.96				0.96				0.96		0.96	0.96
PIF		0.91				0.92				0.75				0.91		0.86	0.86





Prepared for: **SCJ Alliance**
Traffic Count Consultants, Inc.

Phone: (253) 924-6099 FAX: (253) 922-7211 E-Mail: Tam@TCCinc.com

WB/DRE

Intersection: Cleveland Ave SE & South St SE

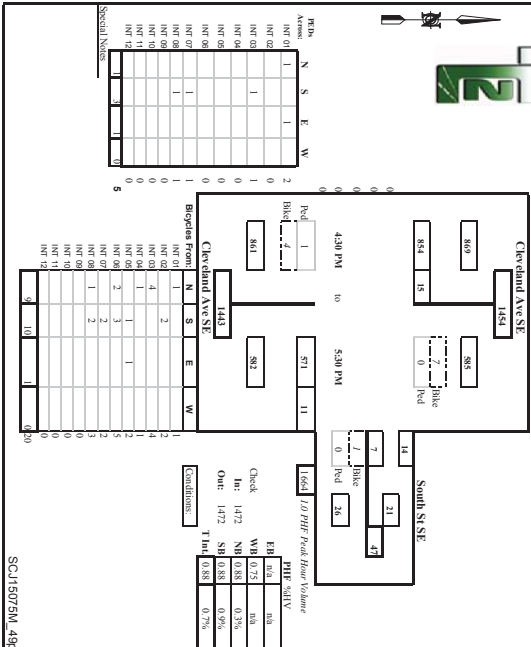
Location: Tamworth, Washington

Date of Count: Thurs 6/25/2015

Checked By: Jess

Time Interval	From North on (SB)				From South on (NB)				From East on (WB)				From West on (EB)				Interval Total
	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	1	2	185	0	1	0	141	2	0	1	0	5	0	0	0	0	336
4:30 P	2	4	183	0	4	0	126	1	0	1	0	0	0	0	0	0	315
4:45 P	1	2	197	0	0	0	133	1	0	0	0	7	0	0	0	0	340
5:00 P	1	5	212	0	0	0	132	5	0	2	0	3	0	0	0	0	359
5:15 P	4	5	202	0	2	0	144	2	0	3	0	1	0	0	0	0	357
5:30 P	2	3	243	0	0	0	162	3	0	2	0	3	0	0	0	0	416
5:45 P	2	3	197	0	0	0	151	1	0	0	0	1	0	0	0	0	353
6:00 P	1	5	176	0	0	0	151	1	1	4	0	5	0	0	0	0	342
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	14	29	1595	0	7	0	1120	16	1	13	0	25	0	0	0	0	2798
Survey																	

Peak Hour: 4:30 PM to 5:30 PM																	
Total	8	15	854	0	2	0	571	11	0	7	0	14	0	0	0	0	1472
Approach																	
%RTV	0.9%																0.7%
PIF	0.08																0.88



Prepared for: **SCJ Alliance**
Traffic Count Consultants, Inc.

Phone: (253) 924-6099 FAX: (253) 922-7211 E-Mail: Tam@TCCinc.com

WB/DRE

Intersection: 7th Ave SW & Linwood Ave SW

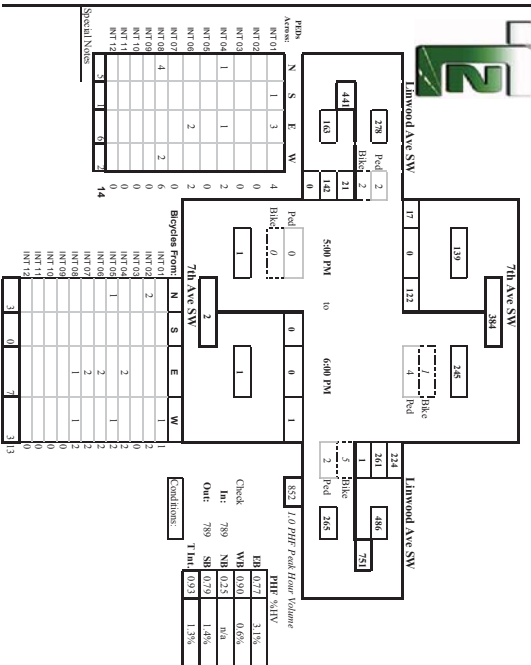
Location: Tumwater, Washington

Date of Count: Tues 6/30/2015

Checked By: Jess

Time Interval	From North on (SB)				From South on (NB)				From East on (WB)				From West on (EB)				Interval Total	
	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R		
4:15 P	1	21	0	4	0	0	0	0	1	0	0	49	55	0	5	40	0	183
4:30 P	0	15	0	3	0	0	0	0	0	64	33	1	2	36	0	151	0	164
4:45 P	3	27	0	7	0	0	0	0	0	0	0	90	43	0	2	35	0	164
5:00 P	1	38	0	4	0	0	0	0	0	2	0	42	30	1	4	31	0	149
5:15 P	1	40	0	4	0	0	0	0	0	1	0	57	46	2	8	33	0	188
5:30 P	0	26	0	4	0	0	0	0	0	1	0	65	70	2	5	36	0	206
5:45 P	1	24	0	7	0	0	0	0	0	0	0	75	48	0	3	25	0	182
6:00 P	0	32	0	2	0	0	0	0	1	1	1	64	60	1	5	48	0	213
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	7	223	0	34	0	0	0	1	7	1	0	466	385	7	34	293	0	1438
Survey																		

Peak Hour: 5:00 PM to 6:00 PM																		
Total Surveys	2	122	0	17	0	0	0	1	3	1	0	281	224	5	21	142	0	789
Approach	13%																	
%RTV	1.4%																	
PIF	0.79																	
	0.25																	
	0.79																	
	0.93																	
	0.93																	





Prepared for:
SCJ Alliance
Traffic Count Consultants, Inc.

Phone: (253) 924-6099 FAX: (253) 922-7211 E-Mail: Team@TCCinc.com

WBE DBE

Intersection: 2nd Ave SW & Limwood Ave SW

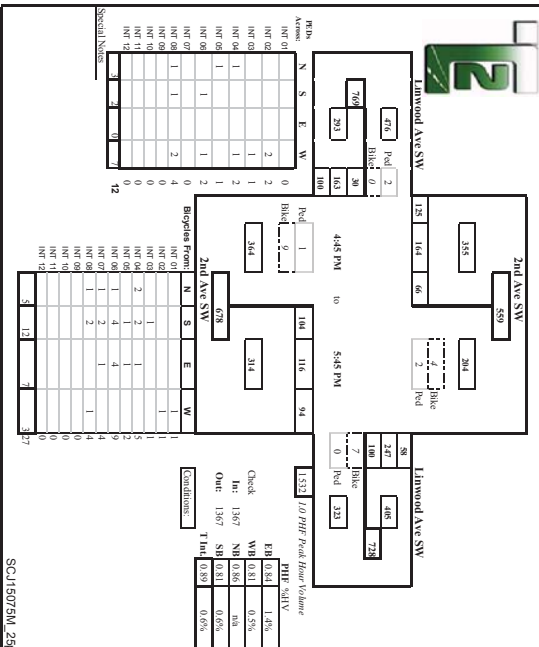
Date of Count: Tues 6/30/2015

Location: Tumwater, Washington

Checked By: Jess

Time Interval	From North on (SB)	From South on (NB)	From East on (WB)	From West on (EB)	Total
4:15 P	1	1	1	1	4
4:30 P	1	1	1	1	4
4:45 P	0	1	1	1	3
5:00 P	1	1	1	1	4
5:15 P	0	1	1	1	3
5:30 P	0	1	1	1	3
5:45 P	0	1	1	1	3
6:00 P	1	1	1	1	4
6:15 P	0	1	1	1	3
6:30 P	0	1	1	1	3
6:45 P	0	1	1	1	3
7:00 P	0	1	1	1	3
Total	4	122	314	223	2583
Survey	4	122	314	223	2583

Time Interval	From North on (SB)	From South on (NB)	From East on (WB)	From West on (EB)	Total
4:15 P	1	1	1	1	4
4:30 P	1	1	1	1	4
4:45 P	0	1	1	1	3
5:00 P	1	1	1	1	4
5:15 P	0	1	1	1	3
5:30 P	0	1	1	1	3
5:45 P	0	1	1	1	3
6:00 P	1	1	1	1	4
6:15 P	0	1	1	1	3
6:30 P	0	1	1	1	3
6:45 P	0	1	1	1	3
7:00 P	0	1	1	1	3
Total	4	122	314	223	2583
Survey	4	122	314	223	2583



Prepared for:
SCJ Alliance
Traffic Count Consultants, Inc.

Phone: (253) 924-6099 FAX: (253) 922-7211 E-Mail: Team@TCCinc.com

WBE DBE

Intersection: Capital Blvd SE & Limwood Ave SW

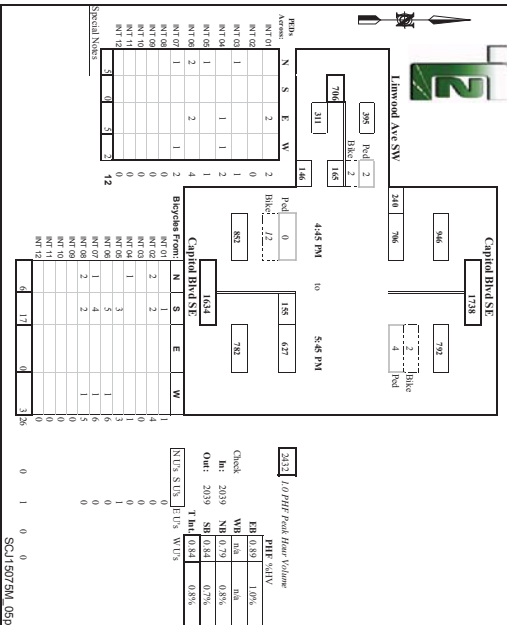
Date of Count: Thurs 6/25/2015

Location: Tumwater, Washington

Checked By: Jess

Time Interval	From North on (SB)	From South on (NB)	From East on (WB)	From West on (EB)	Total
4:15 P	1	1	1	1	4
4:30 P	1	1	1	1	4
4:45 P	0	1	1	1	3
5:00 P	1	1	1	1	4
5:15 P	0	1	1	1	3
5:30 P	0	1	1	1	3
5:45 P	0	1	1	1	3
6:00 P	1	1	1	1	4
6:15 P	0	1	1	1	3
6:30 P	0	1	1	1	3
6:45 P	0	1	1	1	3
7:00 P	0	1	1	1	3
Total	4	122	314	223	2583
Survey	4	122	314	223	2583

Time Interval	From North on (SB)	From South on (NB)	From East on (WB)	From West on (EB)	Total
4:15 P	1	1	1	1	4
4:30 P	1	1	1	1	4
4:45 P	0	1	1	1	3
5:00 P	1	1	1	1	4
5:15 P	0	1	1	1	3
5:30 P	0	1	1	1	3
5:45 P	0	1	1	1	3
6:00 P	1	1	1	1	4
6:15 P	0	1	1	1	3
6:30 P	0	1	1	1	3
6:45 P	0	1	1	1	3
7:00 P	0	1	1	1	3
Total	4	122	314	223	2583
Survey	4	122	314	223	2583





Prepared for
SCJ Alliance
Traffic Count Consultants, Inc.

Phone: (253) 925-6099 FAX: (253) 925-7211 E-Mail: Team@TCCinc.com
WBEDBE

Intersection: Henderson Blvd SE & Yelm Hwy SE

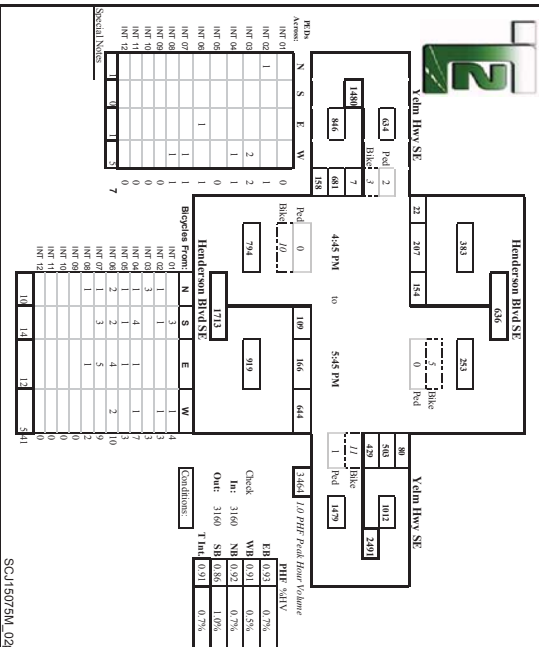
Location: Tumwater, Washington

Date of Count: Thurs 6/25/2015

Checked By: Jess

Time	From North on (SB)				From South on (NB)				From East on (WB)				From West on (EB)				Interval
Interval	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	Total
4:15 P	1	17	32	5	2	24	20	123	4	72	111	12	1	142	27	606	
4:30 P	1	46	40	9	0	12	20	115	3	85	113	14	0	154	22	630	
4:45 P	0	32	33	1	1	29	33	169	2	100	118	25	0	148	34	723	
5:00 P	1	31	42	7	0	33	33	142	0	98	112	21	1	178	35	733	
5:15 P	0	42	46	2	1	24	40	172	3	90	145	20	2	158	30	781	
5:30 P	2	51	53	7	1	27	50	174	1	134	125	18	1	142	44	866	
5:45 P	1	30	46	6	4	25	45	156	1	107	121	21	2	3	105	780	
6:00 P	1	24	51	2	0	18	40	106	5	87	85	11	1	2	109	581	
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total	7	293	363	39	9	192	279	1157	19	773	920	142	8	11	1234	5680	
Survey																	

Peak Hour: 4:45 PM to 5:45 PM																	
Total	4	154	207	22	6	109	166	644	5	429	503	80	6	7	681	3160	
Approach		383				919				1012				846		3160	
%ADV		1.0%				0.2%				0.8%				0.7%		0.2%	
PIV		0.88				0.92				0.91				0.93		0.91	



Prepared for
SCJ Alliance
Traffic Count Consultants, Inc.

Phone: (253) 925-6099 FAX: (253) 925-7211 E-Mail: Team@TCCinc.com
WBEDBE

Intersection: Rural Rd SW & Trooper Rd SW

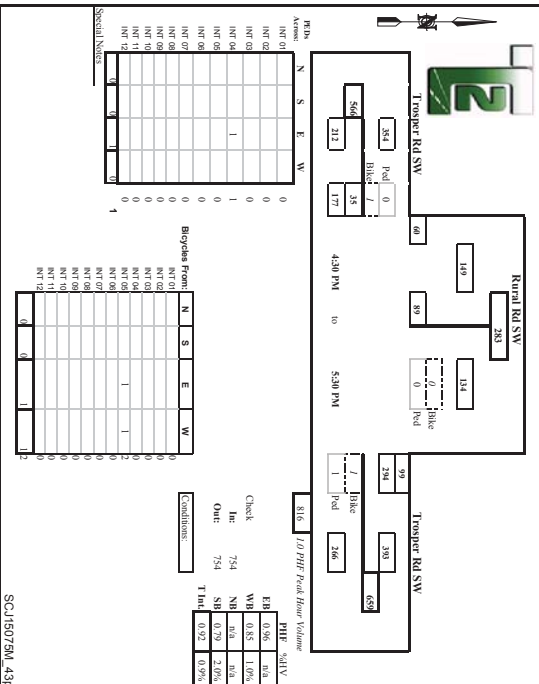
Location: Tumwater, Washington

Date of Count: Thurs 6/25/2015

Checked By: Jess

Time Interval	From North on (SB)				From South on (NB)				From East on (WB)				From West on (EB)				Interval	
	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R		
4:15 P	1	16	0	9	0	0	0	0	0	1	0	69	16	1	8	46	0	164
4:30 P	1	23	0	12	0	0	0	0	4	0	63	19	1	6	49	0	172	
4:45 P	0	23	0	14	0	0	0	0	0	69	30	0	7	48	0	191		
5:00 P	2	17	0	10	0	0	0	0	3	0	75	14	0	10	43	0	160	
5:15 P	0	23	0	24	0	0	0	0	0	64	26	0	10	43	0	190		
5:30 P	1	26	0	12	0	0	0	0	1	0	86	29	0	8	43	0	204	
5:45 P	0	25	0	17	0	0	0	0	0	68	19	1	7	49	0	185		
6:00 P	1	14	0	14	0	0	0	0	1	0	61	20	0	5	52	0	146	
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total	6	167	0	112	0	0	0	0	10	0	555	173	3	61	353	0	1421	
Survey																		

Peak Hour: 4:30 PM to 5:30 PM																
Total	6	167	0	12	0	0	0	10	0	555	173	3	61	553	0	1421
Survey																
	3	98	0	60	0	0	0	4	0	284	99	0	35	277	0	754
Approach		149				0				393				212		754
%ADV		2.0%				0%				1.0%				0.9%		0.9%
PIV		0.79				0.0				0.85				0.98		0.92





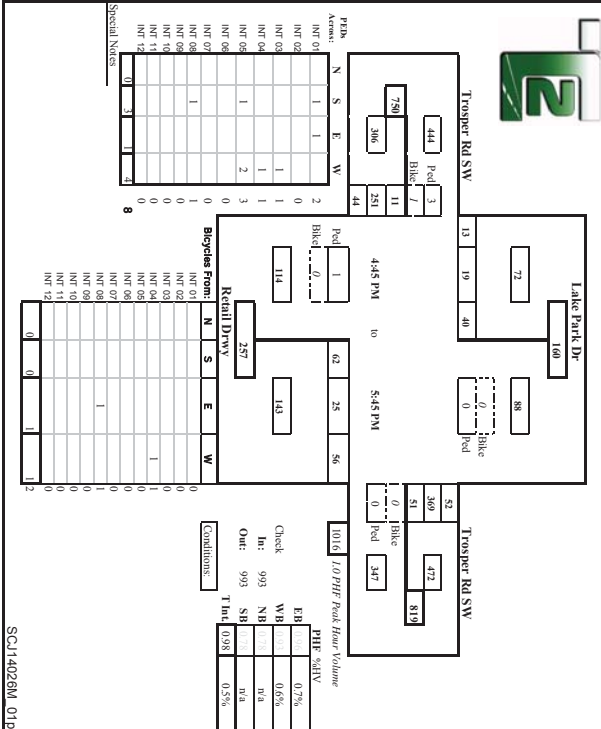
Prepared for: **SCJ Alliance/Shea Carr Jewell**
Traffic Count Consultants, Inc.
Phone (253) 926-6009 FAX: (253) 922-7211 E-Mail: TCarr@TCJCC.com
WBE/DRE

Location: Lake Park Dr & Trooper Rd SW
Tumwater, Washington

Date of Count: Wed 3/05/2014
Checked By: Jss

Time Interval	From North on (SB)			From South on (NB)			From East on (WB)			From West on (EB)			Interval Total				
	L	T	S	L	T	S	L	T	S	L	T	S					
Endure at Lake Park Dr																	
4:15 P	0	9	3	5	0	6	7	0	9	87	6	0	2	400	8	209	
4:30 P	0	9	1	4	0	10	3	12	1	8	87	8	1	62	8	214	
4:45 P	0	6	6	2	0	12	2	15	0	17	75	8	0	4	75	10	232
5:00 P	0	12	3	1	0	11	5	14	1	11	103	13	1	2	63	13	251
5:15 P	0	12	5	6	0	17	4	8	0	13	91	11	0	5	59	10	241
5:30 P	0	10	9	1	0	17	5	16	2	16	87	13	1	2	67	11	254
5:45 P	0	6	2	5	0	17	11	18	0	11	88	15	0	2	62	10	247
6:00 P	0	10	2	1	0	12	5	10	1	12	92	5	1	3	56	8	216
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Total	0	40	19	13	0	62	25	56	3	51	369	52	2	11	251	44	993
Approach																	
%HV																	
PIF																	



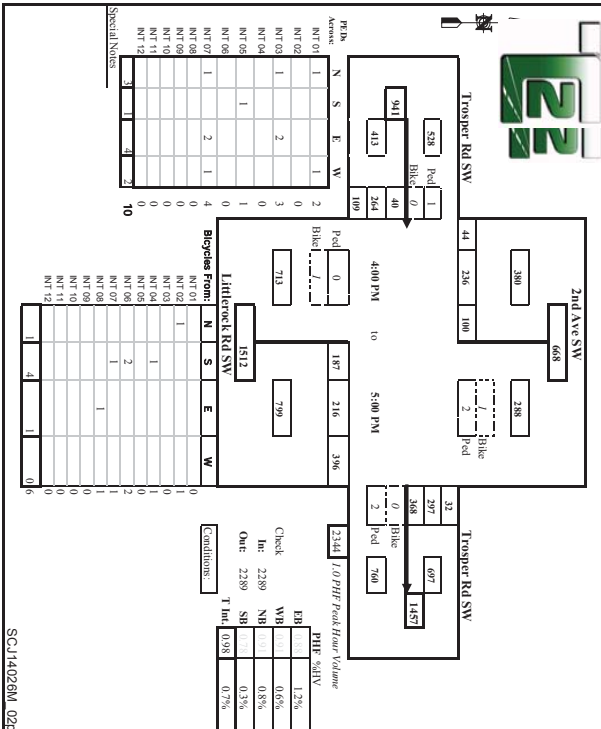
Prepared for: **SCJ Alliance/Shea Carr Jewell**
Traffic Count Consultants, Inc.
Phone (253) 926-6009 FAX: (253) 922-7211 E-Mail: TCarr@TCJCC.com
WBE/DRE

Location: 2nd Ave SW/Littlerock Rd SW & Trooper Rd SW
Tumwater, Washington

Date of Count: Wed 3/05/2014
Checked By: Jss

Time Interval	From North on (SB)						From South on (NB)						From East on (WB)						From West on (EB)						Interval Total																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
	2nd Ave. SW						Littlerock Rd. SW						Traverse Rd. SW						Traverse Rd. SW																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
Endure at	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R	T	S	L	T	S	R

Total	1	100	216	44	6	187	216	396	4	368	297	32	5	40	264	109	2289
Approach																	
%HV																	
PIF																	





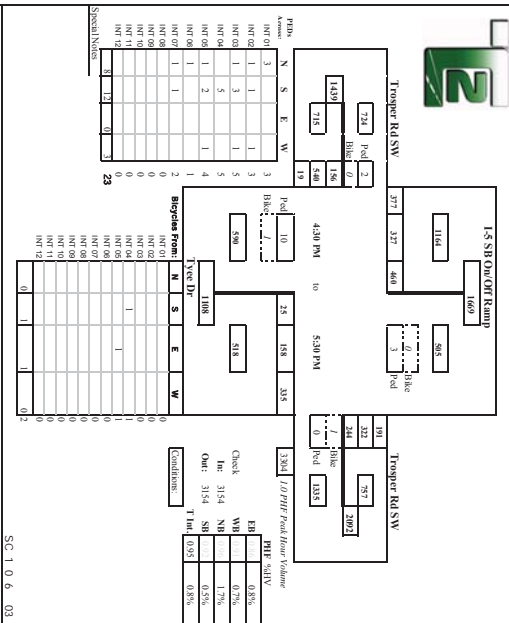
Prepared for: **SCJ Alliance/Shea Carr Jewell**
Traffic Count Consultants, Inc.
Phone (253) 926-6009 FAX (253) 922-7271 E-Mail: Turner@TCCinc.com
WBE/DBE

Intersection: I-5 NB On/Off Ramp/Troyer Rd SW
Location: Tumwater, Washington

Date of Count: Wed 3/16/2014
Checked By: Jesse

Time Interval	From North on (SB)	From South on (NB)	From East on (WB)	From West on (EB)	Interval Total
Leading at I-5 NB On/Off Ramp	T	L	S	R	
4:15 P	0	0	0	0	0
4:30 P	0	0	0	0	0
4:45 P	0	0	0	0	0
5:00 P	0	0	0	0	0
5:15 P	0	0	0	0	0
5:30 P	0	0	0	0	0
5:45 P	0	0	0	0	0
6:00 P	0	0	0	0	0
6:15 P	0	0	0	0	0
6:30 P	0	0	0	0	0
6:45 P	0	0	0	0	0
7:00 P	0	0	0	0	0
Total	0	0	0	0	0
Survey	0	0	0	0	0

Time Interval	From North on (SB)	From South on (NB)	From East on (WB)	From West on (EB)	Interval Total
Approach	0	0	0	0	0
4:15 P	0	0	0	0	0
4:30 P	0	0	0	0	0
4:45 P	0	0	0	0	0
5:00 P	0	0	0	0	0
5:15 P	0	0	0	0	0
5:30 P	0	0	0	0	0
5:45 P	0	0	0	0	0
6:00 P	0	0	0	0	0
6:15 P	0	0	0	0	0
6:30 P	0	0	0	0	0
6:45 P	0	0	0	0	0
7:00 P	0	0	0	0	0
Total	0	0	0	0	0
Survey	0	0	0	0	0



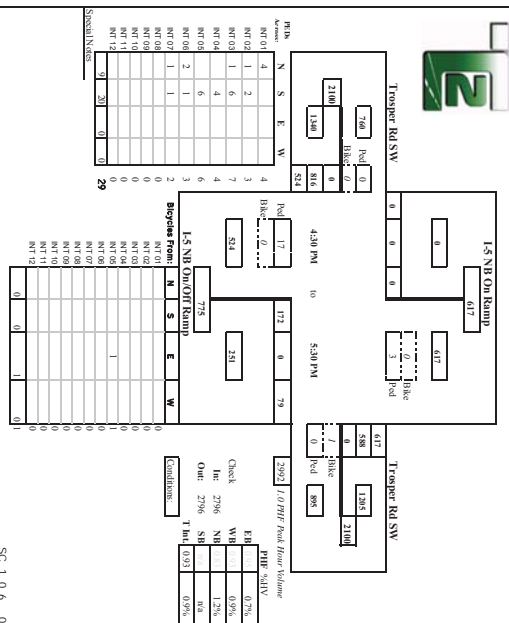
Prepared for: **SCJ Alliance/Shea Carr Jewell**
Traffic Count Consultants, Inc.
Phone (253) 926-6009 FAX (253) 922-7271 E-Mail: Turner@TCCinc.com
WBE/DBE

Intersection: I-5 NB On/Off Ramp/Troyer Rd SW
Location: Tumwater, Washington

Date of Count: Wed 3/16/2014
Checked By: Jesse

Time Interval	From North on (SB)	From South on (NB)	From East on (WB)	From West on (EB)	Interval Total
Leading at I-5 NB On/Off Ramp	T	L	S	R	
4:15 P	0	0	0	0	0
4:30 P	0	0	0	0	0
4:45 P	0	0	0	0	0
5:00 P	0	0	0	0	0
5:15 P	0	0	0	0	0
5:30 P	0	0	0	0	0
5:45 P	0	0	0	0	0
6:00 P	0	0	0	0	0
6:15 P	0	0	0	0	0
6:30 P	0	0	0	0	0
6:45 P	0	0	0	0	0
7:00 P	0	0	0	0	0
Total	0	0	0	0	0
Survey	0	0	0	0	0

Time Interval	From North on (SB)	From South on (NB)	From East on (WB)	From West on (EB)	Interval Total
Approach	0	0	0	0	0
4:15 P	0	0	0	0	0
4:30 P	0	0	0	0	0
4:45 P	0	0	0	0	0
5:00 P	0	0	0	0	0
5:15 P	0	0	0	0	0
5:30 P	0	0	0	0	0
5:45 P	0	0	0	0	0
6:00 P	0	0	0	0	0
6:15 P	0	0	0	0	0
6:30 P	0	0	0	0	0
6:45 P	0	0	0	0	0
7:00 P	0	0	0	0	0
Total	0	0	0	0	0
Survey	0	0	0	0	0



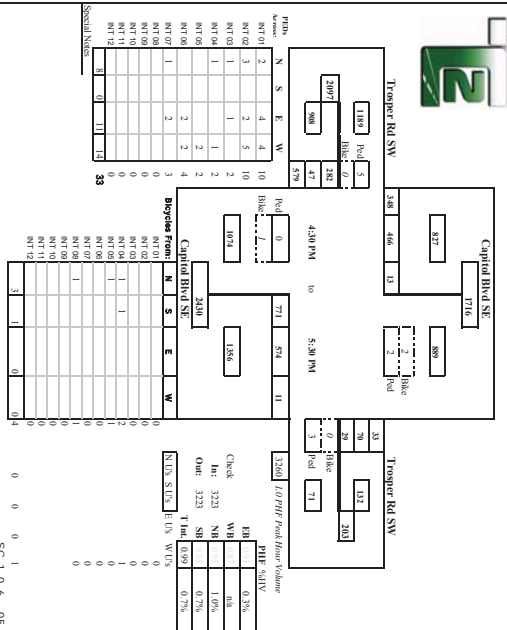


Date of Count: Wed 3/05/2014

Date of Count: Wed 3/05/2014
Checked By: Jess

Year	Area	From North on (SE)	From North on (NW)	From East on (NW)	From East on (SE)	From West on (SE)	From West on (NW)	Interval Total
1840	Barren	0	0	0	0	0	0	0
1841	Barren	0	0	0	0	0	0	0
1842	Barren	0	0	0	0	0	0	0
1843	Barren	0	0	0	0	0	0	0
1844	Barren	0	0	0	0	0	0	0
1845	Barren	0	0	0	0	0	0	0
1846	Barren	0	0	0	0	0	0	0
1847	Barren	0	0	0	0	0	0	0
1848	Barren	0	0	0	0	0	0	0
1849	Barren	0	0	0	0	0	0	0
1850	Barren	0	0	0	0	0	0	0
1851	Barren	0	0	0	0	0	0	0
1852	Barren	0	0	0	0	0	0	0
1853	Barren	0	0	0	0	0	0	0
1854	Barren	0	0	0	0	0	0	0
1855	Barren	0	0	0	0	0	0	0
1856	Barren	0	0	0	0	0	0	0
1857	Barren	0	0	0	0	0	0	0
1858	Barren	0	0	0	0	0	0	0
1859	Barren	0	0	0	0	0	0	0
1860	Barren	0	0	0	0	0	0	0
1861	Barren	0	0	0	0	0	0	0
1862	Barren	0	0	0	0	0	0	0
1863	Barren	0	0	0	0	0	0	0
1864	Barren	0	0	0	0	0	0	0
1865	Barren	0	0	0	0	0	0	0
1866	Barren	0	0	0	0	0	0	0
1867	Barren	0	0	0	0	0	0	0
1868	Barren	0	0	0	0	0	0	0
1869	Barren	0	0	0	0	0	0	0
1870	Barren	0	0	0	0	0	0	0
1871	Barren	0	0	0	0	0	0	0
1872	Barren	0	0	0	0	0	0	0
1873	Barren	0	0	0	0	0	0	0
1874	Barren	0	0	0	0	0	0	0
1875	Barren	0	0	0	0	0	0	0
1876	Barren	0	0	0	0	0	0	0
1877	Barren	0	0	0	0	0	0	0
1878	Barren	0	0	0	0	0	0	0
1879	Barren	0	0	0	0	0	0	0
1880	Barren	0	0	0	0	0	0	0
1881	Barren	0	0	0	0	0	0	0
1882	Barren	0	0	0	0	0	0	0
1883	Barren	0	0	0	0	0	0	0
1884	Barren	0	0	0	0	0	0	0
1885	Barren	0	0	0	0	0	0	0
1886	Barren	0	0	0	0	0	0	0
1887	Barren	0	0	0	0	0	0	0
1888	Barren	0	0	0	0	0	0	0
1889	Barren	0	0	0	0	0	0	0
1890	Barren	0	0	0	0	0	0	0
1891	Barren	0	0	0	0	0	0	0
1892	Barren	0	0	0	0	0	0	0
1893	Barren	0	0	0	0	0	0	0
1894	Barren	0	0	0	0	0	0	0
1895	Barren	0	0	0	0	0	0	0
1896	Barren	0	0	0	0	0	0	0
1897	Barren	0	0	0	0	0	0	0
1898	Barren	0	0	0	0	0	0	0
1899	Barren	0	0	0	0	0	0	0
1900	Barren	0	0	0	0	0	0	0

	Pose Height = 4.30 PMd to 5.30 PMd															
Survey	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Tall	15	33	861	653	21	1457	979	19	0	58	120	54	101	504	84	1153
Total	6	13	406	348	13	771	99	11	0	29	70	31	3	282	47	290
Approach			827			1156					132			908		3252
MATV			0.7%			1.0%					m			0.3%		0.7%
HRT			0.2%			0.3%					0.2%			0.2%		0.9%

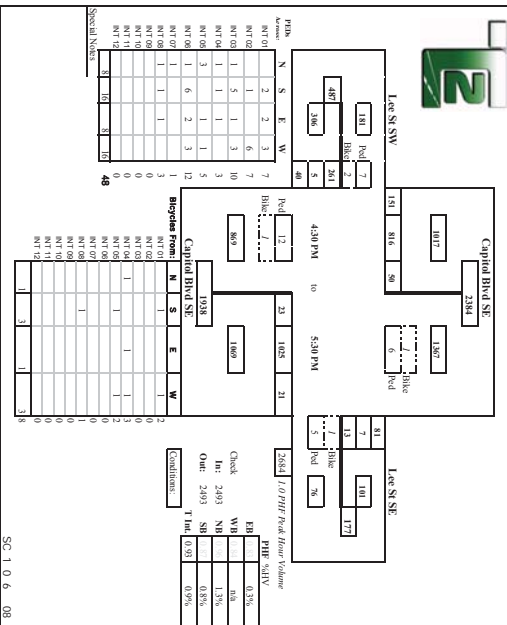


Date of Count: Wed 3/05/2014

Date of Count:	Wed 3/05/2014
Checked By:	Jess

[illegible]

	Peak Height												to				Total
Source	4.50 PM												5.50 PM				Sources
	20	95	194	276	30	49	1836	33	0	23	14	144	4	475	8	79	4616
Absorbed	8	50	316	151	14	23	1005	21	0	13	7	81	1	261	5	40	2495
Active			1017				169				101			506			2495
ORR%							1.3%				n/a			0.7%			0.7%
PHE							0.7%				0.7%			0.7%			0.51





Prepared for
SCJ Alliance
Traffic Count Consultants, Inc.
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WEB/DRE

Intersection: Littlefork Rd SW & Fred Meyer/Casco Hwy

Date of Count: Wed 6/24/2015

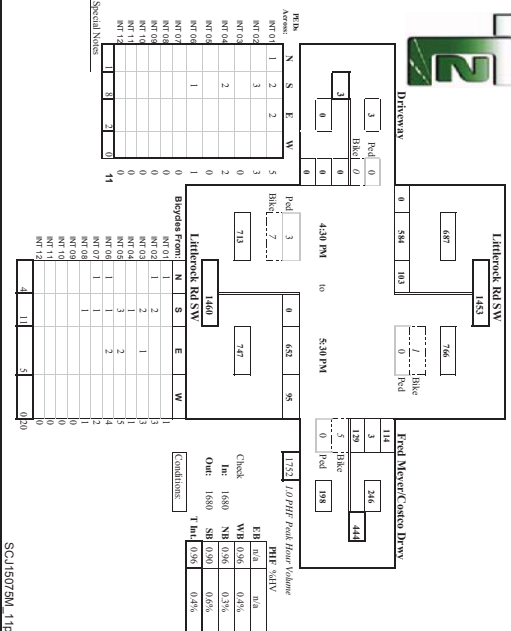
Location: Tammack, Washington

Checked By: Jass

Time	From North on (SB)	From South on (NB)	From East on (WB)	From West on (EB)	Interval
Interval	Littlefork Rd SW	Littlefork Rd SW	Fred Meyer/Casco Hwy	Driveway	Total
4:15P	1 20 153 0 1 0 180 18 0 27 1 29 0 0 0 0 1 380				
4:30P	3 28 152 0 1 0 153 23 1 26 1 26 0 0 0 0 391				
4:45P	1 34 156 0 0 0 167 26 0 31 0 24 0 0 0 0 418				
5:00P	2 27 144 0 1 0 175 19 1 35 1 28 0 0 0 0 429				
5:15P	0 22 144 0 0 0 157 30 0 30 0 33 0 0 0 0 416				
5:30P	1 20 140 0 1 0 153 20 0 33 2 29 0 0 0 0 397				
5:45P	0 18 111 0 0 0 123 25 0 26 0 28 0 0 0 0 331				
6:00P	0 19 114 0 2 0 128 16 1 28 1 18 0 0 0 0 324				
6:15P	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0				
6:30P	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0				
6:45P	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0				
7:00P	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0				

Total	8	180	1066	0	6	0	1187	177	3	236	6	215	0	0	0	1	3106
Survey																	
Peak Hour: 4:30 PM																	
Total	4	103	384	0	2	0	632	95	1	129	3	114	0	0	0	1	1680
Approach																	
SAUV																	
PH1																	

Total	4	103	384	0	2	0	632	95	1	129	3	114	0	0	0	1	1680
Approach																	
SAUV																	
PH1																	



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WEB/DRE

Intersection: Littlefork Rd SW & Casco Hwy

Date of Count: Wed 6/24/2015

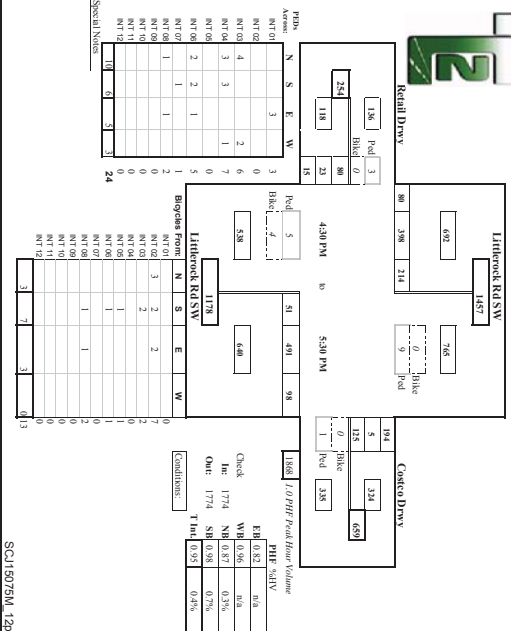
Location: Tammack, Washington

Checked By: Jass

Time	From North on (SB)	From South on (NB)	From East on (WB)	From West on (EB)	Interval
Interval	Littlefork Rd SW	Littlefork Rd SW	Casco Hwy	Residential Driveway	Total
4:15P	1 33 87 25 2 8 100 27 1 27 3 48 0 16 9 8 413				
4:30P	3 43 101 30 0 4 98 24 0 33 1 46 0 15 7 9 411				
4:45P	1 33 99 24 0 10 148 26 0 30 0 53 0 16 7 1 467				
5:00P	3 39 92 26 1 13 96 22 0 25 0 59 0 21 8 3 424				
5:15P	0 46 101 20 0 9 128 25 0 36 1 38 0 27 3 6 440				
5:30P	1 36 106 10 1 19 119 25 0 34 4 44 0 16 5 5 443				
5:45P	0 40 91 14 1 15 81 24 0 21 3 38 0 18 8 8 361				
6:00P	3 41 87 0 1 9 86 21 0 13 0 43 0 21 5 13 339				
6:15P	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0				
6:30P	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0				
6:45P	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0				
7:00P	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0				

Total	12	391	364	149	6	87	856	194	1	219	14	369	0	150	52	53	2298
Survey																	
Peak Hour: 4:30 PM																	
Total	5	214	398	80	2	51	491	98	0	125	5	154	0	80	23	13	1774
Approach																	
SAUV																	
PH1																	

Total	5	214	398	80	2	51	491	98	0	125	5	154	0	80	23	13	1774
Approach																	
SAUV																	
PH1																	





Prepared for: **SCJ Alliance**
Traffic Count Consultants, Inc.

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WB/DRE

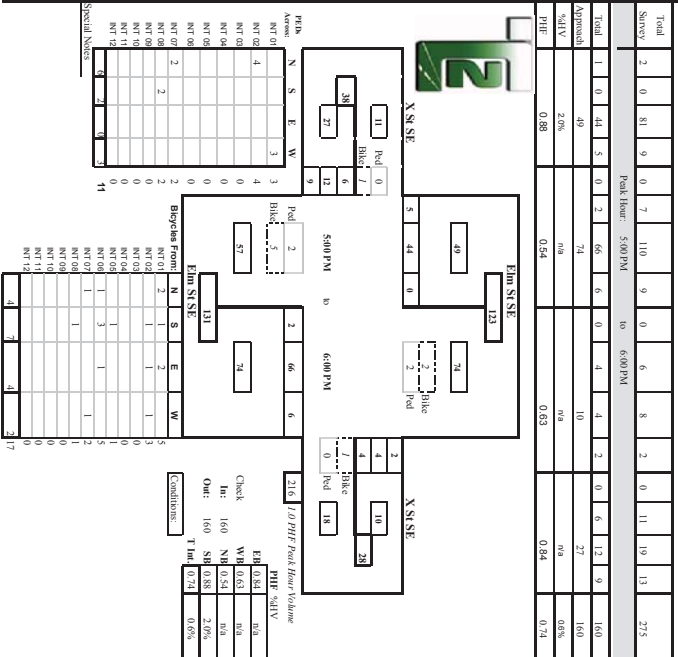
Intersection: Elm St SE & X St SE

Location: Tumwater, Washington

Date of Count: Thurs 6/25/2015

Checked By: Jess

Time Interval	From North on (SB)				From South on (NB)				From East on (WB)				From West on (EB)				Interval Total	
	E-MS-150				E-MS-150				X-MS-150				X-MS-150					
	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	T		
4:15P	1	0	3	0	1	0	2	0	13	0	0	0	1	0	0	1	1	22
4:30P	0	0	13	0	0	1	12	1	0	0	2	0	0	0	3	3	35	
4:45P	0	0	10	2	0	1	12	0	0	1	0	0	0	1	3	0	30	
5:00P	0	0	11	2	0	1	7	2	0	1	1	0	0	3	0	0	28	
5:15P	0	0	12	0	0	1	29	4	0	0	2	0	1	0	1	2	54	
5:30P	1	0	8	2	0	1	16	0	0	0	2	0	0	4	1	1	35	
5:45P	0	0	13	1	0	0	10	2	0	0	1	0	0	0	4	4	35	
6:00P	0	0	11	2	0	0	11	0	0	0	2	2	0	0	1	5	26	
6:15P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6:30P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6:45P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:00P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	



Prepared for: **SCJ Alliance/Shea Carr Jewell**
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WB/DRE

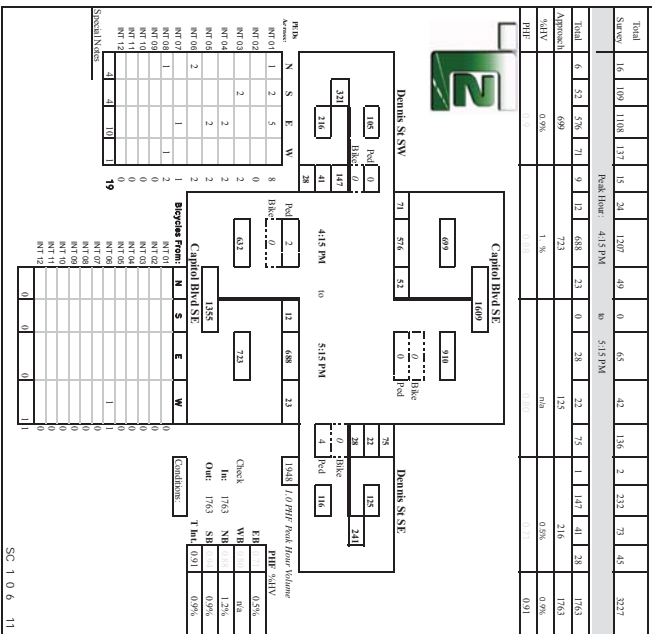
Intersection: Capital Blvd SE & Dennis St SE SW

Location: Tumwater, Washington

Date of Count: Wed 3/10/2014

Checked By: Jess

Time Interval	From North on (SB)				From South on (NB)				From East on (WB)				From West on (EB)				Interval Total
	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	T	
4:15 P	2	14	156	19	2	2	144	15	0	16	4	15	0	28	7	4	403
4:30 P	3	17	139	13	2	4	151	4	0	7	5	14	0	30	4	7	395
4:45 P	1	7	152	12	2	4	153	7	0	8	8	23	0	32	12	5	425
5:00 P	0	0	16	134	23	2	3	196	6	0	7	5	16	0	42	4	456
5:15 P	2	12	151	23	3	1	186	6	0	6	4	22	1	43	21	12	487
5:30 P	2	15	125	19	2	5	135	4	0	7	4	11	0	23	9	6	366
5:45 P	4	17	156	13	1	3	148	4	0	6	8	18	0	19	7	3	402
6:00 P	2	11	116	15	1	2	91	3	0	8	4	17	1	13	9	4	295
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	16	109	1108	137	15	24	1207	49	0	65	42	136	2	212	79	43	3277
Survey	Peak Hour: 4:15 PM to 5:15 PM																
Total	6	52	576	71	9	12	688	21	0	28	22	75	1	147	41	28	1763
Approach	609																1763
%RTV	0.9%																0.7%
PIF	0.96																0.91





Prepared for: **SCJ Alliance**
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WBEDBE

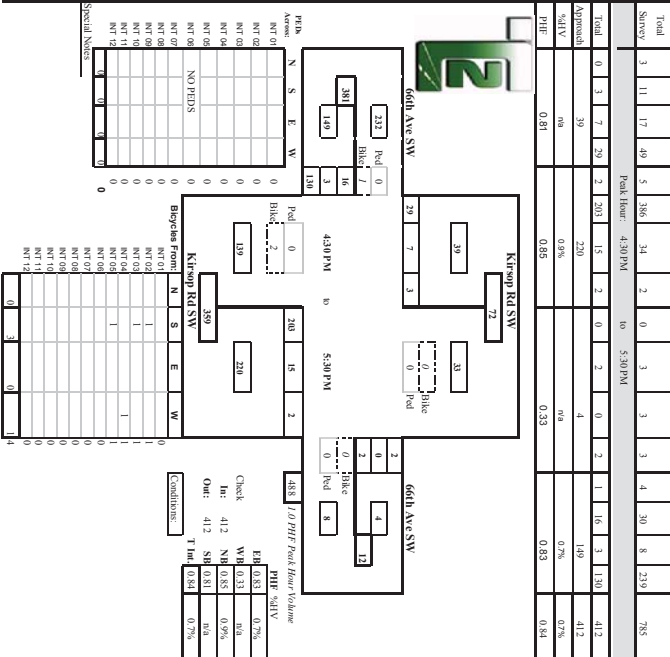
Intersection: Knap RD SW & 66th Ave SW

Date of Count: Tues 6/30/2015

Location: Turnover, Washington

Checked By: Jess

Time Interval	From North on (SB)	From South on (NB)	From East on (WB)	From West on (EB)	Interval Total
4:15 P	0	0	1	0	1
4:30 P	0	2	3	0	5
4:45 P	0	1	3	8	12
5:00 P	0	0	2	9	11
5:15 P	0	0	1	7	8
5:30 P	0	2	1	5	8
5:45 P	1	4	2	1	8
6:00 P	2	2	4	1	9
6:15 P	0	0	0	0	0
6:30 P	0	0	0	0	0
6:45 P	0	0	0	0	0
7:00 P	0	0	0	0	0
Total	3	11	40	5	78
Survey	11	17	40	5	73
Peak Hour: 4:30 PM to 5:30 PM	3	11	40	5	73
Total	0	3	7	20	30
Approach	na	na	na	na	na
%IV	0.81	0.85	0.83	0.84	0.83
PIF	0.81	0.85	0.83	0.84	0.83



Prepared for: **SCJ Alliance**
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WBEDBE

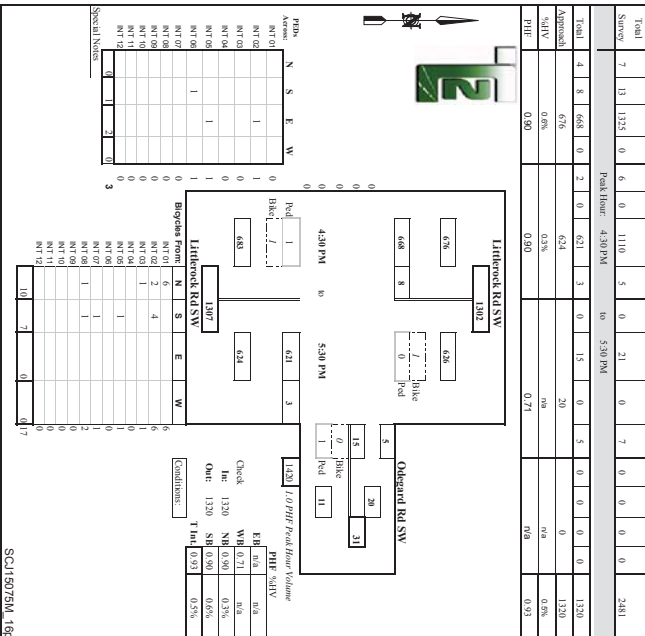
Intersection: Lathrop Rd SW & Odgers Rd SW

Date of Count: Wed 6/24/2015

Location: Turnover, Washington

Checked By: Jess

Time Interval	From North on (SB)	From South on (NB)	From East on (WB)	From West on (EB)	Interval Total
4:15 P	0	1	153	0	154
4:30 P	1	0	164	0	165
4:45 P	1	2	164	0	167
5:00 P	2	0	158	0	160
5:15 P	0	3	161	0	164
5:30 P	1	3	185	0	189
5:45 P	0	3	173	0	176
6:00 P	2	1	149	0	152
6:15 P	0	0	0	0	0
6:30 P	0	0	0	0	0
6:45 P	0	0	0	0	0
7:00 P	0	0	0	0	0
Total	7	13	1325	0	1345
Survey	13	13	1325	0	1351
Peak Hour: 4:30 PM to 5:30 PM	7	13	1325	0	1351
Total	4	8	668	0	680
Approach	67%	67%	67%	67%	67%
%IV	0.96	0.96	0.96	0.96	0.96
PIF	0.90	0.90	0.90	0.90	0.90





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WBEDBE

Date of Count: Wed 6/24/2015

Intersection: Lifford Rd SW & Bear Rd SW/70th Ave SW

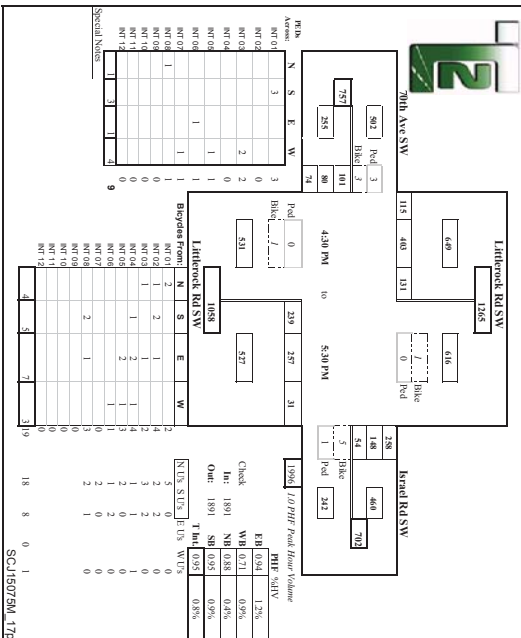
Location: Turnward, Washington

Checked By: Jass

Time	From North on (SB)	From South on (NB)	From East on (WB)	From West on (EB)	Interval
Interval	Lifford Rd SW	Lifford Rd SW	Bear Rd SW	70th Ave SW	Total
4:15P	0 31 41 23 1	0 31 40 31 6	2 12 26 69 1	18 13 24 385	
4:30P	1 29 111 26 1	1 45 52 7 0	11 27 50 0	15 18 21 412	
4:45P	1 38 102 20 1	1 62 71 4 0	14 37 62 1	20 19 20 469	
5:00P	4 35 91 32 0	52 65 9 1	5 28 45 1	24 25 15 426	
5:15P	0 30 104 26 1	1 62 46 6 2	26 54 81 1	29 20 15 499	
5:30P	1 28 106 37 0	63 75 12 1	9 29 70 0	28 16 24 497	
5:45P	1 27 99 37 2	47 65 5 1	9 35 52 0	15 24 16 431	
6:00P	2 30 102 33 0	64 50 4 0	7 25 28 2	23 17 23 406	
6:15P	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	
6:30P	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	
6:45P	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	
7:00P	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	

Total	10	248	796	234	8	435	53	7	93	261	448	6	172	152	158	3525
Survey																
Peak Hour: 4:30 PM																
Total	6	131	403	115	2	239	237	31	4	54	148	326	3	101	80	74
Approach																
SAIV																
PHI																

Total	6	131	403	115	2	239	237	31	4	54	148	326	3	101	80	74
Approach																
SAIV																
PHI																



Prepared for
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WBEDBE

Date of Count: Wed 6/24/2015

Intersection: Lifford Way SW/11th Ave SW & Bear Rd SW

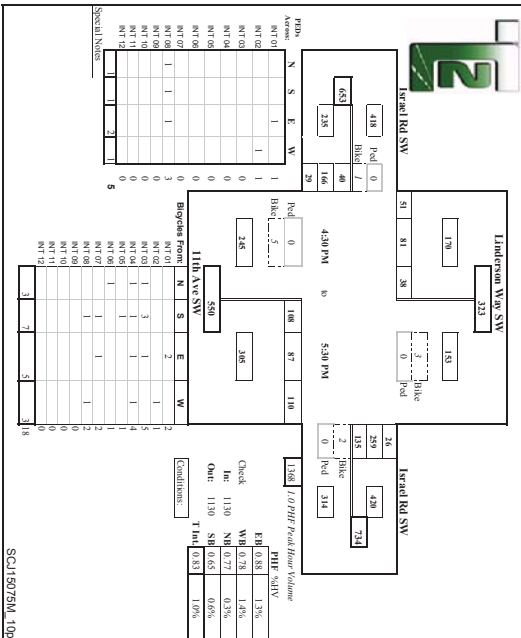
Location: Turnward, Washington

Checked By: Jass

Time	From North on (SB)	From South on (NB)	From East on (WB)	From West on (EB)	Interval
Interval	Lifford Way SW	11th Ave SW	Bear Rd SW	Lifford Rd SW	Total
4:15P	0 6 27 14 0	22 13 29 3	46 79 15 0	6 32 19 308	
4:30P	0 10 18 12 1	22 13 16 1	29 62 4 0	3 40 10 302	
4:45P	1 10 22 11 0	35 27 37 2	26 65 7 1	6 46 10 302	
5:00P	0 8 14 7 0	16 21 23 1	27 49 3 2	17 43 7 215	
5:15P	0 15 27 23 1	14 22 30 2	49 79 6 0	6 38 4 342	
5:30P	0 5 18 10 0	14 17 20 1	33 66 10 0	11 39 8 251	
5:45P	0 5 15 12 0	18 21 1 2	30 63 4 1	8 35 10 222	
6:00P	0 2 11 13 0	5 15 16 1	17 50 4 0	14 28 9 184	
6:15P	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	
6:30P	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	
6:45P	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	
7:00P	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	

Total	1	61	152	102	2	175	149	172	13	257	513	53	4	70	301	775
Survey																
Peak Hour: 4:30 PM																
Total	1	38	81	51	1	108	87	110	6	135	299	26	3	40	166	29
Approach																
SAIV																
PHI																

Total	1	38	81	51	1	108	87	110	6	135	299	26	3	40	166	29
Approach																
SAIV																
PHI																





WB/E/DBE

Intersection: Litterock Rd SW & Turnwater Blvd SW

Date of Count: Wed 6/24/2015

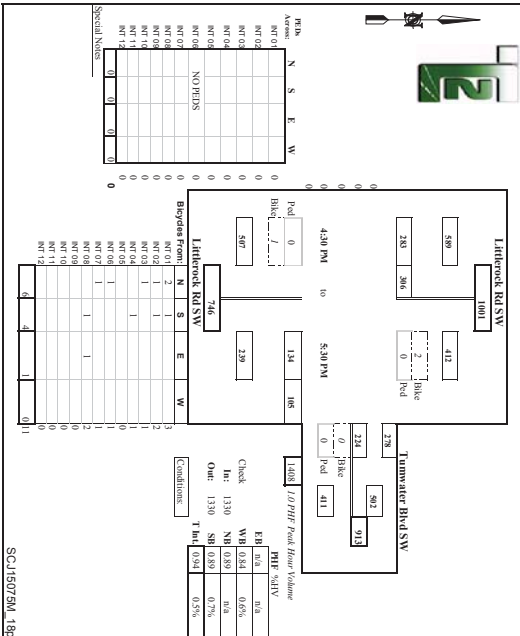
Location: Tumwater, Washington

Checked

Jess

1

Time	From North on (SB)		From South on (NB)		From East on (WB)		From West on (EB)		Interfered								
	Left	Right	Left	Right	Left	Right	Left	Right									
5:15 P	0	72	0	1	0	33	1	3	49	0	54	0	0	0	0	0	31
5:30 P	0	67	89	0	0	32	19	0	48	0	58	0	0	0	0	0	313
5:45 P	1	74	70	0	0	31	28	1	80	0	69	0	0	0	0	0	352
6:00 P	3	77	54	0	0	36	27	1	36	0	69	0	0	0	0	0	349
6:15 P	0	75	91	0	0	35	15	1	71	1	69	0	0	0	0	0	297
6:30 P	0	80	68	0	0	32	35	0	37	0	80	0	0	0	0	0	332
6:45 P	1	79	68	0	1	43	11	1	49	0	67	0	0	0	0	0	317
7:00 P	2	69	48	0	0	29	33	0	43	0	64	0	0	0	0	0	277
7:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

[illegible][illegible]

W/BE/D

Intersection: I-5 SB Ramps & Tumwater Blvd

Date of Count: Wed 6/24/2011

Location: Tumwater, Washington

Checked By: Jess

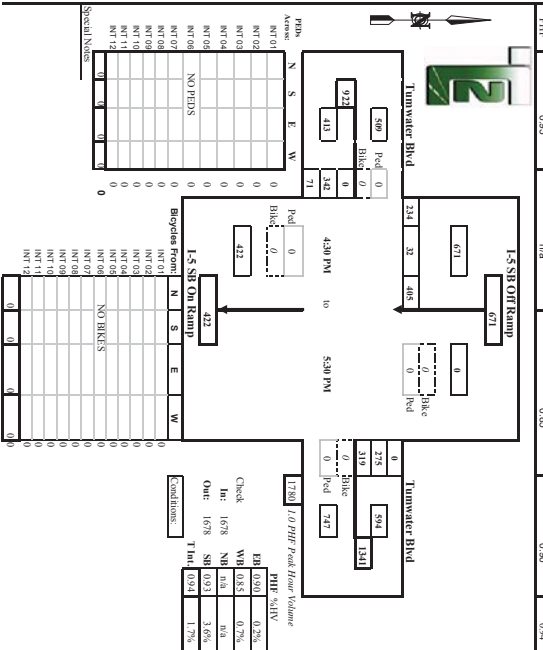
Jess

— 100 —

Time	From North (NB)	From South (SB)	From East (NE)	From West (NW)	From East (EB)	From West (WB)	Total
Interval	1	1	1	1	1	1	6
4:15-4:30 P	1	0	0	0	0	0	1
4:30-4:45 P	1	0	0	1	66	53	1
4:45-5:00 P	5	96	6	0	66	60	0
5:00-5:15 P	1	101	6	0	77	89	0
5:15-5:30 P	3	102	10	0	62	58	0
5:30-5:45 P	8	104	8	0	117	63	0
5:45-6:00 P	6	98	8	0	68	65	0
6:00-6:15 P	6	98	8	0	2	68	19
6:15-6:30 P	3	98	3	0	0	58	66
6:30-6:45 P	7	83	9	0	0	35	56
6:45-7:00 P	9	51	0	0	0	2	85
7:00-7:15 P	0	0	0	0	0	0	10
7:15-7:30 P	0	0	0	0	0	0	10
7:30-7:45 P	0	0	0	0	0	0	0
7:45-8:00 P	0	0	0	0	0	0	0
8:00-8:15 P	0	0	0	0	0	0	0
8:15-8:30 P	0	0	0	0	0	0	0
8:30-8:45 P	0	0	0	0	0	0	0
8:45-9:00 P	0	0	0	0	0	0	0
9:00-9:15 P	0	0	0	0	0	0	0
9:15-9:30 P	0	0	0	0	0	0	0
9:30-9:45 P	0	0	0	0	0	0	0
9:45-10:00 P	0	0	0	0	0	0	0
10:00-10:15 P	0	0	0	0	0	0	0
10:15-10:30 P	0	0	0	0	0	0	0
10:30-10:45 P	0	0	0	0	0	0	0
10:45-11:00 P	0	0	0	0	0	0	0
11:00-11:15 P	0	0	0	0	0	0	0
11:15-11:30 P	0	0	0	0	0	0	0
11:30-11:45 P	0	0	0	0	0	0	0
11:45-12:00 P	0	0	0	0	0	0	0
12:00-12:15 P	0	0	0	0	0	0	0
12:15-12:30 P	0	0	0	0	0	0	0
12:30-12:45 P	0	0	0	0	0	0	0
12:45-1:00 P	0	0	0	0	0	0	0
1:00-1:15 P	0	0	0	0	0	0	0
1:15-1:30 P	0	0	0	0	0	0	0
1:30-1:45 P	0	0	0	0	0	0	0
1:45-2:00 P	0	0	0	0	0	0	0
2:00-2:15 P	0	0	0	0	0	0	0
2:15-2:30 P	0	0	0	0	0	0	0
2:30-2:45 P	0	0	0	0	0	0	0
2:45-3:00 P	0	0	0	0	0	0	0
3:00-3:15 P	0	0	0	0	0	0	0
3:15-3:30 P	0	0	0	0	0	0	0
3:30-3:45 P	0	0	0	0	0	0	0
3:45-4:00 P	0	0	0	0	0	0	0
4:00-4:15 P	0	0	0	0	0	0	0
4:15-4:30 P	0	0	0	0	0	0	0
4:30-4:45 P	0	0	0	0	0	0	0
4:45-5:00 P	0	0	0	0	0	0	0
5:00-5:15 P	0	0	0	0	0	0	0
5:15-5:30 P	0	0	0	0	0	0	0
5:30-5:45 P	0	0	0	0	0	0	0
5:45-6:00 P	0	0	0	0	0	0	0
6:00-6:15 P	0	0	0	0	0	0	0
6:15-6:30 P	0	0	0	0	0	0	0
6:30-6:45 P	0	0	0	0	0	0	0
6:45-7:00 P	0	0	0	0	0	0	0
7:00-7:15 P	0	0	0	0	0	0	0
7:15-7:30 P	0	0	0	0	0	0	0
7:30-7:45 P	0	0	0	0	0	0	0
7:45-8:00 P	0	0	0	0	0	0	0
8:00-8:15 P	0	0	0	0	0	0	0
8:15-8:30 P	0	0	0	0	0	0	0
8:30-8:45 P	0	0	0	0	0	0	0
8:45-9:00 P	0	0	0	0	0	0	0
9:00-9:15 P	0	0	0	0	0	0	0
9:15-9:30 P	0	0	0	0	0	0	0
9:30-9:45 P	0	0	0	0	0	0	0
9:45-10:00 P	0	0	0	0	0	0	0
10:00-10:15 P	0	0	0	0	0	0	0
10:15-10:30 P	0	0	0	0	0	0	0
10:30-10:45 P	0	0	0	0	0	0	0
10:45-11:00 P	0	0	0	0	0	0	0
11:00-11:15 P	0	0	0	0	0	0	0
11:15-11:30 P	0	0	0	0	0	0	0
11:30-11:45 P	0	0	0	0	0	0	0
11:45-12:00 P	0	0	0	0	0	0	0
12:00-12:15 P	0	0	0	0	0	0	0
12:15-12:30 P	0	0	0	0	0	0	0
12:30-12:45 P	0	0	0	0	0	0	0
12:45-1:00 P	0	0	0	0	0	0	0
1:00-1:15 P	0	0	0	0	0	0	0
1:15-1:30 P	0	0	0	0	0	0	0
1:30-1:45 P	0	0	0	0	0	0	0
1:45-2:00 P	0	0	0	0	0	0	0
2:00-2:15 P	0	0	0	0	0	0	0
2:15-2:30 P	0	0	0	0	0	0	0
2:30-2:45 P	0	0	0	0	0	0	0
2:45-3:00 P	0	0	0	0	0	0	0
3:00-3:15 P	0	0	0	0	0	0	0
3:15-3:30 P	0	0	0	0	0	0	0
3:30-3:45 P	0	0	0	0	0	0	0
3:45-4:00 P	0	0	0	0	0	0	0
4:00-4:15 P	0	0	0	0	0	0	0
4:15-4:30 P	0	0	0	0	0	0	0
4:30-4:45 P	0	0	0	0	0	0	0
4:45-5:00 P	0	0	0	0	0	0	0
5:00-5:15 P	0	0	0	0	0	0	0
5:15-5:30 P	0	0	0	0	0	0	0
5:30-5:45 P	0	0	0	0	0	0	0
5:45-6:00 P	0	0	0	0	0	0	0
6:00-6:15 P	0	0	0	0	0	0	0
6:15-6:30 P	0	0	0	0	0	0	0
6:30-6:45 P	0	0	0	0	0	0	0
6:45-7:00 P	0	0	0	0	0	0	0
7:00-7:15 P	0	0	0	0	0	0	0
7:15-7:30 P	0	0	0	0	0	0	0
7:30-7:45 P	0	0	0	0	0	0	0
7:45-8:00 P	0	0	0	0	0	0	0
8:00-8:15 P	0	0	0	0	0	0	0
8:15-8:30 P	0	0	0	0	0	0	0
8:30-8:45 P	0	0	0	0	0	0	0
8:45-9:00 P	0	0	0	0	0	0	0
9:00-9:15 P	0	0	0	0	0	0	0
9:15-9:30 P	0	0	0	0	0	0	0
9:30-9:45 P	0	0	0	0	0	0	0
9:45-10:00 P	0	0	0	0	0	0	0
10:00-10:15 P	0	0	0	0	0	0	0
10:15-10:30 P	0	0	0	0	0	0	0
10:30-10:45 P	0	0	0	0	0	0	0
10:45-11:00 P	0	0	0	0	0	0	0
11:00-11:15 P	0	0	0	0	0	0	0
11:15-11:30 P	0	0	0	0	0	0	0
11:30-11:45 P	0	0	0	0	0	0	0
11:45-12:00 P	0	0	0	0	0	0	0
12:00-12:15 P	0	0	0	0	0	0	0
12:15-12:30 P	0	0	0	0	0	0	0
12:30-12:45 P	0	0	0	0	0	0	0
12:45-1:00 P	0	0	0	0	0	0	0
1:00-1:15 P	0	0	0	0	0	0	0
1:15-1:30 P	0	0	0	0	0	0	0
1:30-1:45 P	0	0	0	0	0	0	0
1:45-2:00 P	0	0	0	0	0	0	0
2:00-2:15 P	0	0	0	0	0	0	0
2:15-2:30 P	0	0	0	0	0	0	0
2:30-2:45 P	0	0	0	0	0	0	0
2:45-3:00 P	0	0	0	0	0	0	0
3:00-3:15 P	0	0	0	0	0	0	0
3:15-3:30 P	0	0	0	0	0	0	0
3:30-3:45 P	0	0	0	0	0	0	0
3:45-4:00 P	0	0	0	0	0	0	0
4:00-4:15 P	0	0	0	0	0	0	0
4:15-4:30 P	0	0	0	0	0	0	0
4:30-4:45 P	0	0	0	0	0	0	0
4:45-5:00 P	0	0	0	0	0	0	0
5:00-5:15 P	0	0	0	0	0	0	0
5:15-5:30 P	0	0	0	0	0	0	0
5:30-5:45 P	0	0	0	0	0	0	0
5:45-6:00 P	0	0	0	0	0	0	0
6:00-6:15 P	0	0	0	0	0	0	0
6:15-6:30 P	0	0	0	0	0	0	0
6:30-6:45 P	0	0	0	0	0	0	0
6:45-7:00 P	0	0	0	0	0	0	0
7:00-7:15 P	0	0	0	0	0	0	0
7:15-7:30 P	0	0	0	0	0	0	0
7:30-7:45 P	0	0	0	0	0	0	0
7:45-8:00 P	0	0	0	0	0	0	0
8:00-8:15 P	0	0	0	0	0	0	0
8:15-8:30 P	0	0	0	0	0	0	0
8:30-8:45 P	0	0	0	0	0	0	0
8:45-9:00 P	0	0	0	0	0	0	0
9:00-9:15 P	0	0	0	0	0	0	0
9:15-9:30 P	0	0	0	0	0	0	0
9:30-9:45 P	0	0	0	0	0	0	0
9:45-10:00 P	0	0	0	0	0	0	0
10:00-10:15 P	0	0	0	0	0	0	0
10:15-10:30 P	0	0	0	0	0	0	0
10:30-10:45 P	0	0	0	0	0	0	0
10:45-11:00 P	0	0	0	0	0	0	0
11:00-11:15 P	0	0	0	0	0	0	0
11:15-11:30 P	0	0	0	0	0	0	0
11:30-11:45 P	0	0	0	0	0	0	0
11:45-12:00 P	0	0	0	0	0	0	0
12:00-12:15 P	0	0	0	0	0	0	0
12:15-12:30 P	0	0	0	0	0	0	0
12:30-12:45 P	0	0	0	0	0	0	0
12:45-1:00 P	0	0	0	0	0	0	0
1:00-1:15 P	0	0	0	0	0	0	0
1:15-1:30 P	0	0	0	0	0	0	0
1:30-1:45 P	0	0	0	0	0	0	0
1:45-2:00 P	0	0	0	0	0	0	0
2:00-2:15 P	0	0	0	0	0	0	0
2:15-2:30 P	0	0	0	0	0	0	0
2:30-2:45 P	0	0	0	0	0	0	0
2:45-3:00 P	0	0	0	0	0	0	0
3:00-3:15 P	0	0	0	0	0	0	0
3:15-3:30 P	0	0	0	0	0	0	0
3:30-3:45 P	0	0	0	0	0	0	0
3:45-4:00 P	0	0	0	0	0	0	0
4:00-4:15 P	0	0	0	0	0	0	0
4:15-4:30 P	0	0	0	0	0	0	0
4:30-4:45 P	0	0	0	0	0	0	0
4:45-5:00 P	0	0	0	0	0	0	0
5:00-5:15 P	0	0	0	0	0	0	0
5:15-5:30 P	0	0	0	0	0	0	0
5:30-5:45 P	0	0	0	0	0	0	0
5:45-6:00 P	0	0	0	0	0	0	

[illegible]

Total	24	405	32	234	0	0	0	4	319	275	0	1	0	342	71	1678
Approval			671				0		564					413		1678
%AV			3.6%				0%		0.7%					0.2%		1.7%
DATE			0.03				0.03		0.06					0.03		0.04





Prepared for: **SCJ Alliance**
Traffic Count Consultants, Inc.
Phone: (253) 926-0099 FAX: (253) 922-7211 E-Mail: Team@TC2Inc.com
WEB/DRE

Intersection: I-5 NB Ramps & Turnwater Blvd

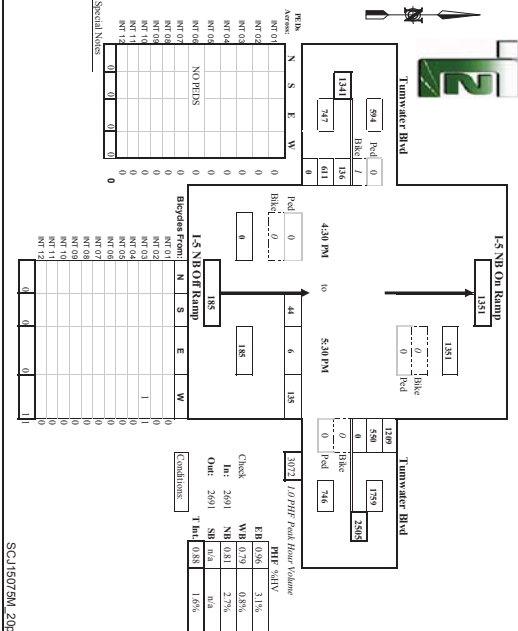
Date of Count: Wed 6/24/2015

Location: Turnwater, Washington

Checked By: Jee

Time	From North on (SB)	From South on (NB)	From East on (WB)	From West on (EB)	Interval
Interval	T L S R	T L S R	T L S R	T L S R	Total
4:15 P	0 0 0 0	1 106 1 21	3 0 112 258	7 19 161 0	577
4:30 P	0 0 0 0	4 13 5 23	3 0 167 197	4 58 177 0	520
4:45 P	0 0 0 0	1 16 1 34	6 0 140 199	1 44 149 0	793
5:00 P	0 0 0 0	2 6 2 29	3 0 114 252	10 28 164 0	595
5:15 P	0 0 0 0	1 5 2 33	1 0 177 383	6 25 143 0	768
5:30 P	0 0 0 0	1 17 1 39	4 0 169 215	6 39 155 0	575
5:45 P	0 0 0 0	1 9 2 31	4 0 116 191	2 40 134 0	418
6:00 P	0 0 0 0	1 12 1 25	2 0 79 131	9 41 129 0	418
6:15 P	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0
6:30 P	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0
6:45 P	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0
7:00 P	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0
Total	0 0 0 0	12 88 15 215	26 0 964 1981	45 274 1172 0	4729
Survey	0 0 0 0	12 88 15 215	26 0 964 1981	45 274 1172 0	4729

Approach	Total	Peak Hour: 4:30 PM										to 5:30 PM				Interval	
SAIV	0	0	0	0	5	44	6	135	14	0	550	1209	23	136	611	0	2691
PHI	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
PHI	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%



Prepared for: **SCJ Alliance**
Traffic Count Consultants, Inc.
Phone: (253) 926-0099 FAX: (253) 922-7211 E-Mail: Team@TC2Inc.com
WEB/DRE

Intersection: Linderson Way SW & Turnwater Blvd SW

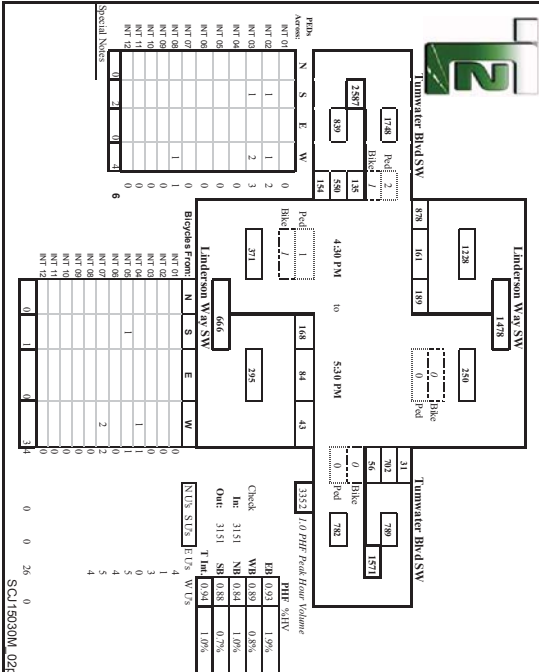
Date of Count: Tues 3/03/2015

Location: Turnwater, Washington

Checked By: Jee

Time	From North on (SB)	From South on (NB)	From East on (WB)	From West on (EB)	Interval
Interval	T L S R	T L S R	T L S R	T L S R	Total
4:15 P	6 41 27 18	0 34 9 13	1 11 164 123	9 28 133 30	640
4:30 P	2 32 18 74	1 19 11 11	4 5 126 7	13 39 129 47	571
4:45 P	4 55 27 64	2 49 20 13	0 16 185 9	4 23 131 29	825
5:00 P	1 39 38 171	1 48 28 12	2 10 141 8	6 41 138 46	720
5:15 P	1 61 27 241	0 42 13 8	2 15 196 10	3 36 129 41	818
5:30 P	2 34 69 178	0 29 23 10	2 15 180 4	2 35 157 38	768
5:45 P	2 40 25 186	3 48 28 14	0 13 170 8	1 21 127 25	651
6:00 P	1 16 13 65	1 21 11 12	0 12 119 3	3 24 128 27	449
6:15 P	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0
6:30 P	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0
6:45 P	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0
7:00 P	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0
Total	19 318 242 1346	8 290 143 93	11 1233 61	42 247 1067 281	5462
Survey	19 318 242 1346	8 290 143 93	11 1233 61	42 247 1067 281	5462

Approach	Total	Peak Hour: 4:30 PM	to	5:30 PM	Interval
Approach	8 180 161 878	3 168 84 43	6 56 702 31	16 135 550 154	3151
SAIV	1228	250	789	839	3151
PHI	0.7%	14.0%	0.8%	1.0%	1.0%
PHI	0.8%	0.8%	0.8%	0.8%	0.8%





Prepared for: **SCJ Alliance**
Traffic Count Consultants, Inc.

Phone: (253) 926-6099 FAX: (253) 922-2711 E-Mail: Team@TCCinc.com

WB/DRE

Intersection: New Market SW & Turnwater Blvd SW

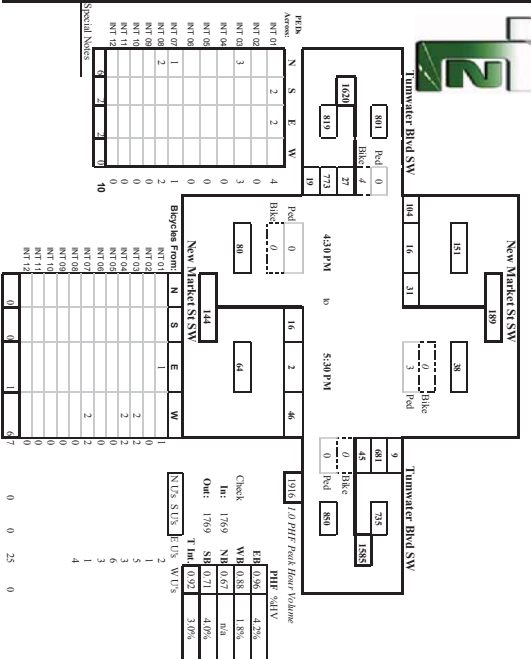
Date of Count: Tues 3/03/2015

Location: Turnwater, Washington

Checked By: Jess

Time	From North on (SB)				From South on (NB)				From East on (WB)				From West on (EB)				Interval	Total
Interval	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R		
4:15 P	0	1	1	1	10	1	3	0	10	3	3	174	1	5	8	176	2	389
4:30 P	0	1	1	7	1	0	1	3	4	7	134	1	6	2	153	4	314	
4:45 P	1	3	0	14	0	7	1	16	0	12	189	0	9	5	197	3	447	
5:00 P	0	5	4	24	0	5	1	10	5	12	133	1	5	3	157	6	392	
5:15 P	4	12	4	31	0	2	0	17	1	12	193	3	14	13	164	6	479	
5:30 P	1	10	8	35	0	2	0	3	7	9	166	5	5	6	205	4	451	
5:45 P	1	4	3	33	1	3	0	7	3	10	160	2	2	2	178	6	405	
6:00 P	0	2	0	12	1	5	0	4	3	3	123	3	7	2	168	2	324	
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total	7	39	21	166	4	27	3	70	26	68	1272	16	54	41	1445	33	3201	
Survey	Peak Hour: 4:30 PM to 5:30 PM																	

Total	6	31	16	104	0	16	2	46	13	45	681	9	54	27	773	19	1769
Approach	151																
%LIV	4.0%																
PIF	0.71																
	0.87																
	0.88																
	0.96																
	0.92																



Prepared for: **SCJ Alliance**
Traffic Count Consultants, Inc.

Phone: (253) 926-6099 FAX: (253) 922-2711 E-Mail: Team@TCCinc.com

WB/DRE

Intersection: Capital Blvd SE & Turnwater Blvd SE

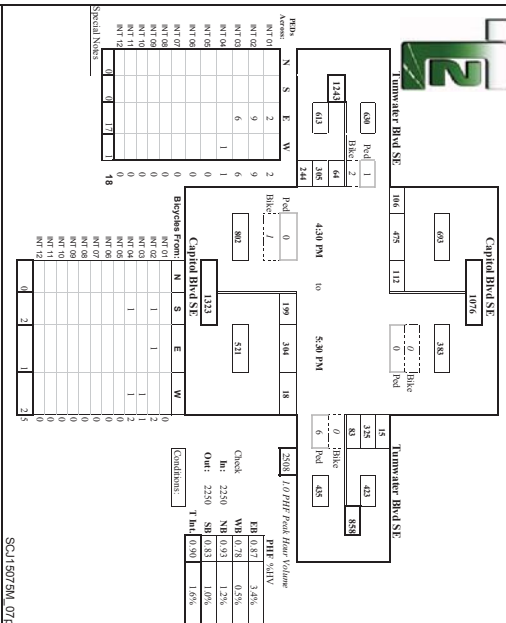
Date of Count: Wed 6/23/2015

Location: Turnwater, Washington

Checked By: Jess

Time	From North on (SB)				From South on (NB)				From East on (WB)				From West on (EB)				Interval
Interval	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	Total
4:15 P	2	16	118	19	0	54	85	3	2	12	58	1	7	19	63	59	597
4:30 P	1	11	121	23	2	54	67	4	1	12	53	3	3	24	54	42	468
4:45 P	0	37	64	33	0	53	76	5	0	24	72	1	7	17	82	78	571
5:00 P	4	16	106	19	1	47	72	3	0	14	70	5	5	20	81	62	515
5:15 P	0	33	141	36	4	53	83	4	1	28	104	4	4	13	78	50	627
5:30 P	3	26	134	18	1	47	73	6	1	17	79	5	5	14	64	54	537
5:45 P	3	23	105	28	2	67	69	1	4	14	57	2	3	10	61	52	489
6:00 P	7	20	85	14	1	50	75	3	1	10	45	8	3	7	39	43	399
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	20	182	904	190	11	428	600	29	10	131	518	29	37	124	522	440	4111
Survey	Peak Hour: 4:30 PM to 5:30 PM																

Total	7	112	473	106	6	199	304	18	2	83	325	15	21	64	305	24	2250
Approach	1506																
%LIV	1.2%																
PIF	0.83																
	0.78																
	0.87																





Prepared for: **SCJ Alliance**
Traffic Count Consultants, Inc.
Phone: (253) 924-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com
WBE/DBE

Intersection: Wadsworth St/SR65th Ave SE & Henderson Blvd SE

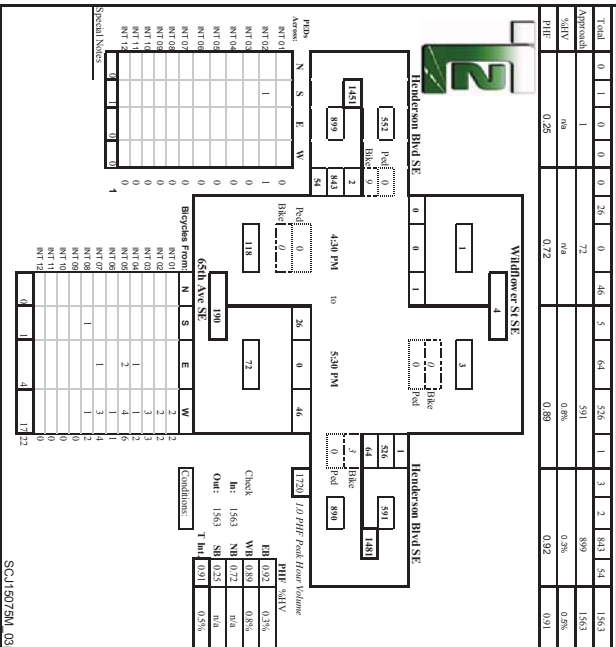
Location: Tumwater, Washington

Date of Count: Wed 7/01/2015

Checked By: Jess

Time Interval	From North on (SB)	From South on (NB)	From East on (WB)	From West on (EB)	Interval Total
4:15 P	0	0	0	0	0
4:30 P	0	0	0	0	0
4:45 P	0	0	0	0	0
5:00 P	0	0	0	0	0
5:15 P	0	0	0	0	0
5:30 P	0	0	0	0	0
5:45 P	0	0	0	0	0
6:00 P	0	0	0	0	0
6:15 P	0	0	0	0	0
6:30 P	0	0	0	0	0
6:45 P	0	0	0	0	0
7:00 P	0	0	0	0	0
Total	0	0	0	0	0
Survey	0	0	0	0	0

Peak Hour: 4:30 PM to 5:30 PM	Total	Survey
Total	0	0
Approach	0	0
SAIV	0	0
PIR	0	0



Prepared for: **City of Tumwater**
Traffic Count Consultants, Inc.
Phone: (253) 924-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com
WBE/DBE

Intersection: Henderson Blvd SE & Tumwater Blvd SE

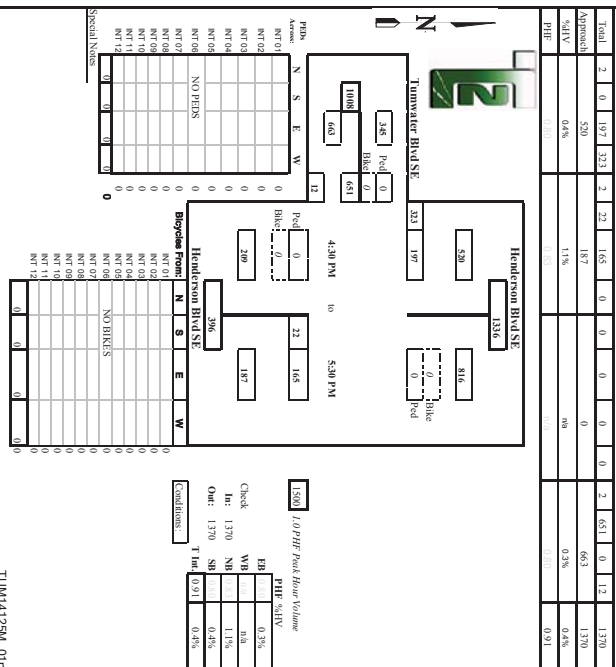
Location: Tumwater, Washington

Date of Count: Thurs 11/13/2014

Checked By: Jess

Time Interval	From North on (SB)	From South on (NB)	From East on (WB)	From West on (EB)	Interval Total
4:15 P	2	0	0	0	2
4:30 P	3	0	0	0	3
4:45 P	2	0	0	0	2
5:00 P	0	0	0	0	0
5:15 P	0	0	0	0	0
5:30 P	0	0	0	0	0
5:45 P	1	0	0	0	1
6:00 P	0	0	0	0	0
6:15 P	0	0	0	0	0
6:30 P	0	0	0	0	0
6:45 P	0	0	0	0	0
7:00 P	0	0	0	0	0
Total	8	0	0	0	8
Survey	8	0	0	0	8

Peak Hour: 4:30 PM to 5:30 PM	Total	Survey
Total	2	8
Approach	2	8
SAIV	0.4%	11%
PIR	0.0%	0.91





Prepared for:
SCJ Alliance
Traffic Count Consultants, Inc.

Phone: (253) 924-6099 FAX: (253) 922-7211 E-Mail: Tam@TCCinc.com

WB: DBE

Intersection: Table End Dr SE & Henderson Blvd SE

Location: Tumwater, Washington

Date of Count: Wed 6/24/2015

Checked By: Jess

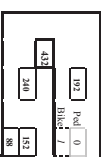
Time Interval	From North on (SB)	From South on (NB)	From East on (WB)	From West on (EB)	Interval Total
Leading #	T L S R	T L S R	T L S R	T L S R	
4:15 P	0 0 0 0	0 0 0 0	22 3 15 37	0 1 0 24	118
4:30 P	0 0 0 0	0 0 0 7	10 1 16 31	0 0 0 35	112
4:45 P	0 0 0 0	0 0 0 5	9 0 19 29	0 0 0 31	104
5:00 P	0 0 0 0	0 0 10 0	14 0 15 32	0 0 0 35	123
5:15 P	0 0 0 0	0 0 13 0	12 1 34 35	0 0 0 54	167
5:30 P	0 0 0 0	0 0 9 0	11 0 29 39	0 1 0 78	149
5:45 P	0 0 0 0	0 20 0	22 0 14 30	0 0 0 40	135
6:00 P	0 0 0 0	0 11 0	7 0 20 35	0 1 0 30	126
6:15 P	0 0 0 0	0 0 0	0 0 0 0	0 0 0 0	0
6:30 P	0 0 0 0	0 0 0	0 0 0 0	0 0 0 0	0
6:45 P	0 0 0 0	0 0 0	0 0 0 0	0 0 0 0	0
7:00 P	0 0 0 0	0 0 0	0 0 0 0	0 0 0 0	0
Total	0 0 0 0	83 0	107 5	162 3	277 141
Survey	0 0 0 0	83 0	107 5	162 3	277 141

Peak Hour: 5:00 PM to 6:00 PM																
Total	0	0	0	0	83	0	107	5	162	268	0	3	0	277	141	1038
Survey	0	0	0	0	83	0	107	5	162	268	0	3	0	277	141	1038

Total	0	0	0	0	53	0	52	1	97	139	0	2	0	152	88	581
Approach	0				105				236			240				581
%DIV					0%				0.4%			0.8%				0.8%
PHF					0.63				0.66			0.82				0.87



Henderson Blvd SE



Time Interval	From North on (SB)	From South on (NB)	From East on (WB)	From West on (EB)	Interval Total
Leading #	T L S R	T L S R	T L S R	T L S R	
4:15 P	0 0 0 0	0 0 0 0	22 3 15 37	0 1 0 24	118
4:30 P	0 0 0 0	0 0 0 7	10 1 16 31	0 0 0 35	112
4:45 P	0 0 0 0	0 0 0 5	9 0 19 29	0 0 0 31	104
5:00 P	0 0 0 0	0 0 10 0	14 0 15 32	0 0 0 35	123
5:15 P	0 0 0 0	0 0 13 0	12 1 34 35	0 0 0 54	167
5:30 P	0 0 0 0	0 0 9 0	11 0 29 39	0 1 0 78	149
5:45 P	0 0 0 0	0 20 0	22 0 14 30	0 0 0 40	135
6:00 P	0 0 0 0	0 11 0	7 0 20 35	0 1 0 30	126
6:15 P	0 0 0 0	0 0 0	0 0 0 0	0 0 0 0	0
6:30 P	0 0 0 0	0 0 0	0 0 0 0	0 0 0 0	0
6:45 P	0 0 0 0	0 0 0	0 0 0 0	0 0 0 0	0
7:00 P	0 0 0 0	0 0 0	0 0 0 0	0 0 0 0	0
Total	0 0 0 0	83 0	107 5	162 3	277 141
Survey	0 0 0 0	83 0	107 5	162 3	277 141

INT 06			2	2
INT 08				
INT 10				
INT 11				
INT 12				

SCJ15075M_450



Prepared for:
SCJ Alliance
Traffic Count Consultants, Inc.

Phone: (253) 924-6099 FAX: (253) 922-7211 E-Mail: Tam@TCCinc.com

WB: DBE

Intersection: Little Rock Rd SW & Black Hills Hwy School Drwy

Location: Tumwater, Washington

Date of Count: Wed 6/24/2015

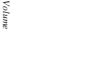
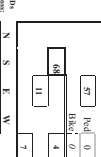
Checked By: Jess

Time Interval	From North on (SB)	From South on (NB)	From East on (WB)	From West on (EB)	Interval Total
Leading #	T L S R	T L S R	T L S R	T L S R	
4:15 P	1 0 0 0	88 3 1 1	39 0 0 0	0 0 0 1	132
4:30 P	0 0 0 0	97 15 0 3	38 0 0 0	0 0 0 1	158
4:45 P	1 0 0 0	92 16 0 2	47 0 0 0	0 0 0 1	160
5:00 P	0 0 0 0	83 15 0 2	42 0 0 0	0 0 0 0	144
5:15 P	0 0 0 0	108 6 0 1	35 0 0 0	0 0 2 0	153
5:30 P	0 0 0 0	107 11 1 4	34 0 0 0	0 0 1 0	159
5:45 P	0 0 0 0	94 10 1 2	48 0 0 0	0 0 1 0	155
6:00 P	1 0 0 0	80 17 0 2	35 0 0 0	0 0 4 0	140
6:15 P	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0
6:30 P	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0
6:45 P	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0
7:00 P	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0
Total	3 0	748 93 3 17	318 0 0 0	2 13 0 11	1201
Survey	3 0	748 93 3 17	318 0 0 0	2 13 0 11	1201

Total																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
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Black Hills H.S. Drwy



Time Interval	From North on (SB)	From South on (NB)	From East on (WB)	From West on (EB)	Interval Total
Leading #	T L S R	T L S R	T L S R	T L S R	
4:15 P	1 0 0 0	88 3 1 1	39 0 0 0	0 0 0 1	132
4:30 P	0 0 0 0	97 15 0 3	38 0 0 0	0 0 0 1	158
4:45 P	1 0 0 0	92 16 0 2	47 0 0 0	0 0 0 1	160
5:00 P	0 0 0 0	83 15 0 2	42 0 0 0	0 0 0 0	144
5:15 P	0 0 0 0	108 6 0 1	35 0 0 0	0 0 2 0	153
5:30 P	0 0 0 0	107 11 1 4	34 0 0 0	0 0 1 0	159
5:45 P	0 0 0 0	94 10 1 2	48 0 0 0	0 0 1 0	155
6:00 P	1 0 0 0	80 17 0 2	35 0 0 0	0 0 4 0	140
6:15 P	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0
6:30 P	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0
6:45 P	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0
7:00 P	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0
Total	3 0	748 93 3 17	318 0 0 0	2 13 0 11	1201
Survey	3 0	748 93 3 17	318 0 0 0	2 13 0 11	1201

IN 10					0
IN 11					0
IN 12					0
IN 13					0
IN 14					0
IN 15					0
IN 16					0
IN 17					0
IN 18					0
IN 19					0
IN 20					0
IN 21					0
IN 22					0
IN 23					0
IN 24					0
IN 25					0
IN 26					0
IN 27					0
IN 28					0
IN 29					0
IN 30					0
IN 31					0
IN 32					0
IN 33					0
IN 34					0
IN 35					0
IN 36					0
IN 37					0
IN 38					0
IN 39					0
IN 40					0
IN 41					0
IN 42					0
IN 43					0
IN 44					0
IN 45					0
IN 46					0
IN 47					0
IN 48					0
IN 49					0
IN 50					0
IN 51					0
IN 52					0
IN 53					0
IN 54					0
IN 55					0
IN 56					0
IN 57					0
IN 58					0
IN 59					0
IN 60					0
IN 61					0
IN 62					0
IN 63					0
IN 64					0
IN 65					0
IN 66					0
IN 67					0
IN 68					0
IN 69					0
IN 70					0
IN 71					0
IN 72					0
IN 73					0
IN 74					0
IN 75					0
IN 76					0
IN 77					0
IN 78					0
IN 79					0
IN 80					0
IN 81					0
IN 82					0
IN 83					0
IN 84					0
IN 85					0
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IN 87					0
IN 88					0
IN 89					0
IN 90					0
IN 91					0
IN 92					0
IN 93					0
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IN 97					0
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SCJ15075M_140

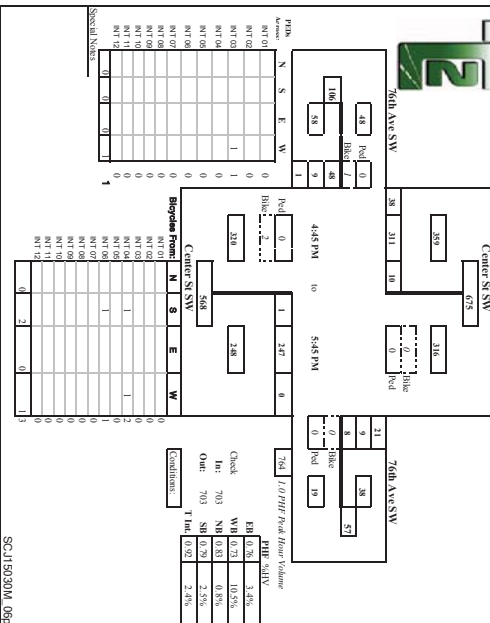


Prepared for: **SCJ Alliance**
Traffic Count Consultants, Inc.
Phone: (253) 925-5009 FAX: (253) 925-7211 E-Mail: Team@CCINC.com
WBE/DBE

Intersection: Center St SW & 766 Ave SW
Location: Tumwater, Washington
Date of Count: Tues 3/6/2015
Checked By: Jss

Time	From North on (SB)	From South on (NB)	From East on (WB)	From West on (EB)	Interval
Interval	Old Hwy 99 SE	Old Hwy 99 SE	Henderson Blvd SE	Airport Drwy	Total
4:15 P	1	1	1	1	4
4:30 P	1	1	1	1	4
4:45 P	1	1	1	1	4
5:00 P	1	1	1	1	4
5:15 P	1	1	1	1	4
5:30 P	1	1	1	1	4
5:45 P	1	1	1	1	4
6:00 P	1	1	1	1	4
6:15 P	1	1	1	1	4
6:30 P	1	1	1	1	4
6:45 P	1	1	1	1	4
7:00 P	1	1	1	1	4
Total	31	31	31	31	124
Survey	15	15	15	15	60
Approach	330	330	330	330	1320
SAIV	0.25	0.25	0.25	0.25	1.00
PHI	0.75	0.75	0.75	0.75	3.00

Time	From North on (SB)	From South on (NB)	From East on (WB)	From West on (EB)	Interval
Interval	Old Hwy 99 SE	Old Hwy 99 SE	Henderson Blvd SE	Airport Drwy	Total
4:15 P	1	1	1	1	4
4:30 P	1	1	1	1	4
4:45 P	1	1	1	1	4
5:00 P	1	1	1	1	4
5:15 P	1	1	1	1	4
5:30 P	1	1	1	1	4
5:45 P	1	1	1	1	4
6:00 P	1	1	1	1	4
6:15 P	1	1	1	1	4
6:30 P	1	1	1	1	4
6:45 P	1	1	1	1	4
7:00 P	1	1	1	1	4
Total	31	31	31	31	124
Survey	15	15	15	15	60
Approach	330	330	330	330	1320
SAIV	0.25	0.25	0.25	0.25	1.00
PHI	0.75	0.75	0.75	0.75	3.00

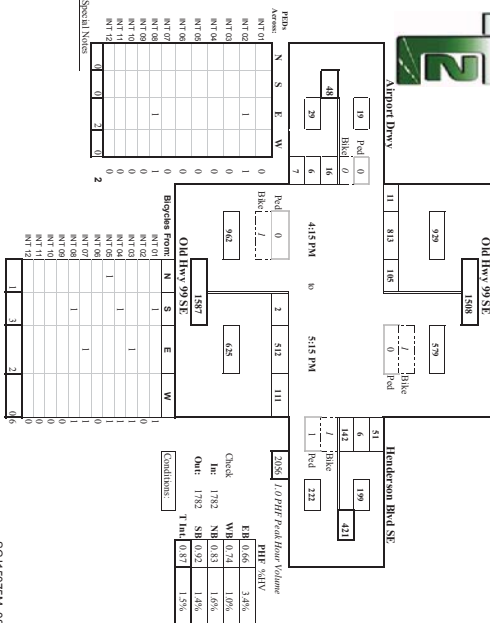


Prepared for: **SCJ Alliance**
Traffic Count Consultants, Inc.
Phone: (253) 925-5009 FAX: (253) 925-7211 E-Mail: Team@CCINC.com
WBE/DBE

Intersection: Old Hwy 99 SE & Henderson Blvd SE
Location: Tumwater, Washington
Date of Count: Tues 6/2/2015
Checked By: Jss

Time	From North on (SB)	From South on (NB)	From East on (WB)	From West on (EB)	Interval
Interval	Old Hwy 99 SE	Old Hwy 99 SE	Henderson Blvd SE	Airport Drwy	Total
4:15 P	1	1	1	1	4
4:30 P	1	1	1	1	4
4:45 P	1	1	1	1	4
5:00 P	1	1	1	1	4
5:15 P	1	1	1	1	4
5:30 P	1	1	1	1	4
5:45 P	1	1	1	1	4
6:00 P	1	1	1	1	4
6:15 P	1	1	1	1	4
6:30 P	1	1	1	1	4
6:45 P	1	1	1	1	4
7:00 P	1	1	1	1	4
Total	31	31	31	31	124
Survey	15	15	15	15	60
Approach	330	330	330	330	1320
SAIV	0.25	0.25	0.25	0.25	1.00
PHI	0.75	0.75	0.75	0.75	3.00

Time	From North on (SB)	From South on (NB)	From East on (WB)	From West on (EB)	Interval
Interval	Old Hwy 99 SE	Old Hwy 99 SE	Henderson Blvd SE	Airport Drwy	Total
4:15 P	1	1	1	1	4
4:30 P	1	1	1	1	4
4:45 P	1	1	1	1	4
5:00 P	1	1	1	1	4
5:15 P	1	1	1	1	4
5:30 P	1	1	1	1	4
5:45 P	1	1	1	1	4
6:00 P	1	1	1	1	4
6:15 P	1	1	1	1	4
6:30 P	1	1	1	1	4
6:45 P	1	1	1	1	4
7:00 P	1	1	1	1	4
Total	31	31	31	31	124
Survey	15	15	15	15	60
Approach	330	330	330	330	1320
SAIV	0.25	0.25	0.25	0.25	1.00
PHI	0.75	0.75	0.75	0.75	3.00





WB/E/DBE

Date of Count: Tues 10/28/2014

Intersection: Old Highway 99 SE & 79th Ave SE

Location: Tumwater, Washington

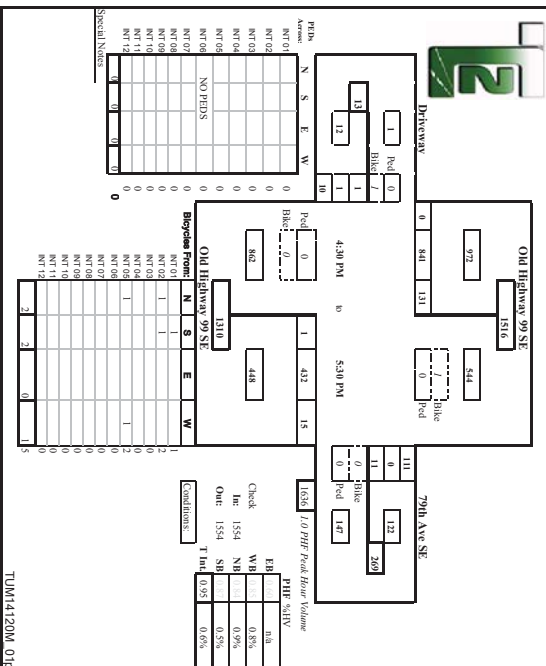
Checked By: Jey

Jess

[illegible]

Total																	
Survey	12	252	150	0	9	2	768	29	2	2.5	0	222	0	1	2	12	2883

	Peak Hour: 5:30 PM to 6:30 PM														
Total	5	131	841	0	4	1	432	15	1	11	0	1	1	16	1564
Approach			9/2				448				122			12	1584
%HV			0.0%				0.0%				0.8%			0.6%	
PHF			0.927				0.94				0.93			0.95	



TUM14120M_01p



WB/EIT

Date of Count: Tues 3/03/2011

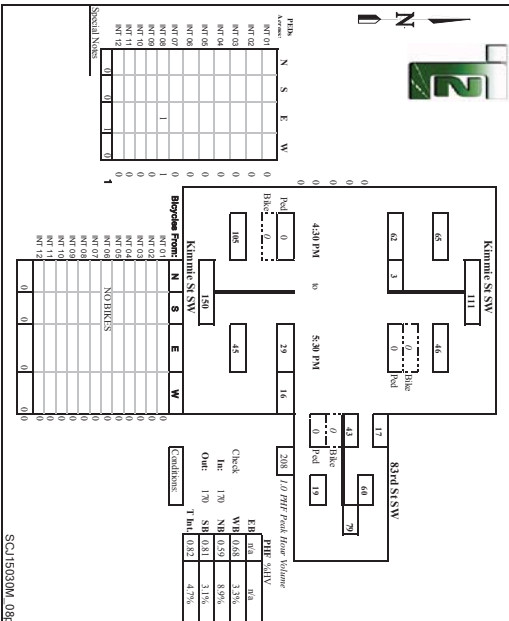
Location: Turnwater, Washington

Checked By:

Jes

[illegible][illegible]

	Peak Hour						
	4:30 PM			5:30 PM			
	2	3	4	16	2	43	170
Total	65	49	25	60	0	0	170
Approach	3%	3%	3%	0	0	0	170
%IV	0.81	0.69	0.58	0.88	0	0	0.82
PtIF							



SCJ15030M_08f



Prepared for: **SCJ Alliance**
Traffic Count Consultants, Inc.
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com
WEBDBE

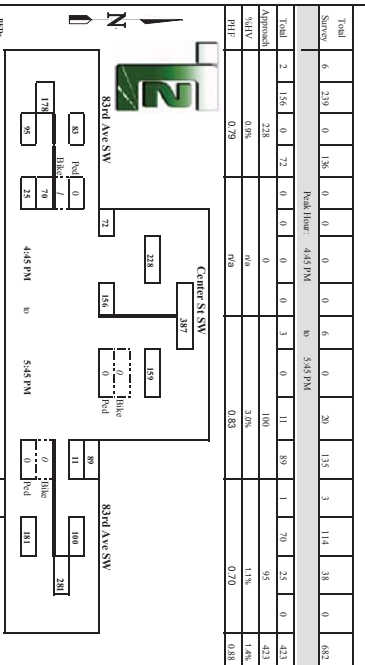
Intersection: Center St SW & 83rd Ave SW

Location: Turnover, Washington

Date of Count: Tues 3/3/2015

Checked By: Jess

Interval	From North on (SB)				From South on (NB)				From East on (WB)				From West on (EB)				Interval
	Count SB/NS				Count NB/WS				Count WB/EB				Count EB/WS				
	L	T	S	R	L	T	S	R	L	T	S	R	L	T	S	R	
4:15P	1	10	0	23	0	0	0	0	3	12	0	13	4	0	0	0	86
4:30P	0	13	0	15	0	0	0	0	0	4	9	0	10	2	0	0	51
4:45P	2	25	0	13	0	0	0	0	0	2	12	2	15	4	0	0	71
5:00P	1	31	0	16	0	0	0	0	0	0	4	17	1	28	6	0	104
5:15P	0	36	0	23	0	0	0	0	0	0	20	0	8	6	0	0	96
5:30P	1	36	0	16	0	0	0	0	2	0	4	36	0	16	2	0	120
5:45P	0	31	0	17	0	0	0	0	1	0	26	0	18	11	0	0	103
6:00P	1	15	0	13	0	0	0	0	0	0	13	0	6	3	0	0	50
6:15P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	6	239	0	136	0	0	0	6	0	20	135	3	114	38	0	682	
Survey	Peak Hour: 4:45 PM				to 5:45 PM												
Total	2	156	0	72	0	0	0	3	0	11	89	1	70	25	0	423	
Approach	228				0				100				51%				42%
SAIV	0.96				0.9				0.95				0.70				0.83
PHI	0.79				0.69				0.83				0.70				0.83



Interval	From North on (SB)				From South on (NB)				From East on (WB)				From West on (EB)				Interval
	L	T	S	R	L	T	S	R	L	T	S	R	L	T	S	R	
4:15P	1	10	0	23	0	0	0	0	3	12	0	13	4	0	0	0	80
4:30P	0	13	0	15	0	0	0	0	0	4	9	0	10	2	0	0	51
4:45P	2	25	0	13	0	0	0	0	2	12	2	15	4	0	0	71	
5:00P	1	31	0	16	0	0	0	0	0	4	17	1	28	6	0	104	
5:15P	0	36	0	23	0	0	0	0	0	20	0	8	6	0	0	96	
5:30P	1	36	0	16	0	0	0	0	2	0	4	36	0	16	2	0	120
5:45P	0	31	0	17	0	0	0	0	1	0	26	0	18	11	0	103	
6:00P	1	15	0	13	0	0	0	0	0	13	0	6	3	0	0	50	
6:15P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6:30P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6:45P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:00P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total	6	239	0	136	0	0	0	6	0	20	135	3	114	38	0	682	
Survey	Peak Hour: 4:45 PM				to 5:45 PM												
Total	2	156	0	72	0	0	0	3	0	11	89	1	70	25	0	423	
Approach	228				0				100				51%				42%
SAIV	0.96				0.9				0.95				0.70				0.83
PHI	0.79				0.69				0.83				0.70				0.83

Interval	From North on (SB)				From South on (NB)				From East on (WB)				From West on (EB)				Interval
Interval	L	T	S	R	L	T	S	R	L	T	S	R	L	T	S	R	Total
4:15P	1	10	0	23	0	0	0	0	3	12	0	13	4	0	0	0	80
4:30P	0	13	0	15	0	0	0	0	0	4	9	0	10	2	0	0	51
4:45P	2	25	0	13	0	0	0	0	2	12	2	15	4	0	0	71	
5:00P	1	31	0	16	0	0	0	0	0	4	17	1	28	6	0	104	
5:15P	0	36	0	23	0	0	0	0	0	20	0	8	6	0	0	96	
5:30P	1	36	0	16	0	0	0	0	2	0	4	36	0	16	2	0	120
5:45P	0	31	0	17	0	0	0	0	1	0	26	0	18	11	0	103	
6:00P	1	15	0	13	0	0	0	0	0	13	0	6	3	0	0	50	
6:15P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6:30P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6:45P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:00P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total	6	239	0	136	0	0	0	6	0	20	135	3	114	38	0	682	
Survey	Peak Hour: 4:45 PM				to 5:45 PM												
Total	2	156	0	72	0	0	0	3	0	11	89	1	70	25	0	423	
Approach	228				0				100				51%				42%
SAIV	0.96				0.9				0.95				0.70				0.83
PHI	0.79				0.69				0.83				0.70				0.83

SCJ16030M_09P



Prepared for: **SCJ Alliance**
Traffic Count Consultants, Inc.
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com
WEBDBE

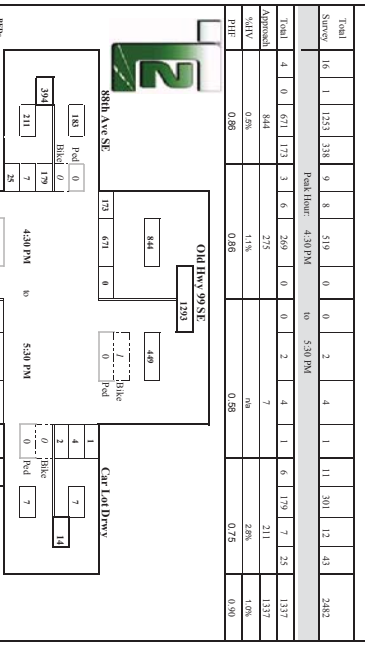
Intersection: Old Hwy 99 SE & 88th Ave SE

Location: Turnover, Washington

Date of Count: Tues 6/23/2015

Checked By: Jess

Time	From North on (SB)				From South on (NB)				From East on (WB)				From West on (EB)				Interval
Interval	L	T	S	R	L	T	S	R	L	T	S	R	L	T	S	R	Total
4:15P	5	1	144	43	4	1	65	0	0	0	0	0	3	109	3	8	384
4:30P	3	0	147	48	1	0	76	0	0	0	0	0	2	79	2	2	384
4:45P	1	0	166	33	0	2	66	0	0	0	0	0	1	53	1	2	324
5:00P	0	0	138	43	1	1	61	0	0	1	1	0	2	41	2	6	284
5:15P	3	0	172	48	2	1	79	0	0	0	0	1	0	2	56	3	371
5:30P	0	0	195	49	0	2	63	0	0	1	2	0	1	29	1	6	348
5:45P	2	0	142	42	1	1	59	0	0	0	0	0	0	28	0	4	275
6:00P	2	0	149	32	0	0	50	0	0	0	0	0	0	26	0	4	261
6:15P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	16	1	1253	338	9	8	519	0	0	2	4	1	11	301	12	43	2482
Survey	Peak Hour: 4:30 PM				to 5:30 PM												
Total	4	0	671	173	3	6	269	0	0	2	4	1	6	179	7	25	1337
Approach	844				275				7				211				1337
SAIV	0.96				0.96				0.96				0.96				0.96
PHI	0.96				0.96				0.96				0.96				0.96



COUNTS										COUNTS									
From North on (SB)					From South on (NB)					From East on (WB)					From West on (EB)				
Interval	L	T	S	R	L	T	S	R	L	T	S	R	L	T	S	R	Total		
4:15P	5	1	144	43	4	1	65	0	0	0	0	0	3	109	3	8	384		
4:30P	3	0	147	48	1	0	76	0	0	0	0	0	2	79	2	2	384		
4:45P	1	0	166	33	0	2	66	0	0	0	0	0	1	53	1	2	324		
5:00P	0	0	138	43	1	1	61	0	0	1	1	0					384		
5:15P	0	0	138	43	1	1	61	0	0	1	1	0					384		
5:30P	0	0	138	43	1	1	61	0	0	1	1	0					384		
5:45P	0	0	138	43	1	1	61	0	0	1	1	0					384		
6:00P	0	0	138	43	1	1	61	0	0	1	1	0					384		
6:15P	0	0	138	43	1	1	61	0	0	1	1	0					384		
6:30P	0	0	138	43	1	1	61	0	0	1	1	0					384		
6:45P	0	0	138	43	1	1	61	0	0	1	1	0					384		
7:00P	0	0	138	43	1	1	61	0	0	1	1	0					384		
7:15P	0	0	138	43	1	1	61	0	0	1	1	0					384		
7:30P	0	0	138	43	1	1	61	0	0	1	1	0					384		
7:45P	0	0	138	43	1	1	61	0	0	1	1	0					384		
8:00P	0	0	138	43	1	1	61	0	0	1	1	0					384		
8:15P	0	0	138	43	1	1	61	0	0	1	1	0					384		
8:30P	0	0	138	43	1	1	61	0	0	1	1	0					384		
8:45P	0	0	138	43	1	1	61	0	0	1	1	0					384		
9:00P	0	0	138	43	1	1	61	0	0	1	1	0					384		
9:15P	0	0	138	43	1	1	61	0	0	1	1	0					384		
9:30P	0	0	138	43	1	1	61	0	0	1	1	0					384		
9:45P	0	0	138	43	1	1	61	0	0	1	1	0					384		
10:00P	0	0	138	43	1	1	61	0	0	1	1	0					384		
10:15P	0	0	138	43	1	1	61	0	0	1	1	0					384		
10:30P	0	0	138	43	1	1	61	0	0	1	1	0					384		
10:45P	0	0	138	43	1	1	61	0	0	1	1	0					384		
11:00P	0	0	138	43	1	1	61	0	0	1	1	0					384		
11:15P	0	0	138	43	1	1	61	0	0	1	1	0					384		
11:30P	0	0	138	43	1	1	61	0	0	1	1	0					384		
11:45P	0	0	138	43	1	1	61	0	0	1	1	0					384		
12:00A	0	0	138	43	1	1	61	0	0	1	1	0					384		
12:15A	0	0	138	43	1	1	61	0	0	1	1	0					384		
12:30A	0	0	138	43	1	1	61	0	0	1	1	0					384		
12:45A	0	0	138	43	1	1	61	0	0	1	1	0					384		
1:00A	0	0	138	43	1	1	61	0	0	1	1	0					384		
1:15A	0	0	138	43	1	1	61	0	0	1	1	0					384		
1:30A	0	0	138	43	1	1	61	0	0	1	1	0					384		
1:45A	0	0	138	43	1	1	61	0	0	1	1	0					384		
2:00A	0	0	138	43	1	1	61	0	0	1	1	0					384		
2:15A	0	0	138	43	1	1	61	0	0	1	1	0					384		
2:30A	0	0	138	43	1	1	61	0	0	1	1	0					384		
2:45A	0	0	138	43	1	1	61	0	0	1	1	0					384		
3:00A	0	0	138	43	1	1	61	0	0	1	1	0					384		
3:15A	0	0	138	43	1	1	61	0	0	1	1	0					384		
3:30A	0	0	138	43	1	1	61	0	0	1	1	0					384		
3:45A	0	0	138	43	1	1	61	0	0	1	1	0					384		
4:00A	0	0	138	43	1	1	61	0	0	1	1	0					384		
4:15A	0	0	138	43	1	1	61	0	0	1	1	0					384		
4:30A	0	0	138	43	1	1	61	0	0	1	1	0					384		
4:45A	0	0	138	43	1	1	61	0	0	1	1	0					384		
5:00A	0	0	138	43	1	1	61	0	0	1	1	0					384		
5:15A	0	0	138	43	1	1	61	0	0	1	1	0					384		
5:30A	0	0	138	43	1	1	61	0	0	1	1	0					384		
5:45A	0	0	138	43	1	1	61	0	0	1	1	0					384		
6:00A	0	0	138	43	1	1	61	0	0	1	1	0					384		
6:15A	0	0	138	43	1	1	61	0	0	1	1	0					384		
6:30A	0	0	138	43	1	1	61	0	0	1	1	0					384		
6:45A	0	0	138	43	1	1	61	0	0	1	1	0					384		
7:00A	0	0	138	43	1	1	61	0	0	1	1	0					384		
7:15A	0	0	138	43	1	1	61	0	0	1	1	0					384		
7:30A	0	0	138	43	1	1	61	0	0	1	1	0					384		
7:45A	0	0	138	43	1	1	61	0	0	1	1	0					384		
8:00A	0	0	138	43	1	1	61	0	0	1	1	0					384		
8:15A	0	0	138	43	1	1	61	0	0	1	1	0					384		
8:30A	0	0	138	43	1	1	61	0	0	1	1	0					384		
8:45A	0	0	138	43	1	1	61	0	0	1	1	0					384		
9:00A	0	0	138	43	1	1	61	0	0	1	1	0					384		
9:15A	0	0	138	43	1	1	61	0	0	1	1	0					384		
9:30A	0	0	138	43	1	1	61	0	0	1	1	0					384		
9:45A	0	0	138	43	1	1	61	0	0	1	1	0					384		
10:00A	0	0	138	43	1	1	61	0	0	1	1	0					384		
10:15A	0	0	138	43	1	1	61	0	0	1	1	0					384		
10:30A	0	0	138	43	1	1	61	0	0	1	1	0					384		
10:45A	0	0	138	43	1	1	61	0	0	1	1	0					384		
11:00A	0	0	138	43	1	1	61	0	0	1	1	0					384		
11:15A	0	0	138	43	1	1	61	0	0	1	1	0					384		
11:30A	0	0	138	43	1	1	61	0	0	1	1	0					384		
11:45A	0	0	138	43	1	1	61	0	0	1	1	0					384		
12:00P	0	0	138	43	1	1	61	0	0	1	1	0					384		
12:15P	0	0	138	43	1	1	61	0	0	1	1	0					384		
12:30P	0	0	138	43	1	1	61	0	0	1	1	0					384		
12:45P	0	0	138	43	1	1	61	0	0	1	1	0					384		
1:00P	0	0	138	43	1	1	61	0	0	1	1	0					384		
1:15P	0	0	138	43	1	1	61	0	0	1	1	0					384		
1:30P	0	0	138	43	1	1	61	0	0	1	1	0					384		
1:45P	0	0	138	43	1	1	61	0	0	1	1	0					384		
2:00P	0	0	138	43	1	1	61	0	0	1	1	0					384		
2:15P	0	0	138	43	1	1	61	0	0	1	1	0					384		
2:30P	0	0	138	43	1	1	61	0	0	1	1	0					384		
2:45P	0	0	138	43	1	1	61	0	0	1	1	0					384		
3:00P	0	0	138	43	1	1	61	0	0	1	1	0					384		
3:15P	0	0	138	43	1	1	61	0	0	1	1	0					384		
3:30P	0	0	138	43	1	1	61	0	0	1	1	0					384		
3:45P	0	0	138	43	1	1	61	0	0	1	1	0					384		
4:00P	0	0	138	43	1	1	61	0	0	1	1	0					384		
4:15P	0	0	138	43	1	1	61	0	0	1	1	0					384		
4:30P	0	0	138	43	1	1	61	0	0	1	1	0					384		
4:45P	0	0	138	43	1	1	61	0	0	1	1	0					384		
5:00P	0	0	138	43	1	1	61	0	0	1	1	0					384		
5:15P	0	0	138	43	1	1	61	0	0	1	1	0					384		
5:30P	0	0	138	43	1	1	61	0	0	1	1	0					384		
5:45P	0	0	138	43	1	1	61	0	0	1	1	0					384		
6:00P	0	0	138	43	1	1	61	0	0	1	1	0					384		
6:15P	0	0	138	43	1	1	61	0	0	1	1	0					384		
6:30P	0	0	138	43	1	1	61	0	0	1	1	0					384		
6:45P	0	0	138	43	1	1	61	0	0										

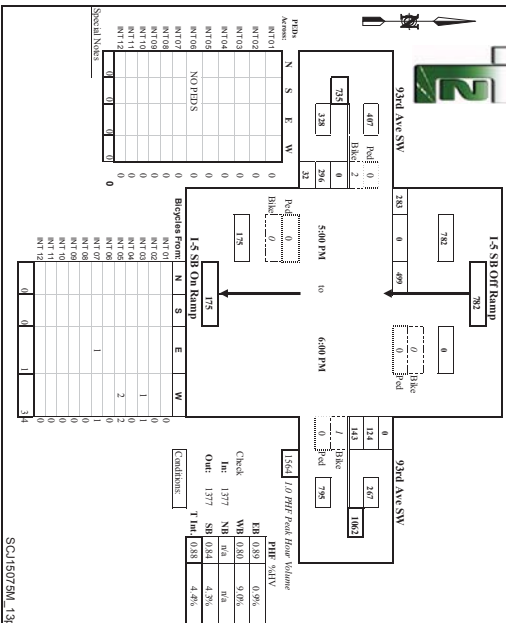


Prepared for: **SCJ Alliance**
Traffic Count Consultants, Inc.
Phone: (253) 926-6099 FAX: (253) 922-7211 E-Mail: Team@TCCinc.com
WBE/DBE

Intersection: I-5 SB Ramps & 59th Ave SW
Location: Tumwater, Washington
Date of Count: Tues 6/23/2015
Checked By: Jess

Time Interval	From North on (SB)			From South on (NB)			From East on (WB)			From West on (EB)			Interval Total
	I	L	S	I	L	S	I	L	S	I	L	S	
Leading #	T	T	S	R	T	L	S	R	T	L	S	R	
I-5 SB Off Ramp	0	0	0	0	0	0	0	0	0	0	0	0	
4:15 P	250	101	0	47	0	0	5	19	23	0	3	0	62 3 257
4:30 P	12	123	0	46	0	0	0	9	38	23	0	2	0 50 5 284
4:45 P	14	109	2	47	0	0	0	8	39	26	0	0	0 72 5 311
5:00 P	10	117	1	49	0	0	0	7	34	22	0	0	0 54 3 290
5:15 P	6	115	0	64	0	0	0	6	48	35	0	2	0 80 12 354
5:30 P	7	135	0	98	0	0	0	0	8	35	37	0	1 78 8 391
5:45 P	10	133	0	66	0	0	0	0	6	30	28	0	0 0 85 5 347
6:00 P	11	116	0	55	0	0	0	0	4	30	24	0	0 0 53 7 285
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0 0 0 0 0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0 0 0 0 0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0 0 0 0 0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0 0 0 0 0
Survey	0	0	0	0	0	0	0	0	0	0	0	0	0 0 0 0 0
Total	490	919	3	472	0	0	0	53	293	218	0	8	0 534 90 2595

Peak Hour: 5:00 PM		to 6:00 PM		Peak Hour: 5:00 PM		to 6:00 PM	
Total	34	409	0	283	0	0	0
Approach	782			0		24	143
%DIV	4.3%			0%		767	1377
PIF	0.84			0%		0.96	0.96
				0%		0.20	0.89

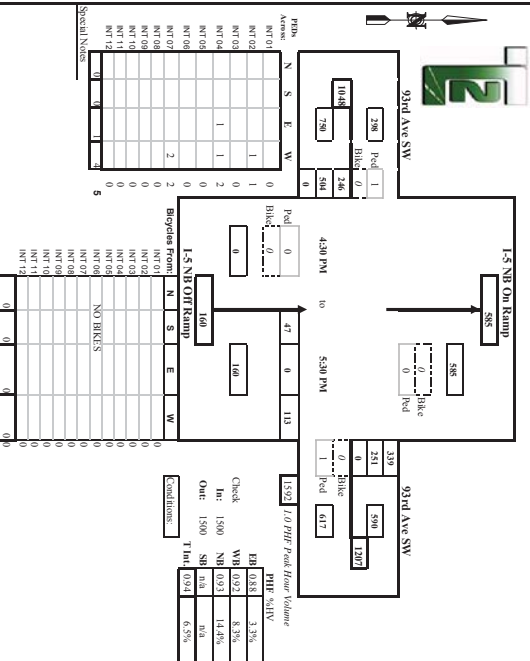


Prepared for: **SCJ Alliance**
Traffic Count Consultants, Inc.
Phone: (253) 926-6099 FAX: (253) 922-7211 E-Mail: Team@TCCinc.com
WBE/DBE

Intersection: I-5 NB Ramps & 93rd Ave SW
Location: Tumwater, Washington
Date of Count: Tues 6/23/2015
Checked By: Jess

Time Interval	From North on (SB)			From South on (NB)			From East on (WB)			From West on (EB)			Interval Total
	I	L	S	I	L	S	I	L	S	I	L	S	
I-5 NB On Ramp	T	T	S	R	T	L	S	R	T	L	S	R	
I-5 NB Off Ramp	0	0	0	0	0	0	0	0	0	0	0	0	
4:15 P	0	0	0	0	0	0	8	5	2	24	15	0	42 77 15 44 119 0 313
4:30 P	0	0	0	0	0	0	11	4	0	33	12	0	52 88 9 46 126 0 340
4:45 P	0	0	0	0	0	0	7	14	0	27	17	0	70 88 10 47 125 0 371
5:00 P	0	0	0	0	0	0	4	9	0	28	9	0	47 88 7 54 117 0 343
5:15 P	0	0	0	0	0	0	8	16	0	27	16	0	67 84 5 87 107 0 399
5:30 P	0	0	0	0	0	0	4	8	0	31	7	0	67 69 3 58 155 0 388
5:45 P	0	0	0	0	0	0	4	7	0	17	11	0	48 71 11 69 149 0 361
6:00 P	0	0	0	0	0	0	2	7	0	23	11	0	47 73 12 39 130 0 319
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0 0 0 0 0 0 0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0 0 0 0 0 0 0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0 0 0 0 0 0 0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0 0 0 0 0 0 0
Survey	0	0	0	0	0	0	0	0	0	0	0	0	0 0 0 0 0 0 0
Total	0	0	0	0	48	70	2	210	98	0	440	648	72 444 1028 0 2842

Peak Hour: 4:30 PM		to 5:30 PM		Peak Hour: 4:30 PM		to 5:30 PM	
Total	0	0	0	23	47	0	113
Approach	0			160		530	750
%DIV	0			14.4%		8.3%	3.3%
PIF	n/a			0.93		0.92	0.88





Prepared for: **SCJ Alliance**
Traffic Count Consultants, Inc.

Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TCCinc.com

WB/DRE

Intersection: Kinross St SW & 93rd Ave SW

Location: Tumwater, Washington

Date of Count: Tues 6/23/2015

Checked By: Jess

Time Interval	From North on (SB)				From South on (NB)				From East on (WB)				From West on (EB)				Interval Total			
	Kinnear (SW)				Kinnear (NE)				9th Ave SW				9th Ave SE							
Endural	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R				
4:15 P	1	3	4	6	12	0	4	0	3	1	0	0	78	0	7	13	109	3	231	
4:30 P	1	2	1	17	0	3	0	2	0	1	0	0	97	0	7	9	120	6	258	
4:45 P	0	2	0	16	0	5	0	1	1	0	0	102	0	6	6	118	0	250		
5:00 P	1	1	1	7	0	5	0	3	0	2	84	5	4	5	108	6	227	0		
5:15 P	1	0	1	8	0	2	8	0	2	1	4	3	0	125	1	2	5	116	3	267
5:30 P	1	2	2	14	0	1	2	1	0	0	2	80	1	1	15	128	4	253	0	
5:45 P	1	3	1	8	0	6	0	3	1	0	66	1	3	11	113	6	218	0		
6:00 P	2	0	3	3	0	3	1	2	1	1	72	1	2	4	117	4	211	0		
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Total	Survey	Peak Hour: 4:15 PM to 5:15 PM															
10	14	16	55	0	29	4	19	7	6	704	9	32	68	930	31	1915	
Total	3	5	4	48	0	15	1	10	4	3	408	6	19	25	465	15	1002
Approach	57										417				502		1002
%IV	5.3%										4.7%				3.8%		28%
PIF	0.71										0.81				0.83		0.94



Prepared for: **SCJ Alliance**
Traffic Count Consultants, Inc.

Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TCCinc.com

WB/DRE

Intersection: Case Rd SW & 93rd Ave SW

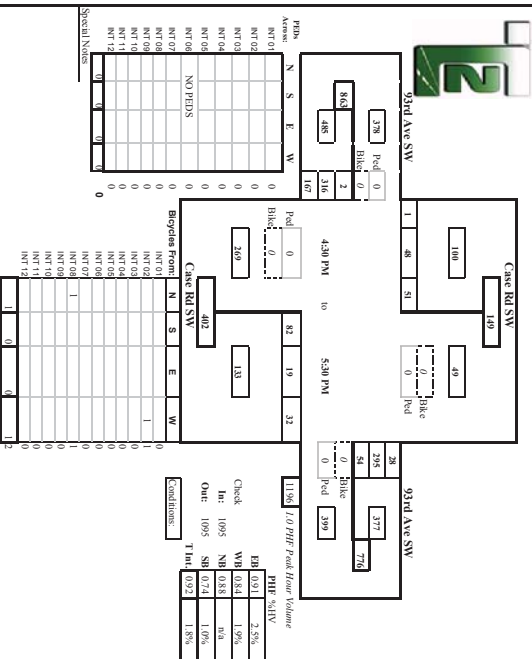
Location: Tumwater, Washington

Date of Count: Tues 6/23/2015

Checked By: Jess

Time Interval	From North on (SB)				From South on (NB)				From East on (WB)				From West on (EB)				Interval Total
	Case Rd SW				Case Rd NB				91st Ave SW				91st Ave EB				
Interval	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:30 P	1	8	9	0	2	16	1	6	1	9	69	5	9	0	73	38	224
4:45 P	0	10	7	0	0	26	2	7	0	12	75	7	6	0	69	44	259
5:00 P	0	10	10	1	0	22	4	9	1	14	73	5	5	0	77	43	268
5:15 P	1	9	8	0	0	35	5	8	0	12	65	10	2	0	72	40	254
5:30 P	0	22	12	0	0	16	6	11	3	15	62	5	3	2	76	42	269
5:45 P	0	10	18	0	0	19	4	4	3	13	65	8	2	0	91	42	274
5:50 P	0	13	12	0	0	16	4	9	0	20	51	3	1	0	70	46	244
6:00 P	0	9	9	0	0	20	4	3	0	9	40	4	1	0	81	36	215
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Total	Survey	Peak Hour: 4:30 PM to 5:30 PM															
1	91	85	1	2	169	30	57	8	104	520	47	29	2	609	331	2037	
Total	1	51	48	1	0	82	19	32	7	54	295	28	12	2	316	167	1005
Approach		100				133				377				485		1005	
%IV		100%				94%				7.8%				4.8%		4.8%	
PIF		0.74				0.88				0.84				0.91		0.92	





Prepared for: **SCJ Alliance**
Traffic Count Consultants, Inc.

Phone: (253) 926-6099 FAX: (253) 922-7211 E-Mail: Team@TCCinc.com

WB/DRE

Intersection: Tilly Rd SW (South Leg) & 93rd Ave SW

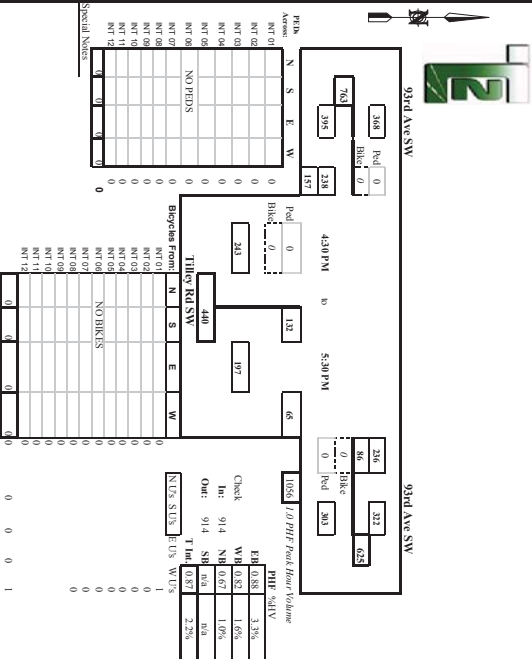
Location: Tumwater, Washington

Date of Count: Tues 6/23/2015

Checked By: Jess

Time Interval	From North on (SB)				From South on (NB)				From East on (WB)				From West on (EB)				Interval Total
	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
Leading at	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 P	0	0	0	0	0	22	0	14	1	19	49	0	10	0	40	37	190
4:30 P	0	0	0	0	0	48	0	16	0	14	53	0	5	0	51	33	215
4:45 P	0	0	0	0	1	43	0	30	0	13	42	0	4	0	45	42	223
5:00 P	0	0	0	0	0	20	0	14	0	24	45	0	3	0	49	36	204
5:15 P	0	0	0	0	0	40	0	14	3	24	74	0	3	0	79	54	264
5:30 P	0	0	0	0	1	29	0	7	2	25	55	0	3	0	56	45	217
5:45 P	0	0	0	0	0	24	0	6	0	14	51	0	1	0	46	46	187
6:00 P	0	0	0	0	0	16	0	5	0	18	35	0	1	0	59	33	166
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	2	232	0	106	6	151	424	0	30	0	443	306	1672
Survey	0	0	0	0	2	232	0	106	6	151	424	0	30	0	443	306	1672

Peak Hour: 4:30 PM to 5:30 PM																	Interval Total
Total	0	0	0	0	2	153	0	65	5	86	236	0	13	0	248	157	
Approach	0	0	0	0	197					322			395				914
%ATV	na				1.9%					1.8%			3.3%				91.4
PIF	n/a				0.87					0.82			0.88				0.87



Prepared for: **SCJ Alliance**
Traffic Count Consultants, Inc.

Phone: (253) 926-6099 FAX: (253) 922-7211 E-Mail: Team@TCCinc.com

WB/DRE

Intersection: Tilly Rd SW (North Leg) & 93rd Ave SW

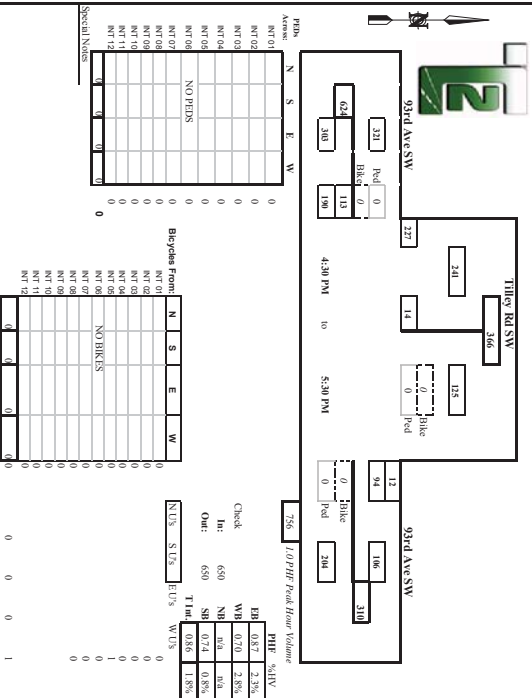
Location: Tumwater, Washington

Date of Count: Tues 6/23/2015

Checked By: Jess

Time Interval	From North on (SB)				From South on (NB)				From East on (WB)				From West on (EB)				Interval Total
	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
Leading at	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 P	1	4	0	50	0	0	0	0	0	18	5	8	22	43	0	0	143
4:30 P	1	5	0	39	0	0	0	0	1	0	26	2	3	22	38	0	132
4:45 P	0	4	0	40	0	0	0	0	0	0	15	4	2	39	45	0	147
5:00 P	0	2	0	55	0	0	0	0	0	0	35	3	3	34	36	0	165
5:15 P	1	3	0	78	0	0	0	0	2	0	18	3	2	25	62	0	189
5:30 P	1	5	0	54	0	0	0	0	1	0	26	2	0	15	47	0	149
5:45 P	0	3	0	44	0	0	0	0	0	0	22	4	0	21	34	0	128
6:00 P	0	4	0	28	0	0	0	0	0	0	23	0	1	14	53	0	122
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	4	30	0	388	0	0	0	0	4	0	183	23	19	142	358	0	1174
Survey	4	30	0	388	0	0	0	0	4	0	183	23	19	142	358	0	1174

Peak Hour: 4:30 PM to 5:30 PM																	Interval Total
Total	2	14	0	227	0	0	0	0	3	0	94	12	7	113	190	0	650
Approach	241								106				303				650
%ATV	0.8%								2.8%				2.2%				1.8%
PIF	0.74								0.70				0.87				0.86





Prepared for:
SCJ Alliance
Traffic Count Consultants, Inc.

Phone: (253) 924-6099 FAX: (253) 924-7211 E-Mail: Team@TC2inc.com

WEB: DRE

Intersection: Old Hwy 99 SE & 93rd Ave SW

Location: Tumwater, Washington

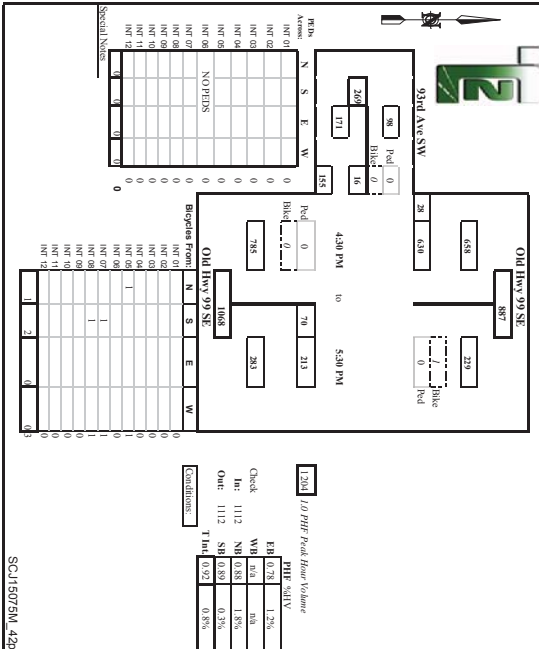
Date of Count: Tues 6/23/2015

Checked By: Jess

Time Interval	From North on (SB)				From South on (NB)				From East on (WB)				From West on (EB)				Interval Total
	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	3	0	122	3	2	12	41	0	0	0	0	0	4	4	0	31	213
4:30 P	1	0	129	10	1	20	51	0	0	0	0	0	1	7	0	26	245
4:45 P	0	0	152	6	0	14	57	0	0	0	0	0	3	0	39	271	
5:00 P	0	0	130	8	0	21	59	0	0	0	0	0	0	3	0	26	247
5:15 P	2	0	170	7	2	13	48	0	0	0	2	4	0	41	0	31	293
5:30 P	0	0	178	7	3	22	49	0	0	0	0	0	6	0	39	301	
5:45 P	1	0	121	6	1	16	52	0	0	0	0	0	4	0	25	234	
6:00 P	1	0	138	7	0	17	37	0	0	0	0	1	1	0	28	238	
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Total	8	0	1140	54	9	135	396	0	0	0	0	8	32	0	275	2023
Survey																

Peak Hour: 4:30 PM to 5:30 PM																
Total	2	0	630	28	5	70	213	0	0	0	0	2	16	0	155	1112
Approach							283								171	1112
%ADIV			0.2%				5.4%								12%	0.8%
PHF			0.89				0.88								0.78	0.92



SCJ15075M_42P

APPENDIX A-2

INTERSECTION CRASH DATA

JURISDICTION	PRIMARY TRAFFICWAY	MILE POST	BLOCK NUMBER	INTERSECTING TRAFFICWAY	DATE	TIME	MOST SEVERE INJURY TYPE	# INJ	#FAT	#VEH	#PED S	#PED AL	JUNCTION RELATIONSHIP	FIRST COLLISION TYPE / OBJECT STRUCK
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1 - R W Johnson Blvd /Mottman Rd

City Street	R W JOHNSON BLVD SW	2400		MOTTMAN RD SW	4/2/2010	11:40	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	R W JOHNSON BLVD SW	2400		MOTTMAN RD SW	9/8/2010	14:29	Possible Injury	1	0	1	0	0	At Intersection and Related	Vehicle overturned
City Street	R W JOHNSON BLVD SW	2400		MOTTMAN RD SW	11/3/2011	16:47	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - both moving - sideswipe
City Street	R W JOHNSON BLVD SW	2400		MOTTMAN RD SW	10/30/2013	14:50	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	R W JOHNSON BLVD SW	2400		MOTTMAN RD SW	6/25/2012	16:50	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	MOTTMAN RD SW	3100		R W JOHNSON BLVD SW	8/7/2014	11:58	Possible Injury	1	0	2	0	0	At Intersection and Related	Entering at angle
City Street	MOTTMAN RD SW	3200		R W JOHNSON BLVD SW	11/6/2012	16:12	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
City Street	MOTTMAN RD SW	3200		R W JOHNSON BLVD SW	11/4/2013	13:03	Evident Injury	2	0	2	0	0	At Intersection and Related	Entering at angle

2 - Crosby Blvd /Mottman Rd

City Street	CROSBY BLVD SW	1000		MOTTMAN RD SW	11/16/2011	13:00	Possible Injury	1	0	2	0	0	At Driveway within Major Intersection	Entering at angle
City Street	CROSBY BLVD SW	1000			9/9/2013	17:46	No Injury	0	0	3	0	0	Driveway Related but Not at Driveway	From same direction - both going straight - one stopped - rear-end
City Street	CROSBY BLVD SW	1000			12/26/2013	12:59	No Injury	0	0	2	0	0	At Driveway	Entering at angle
City Street	CROSBY BLVD SW	1000			6/27/2013	17:47	No Injury	0	0	2	0	0	At Driveway	From opposite direction - one left turn - one straight
City Street	CROSBY BLVD SW	1000			1/9/2014	22:50	No Injury	0	0	2	0	0	At Driveway	From same direction - one left turn - one straight
City Street	CROSBY BLVD SW	1000			6/16/2014	15:00	No Injury	0	0	1	0	0	At Driveway	Fire Hydrant
City Street	MOTTMAN RD SW	1700		CROSBY BLVD SW	10/9/2010	15:01	Evident Injury	2	0	2	0	0	At Intersection and Related	Entering at angle
City Street	MOTTMAN RD SW	1700			1/14/2010	15:51	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	MOTTMAN RD SW	1100			12/4/2014	7:51	No Injury	0	0	2	0	0	At Driveway	Entering at angle
State Route	101LX36642	0.24			11/18/2013	18:40	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
State Route	101LX36642	0.24			11/20/2013	17:50	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
State Route	101LX36642	0.24			11/3/2014	8:42	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
State Route	101LX36642	0.24			9/2/2014	16:40	Possible Injury	1	0	2	0	0	At Intersection and Related	Entering at angle
State Route	101LX36642	0.24			8/7/2014	17:10	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	101LX36642	0.24			1/23/2010	17:45	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	101LX36642	0.24			2/11/2011	12:56	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
State Route	101LX36642	0.24			12/2/2013	17:43	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	101LX36642	0.24			5/26/2010	18:59	No Injury	0	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - both moving - sideswipe
State Route	101LX36642	0.24			10/15/2011	20:05	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	101LX36642	0.24			1/19/2013	13:22	No Injury	0	0	2	0	0	At Driveway within Major Intersection	Entering at angle
State Route	101LX36642	0.24			5/10/2010	13:23	No Injury	0	0	3	0	0	At Driveway within Major Intersection	From opposite direction - one left turn - one straight
State Route	101LX36642	0.24			6/1/2012	11:39	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	101LX36642	0.24			2/19/2010	14:53	No Injury	0	0	2	0	0	At Driveway within Major Intersection	From opposite direction - one left turn - one straight
State Route	101LX36642	0.24			6/9/2012	9:15	Possible Injury	2	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	101LX36642	0.24			9/4/2012	13:17	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	101LX36642	0.24			1/13/2010	12:23	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	101LX36642	0.24			11/21/2012	16:22	Possible Injury	2	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	101LX36642	0.24			5/24/2013	16:50	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	101LX36642	0.24			2/4/2010	19:08	Evident Injury	3	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end

3 - Crosby Blvd/Irving St

City Street	CROSBY BLVD SW	1000		IRVING ST SW	3/5/2010	13:24	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CROSBY BLVD SW	2800		IRVING ST SW	6/1/2014	17:04	Possible Injury	1	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	CROSBY BLVD SW	2800		IRVING ST SW	11/22/2010	9:46	No Injury	0	0	1	0	0	At Intersection and Related	Signal Pole
City Street	CROSBY BLVD SW	2800		IRVING ST SW	11/17/2010	10:59	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CROSBY BLVD SW	2800		IRVING ST SW	7/23/2010	17:51	Possible Injury	1	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	CROSBY BLVD SW			IRVING ST SW	7/2/2014	17:09	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
City Street	CROSBY BLVD SW	2800		IRVING ST SW	10/14/2014	7:33	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	CROSBY BLVD SW	2800		IRVING ST SW	6/24/2010	20:07	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - both moving - sideswipe
City Street	CROSBY BLVD SW	2800		IRVING ST SW	12/11/2013	13:05	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
City Street	CROSBY BLVD SW	1000		IRVING ST SW	3/2/2010	16:35	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	CROSBY BLVD SW	1000		IRVING ST SW	12/11/2012	10:39	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	CROSBY BLVD SW	1000		IRVING ST SW	1/15/2013	17:09	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	CROSBY BLVD SW	2800			8/2/2010	13:41	No Injury	0	0	2	0	0	Intersection Related but Not at Intersection	From same direction - all others
City Street	CROSBY LOOP			IRVING ST SW	2/23/2011	7:17	Evident Injury	1	0	2	0	0	At Intersection and Related	From opposite direction - all others
City Street	IRVING ST SW	1500		CROSBY BLVD SW	2/21/2013	18:10	No Injury	0	0	1	0	0	At Intersection and Related	Curb, Raised Traffic Island or Raised Median Curb
City Street	IRVING ST SW	1550			6/25/2014	13:23	No Injury	0	0	2	0	0	At Driveway	From same direction - both going straight - one stopped - rear-end
City Street	IRVING ST SW				9/2/2014	15:12	No Injury	0	0	2	0	0	At Driveway	From same direction - both going straight - both moving - rear-end
City Street	IRVING ST SW				5/17/2013	14:39	No Injury	0	0	2	0	0	At Driveway	From opposite direction - one left turn - one straight
Miscellaneous Tr	SPSCC DRIVEWAY				9/25/2012	13:14	No Injury	0	0	2	0	0	Intersection Related but Not at Intersection	From same direction - both going straight - one stopped - rear-end

4 - 7th Ave/Irving St

JURISDICTION	PRIMARY TRAFFICWAY	MILE POST	BLOCK NUMBER	INTERSECTING TRAFFICWAY	DATE	TIME	MOST SEVERE INJURY TYPE	# INJ	#FAT	#VEH	#PED S	#PED AL	JUNCTION RELATIONSHIP	FIRST COLLISION TYPE / OBJECT STRUCK
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5 - Crosby Blvd/Barnes Blvd

City Street	CROSBY BLVD SW	3000	BARNES BLVD SW		10/8/2012	14:37	No Injury	0	0	2	0	0	At Driveway within Major Intersection	From same direction - both going straight - one stopped - rear-end
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6 - Black Lake Blvd/Black Lake Belmore Rd

City Street	BLACK LAKE BLVD SW	3510			3/2/2012	14:21	No Injury	0	0	2	0	0	At Driveway	Entering at angle
City Street	BLACK LAKE BLVD SW	3400			7/7/2010	14:38	No Injury	0	0	2	0	0	At Driveway	From same direction - one left turn - one straight

7 - R W Johnson Blvd /Sapp Rd

City Street	R W JOHNSON BLVD SW	4600	SAPP RD SW		8/24/2012	2:34	No Injury	0	0	1	0	0	At Intersection and Related	Tree or Stump (stationary)
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8 -Sapp Rd/Crosby Blvd

City Street	SAPP RD SW	2000	CROSBY BLVD SW		4/25/2011	6:30	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
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9 - 49th Ave/Black Lake Belmore Rd

City Street	49TH AVE SW		BLACK LAKE BELMORE RD SW		8/8/2011	19:51	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - one left turn - one straight
City Street	49TH AVE SW	3700	BLACK LAKE BELMORE RD SW		11/1/2010	15:52	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle

10 - Capitol Blvd at Carlyon Ave/Sunset Way

City Street	CAPITOL BLVD S	3100	CARLYON AVE SE		7/24/2012	12:19	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
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11 -Deschutes Way / I-5 NB On-Ramp

12 -Deschutes Way /US 101 WB On-Ramp

State Route	005P210402	0.00			7/1/2011	20:51	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
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13 -I-5/US 101 Off-Ramp at Desoto St/2nd Avenue

State Route	005R110435	0.28			2/13/2012	17:07	No Injury	0	0	2	0	0	Intersection Related but Not at Intersection	From same direction - both going straight - one stopped - rear-end
State Route	005R110435	0.29			9/25/2014	12:55	No Injury	0	0	3	0	0	Intersection Related but Not at Intersection	From same direction - both going straight - one stopped - rear-end
State Route	005R110435	0.29			10/23/2010	13:20	Possible Injury	2	0	3	0	0	Intersection Related but Not at Intersection	From same direction - both going straight - one stopped - rear-end
State Route	005R110435	0.29			1/20/2011	18:25	No Injury	0	0	3	0	0	Intersection Related but Not at Intersection	From same direction - both going straight - one stopped - rear-end
State Route	005R110435	0.30			4/19/2013	13:55	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005R110435	0.30			3/12/2013	7:01	Possible Injury	1	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
State Route	005R110435	0.30			7/6/2012	12:08	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
State Route	005R110435	0.30			7/22/2012	11:38	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005R110435	0.30			5/28/2010	13:00	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
State Route	005R110435	0.30			7/18/2014	11:05	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005R110435	0.30			10/31/2012	19:49	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
State Route	005R110435	0.30			12/12/2013	15:16	Evident Injury	2	0	2	0	0	At Intersection and Related	Entering at angle
State Route	005R110435	0.30			11/19/2012	7:01	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
State Route	005R110435	0.30			12/9/2010	7:30	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005R110435	0.30			9/30/2014	18:47	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005R110435	0.30			2/19/2014	13:51	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005R110435	0.30			6/5/2012	13:54	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
State Route	005S210373	0.22			6/3/2011	14:44	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end

14 - 2nd Ave/Custer Way

City Street	CUSTER WAY SW	100	N 2ND AVE SW		2/10/2010	7:02	Possible Injury	1	0	2	0	0	At Intersection and Related	Same direction -- both turning right -- one stopped -- rear end
City Street	CUSTER WAY SW	100	N 2ND AVE SW		7/31/2014	17:36	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	N 2 AV SW		CUSTER WY		11/2/2011	17:23	No Injury	0	0	1	0	0	At Intersection and Related	Bridge Rail - Face
City Street	N 2ND AVE SW	100	CUSTER WAY SW		10/14/2014	8:00	No Injury	0	0	1	0	0	At Intersection and Related	Curb, Raised Traffic Island or Raised Median Curb

15 - Boston St /Custer Way

City Street	CUSTER WAY SW	100	BOSTON ST SE		2/19/2012	12:48	No Injury	0	0	2	0	0	At Driveway within Major Intersection	From opposite direction - one left turn - one straight
City Street	CUSTER WAY SW	200	BOSTON ST SE		8/5/2013	21:20	Evident Injury	1	0	1	0	1	At Intersection and Related	Vehicle - Pedalcyclist
City Street	CUSTER WAY SW	200	BOSTON ST SE		5/24/2011	8:00	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CUSTER WAY SW	200	BOSTON ST SE		6/14/2012	7:51	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CUSTER WAY SW	200	BOSTON ST SE		1/21/2011	17:40	Possible Injury	1	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight

16 - Deschutes Way/Boston St

City Street	BOSTON ST SE	3600	DESCHUTES WAY SW		8/9/2013	12:25	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	BOSTON ST SE		DESCHUTES WAY SW		10/18/2011	21:09	No Injury	0	0	2	0	0	At Intersection and Related	Same direction -- both turning right -- one stopped -- sideswipe
City Street	BOSTON ST SE	3600	DESCHUTES WAY SW		4/25/2012	17:24	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - one right turn - one straight
City Street	BOSTON ST SE	3600	DESCHUTES WAY SW		7/16/2013	18:29	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	BOSTON ST SE	3600	DESCHUTES WAY SW		4/1/2014	9:31	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	BOSTON ST SE	3600			6/22/2011	17:29	No Injury	0	0	3	0	0	Intersection Related but Not at Intersection	From same direction - both going straight - one stopped - rear-end
City Street	DESCHUTES WAY SW				10/29/2011	16:49	No Injury	0	0	2	0	0	At Driveway	Entering at angle

17 - Cleveland Ave /Capitol Blvd

JURISDICTION	PRIMARY TRAFFICWAY	MILE POST	BLOCK NUMBER	INTERSECTING TRAFFICWAY	DATE	TIME	MOST SEVERE INJURY TYPE	# INJ	#FAT	#VEH	#PED S	#PED AL	JUNCTION RELATIONSHIP	FIRST COLLISION TYPE / OBJECT STRUCK
City Street	CLEVELAND AVE			CAPITOL BLVD	9/10/2014	22:33	Evident Injury	1	0	1	1	0	At Intersection and Related	Vehicle turning right hits pedestrian
City Street	CLEVELAND AVE SE		500	CAPITOL BLVD S	11/15/2013	14:15	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CLEVELAND AVE SE		500	CAPITOL BLVD S	9/4/2013	17:20	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CLEVELAND AVE SE		500	CAPITOL BLVD S	9/26/2014	18:00	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end

18 - Custer Way /Capitol Blvd

City Street	CAPITOL BLVD S		3500	CUSTER WAY SE	2/8/2014	9:47	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD S			CUSTER WAY SE	1/6/2012	6:20	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
City Street	CAPITOL BLVD S		3300	CUSTER WAY SE	8/9/2010	13:47	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
City Street	CAPITOL BLVD S		3400	CUSTER WAY SE	9/19/2014	12:40	No Injury	0	0	2	0	0	At Intersection and Related	Same direction -- both turning right -- one stopped -- rear end
City Street	CAPITOL BLVD S		3300	CUSTER WAY SW	9/22/2012	15:55	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - one right turn - one straight
City Street	CAPITOL BLVD S		3300	CUSTER WAY SW	1/22/2011	9:42	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD S			CUSTER WY SW	10/11/2011	12:08	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD S		3400		7/29/2010	15:55	No Injury	0	0	2	0	0	Intersection Related but Not at Intersection	From same direction - both going straight - one stopped - rear-end
City Street	CUSTER WAY		300	CAPITOL BLVD S	8/20/2011	15:59	No Injury	0	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - one stopped - rear-end
City Street	CUSTER WAY SE		400	CAPITOL BLVD S	9/11/2014	18:00	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - one left turn - one straight
City Street	CUSTER WAY SE		400	CAPITOL BLVD S	8/13/2013	13:09	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - one left turn - one straight
City Street	CUSTER WAY SE		400	CAPITOL BLVD S	12/18/2013	10:19	Possible Injury	1	0	3	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CUSTER WAY SE		400	CAPITOL BLVD S	5/20/2014	15:45	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CUSTER WAY SW		300	CAPITOL BLVD S	6/30/2010	7:33	No Injury	0	0	1	0	1	At Intersection and Related	Vehicle - Pedalcyclist
City Street	CUSTER WAY SW		300	CAPITOL BLVD S	9/15/2012	9:30	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - all others
City Street	CUSTER WAY SW		300	CAPITOL BLVD S	7/27/2013	14:45	Possible Injury	2	0	2	0	0	At Intersection and Related	From same direction - one left turn - one straight
City Street	CUSTER WAY SW		3500	CAPITOL BLVD S	11/25/2013	12:04	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CUSTER WAY SW		300	CAPITOL BLVD S	1/27/2013	16:50	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle

19 - Custer Way /North St at Cleveland Ave

City Street	CUSTER WAY SE		500	CLEVELAND AVE SE	10/11/2014	14:20	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - both moving - sideswipe
City Street	CUSTER WAY SE		500	CLEVELAND AVE SE	11/6/2014	17:18	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - sideswipe
City Street	CUSTER WAY SE		500	CLEVELAND AVE SE	12/22/2011	17:30	Possible Injury	1	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	CUSTER WAY SE		500	CLEVELAND AVE SE	9/10/2012	18:27	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CUSTER WAY SE		500	CLEVELAND AVE SE	12/14/2014	8:43	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
City Street	CUSTER WAY SE		500	CLEVELAND AVE SE	10/22/2012	14:01	Possible Injury	2	0	2	0	0	At Intersection and Related	Entering at angle
City Street	CUSTER WAY SE		500	CLEVELAND AVE SE	5/21/2010	8:33	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - both moving - sideswipe
City Street	CUSTER WAY SE		500		2/11/2011	12:32	No Injury	0	0	2	0	0	Intersection Related but Not at Intersection	From same direction - both going straight - one stopped - rear-end
City Street	NORTH ST SE			CLEVELAND AV SE	10/11/2011	11:40	Evident Injury	2	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	NORTH ST SE		300	CLEVELAND AVE SE	1/21/2011	7:59	Possible Injury	2	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	NORTH ST SE		200	CLEVELAND AVE SE	9/1/2011	18:06	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - sideswipe
City Street	NORTH ST SE			CLEVELAND AVE SE	3/14/2013	11:20	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	NORTH ST SE		300	CLEVELAND AVE SE	2/5/2013	16:03	Possible Injury	1	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	CLEVELAND AVE SE		500	NORTH ST	9/24/2013	17:55	No Injury	0	0	2	0	0	At Driveway within Major Intersection	Entering at angle
City Street	CLEVELAND AVE SE		400	NORTH ST SE	9/25/2013	16:01	Possible Injury	1	0	2	0	0	At Intersection and Related	Entering at angle
City Street	CLEVELAND AVE SE		200	NORTH ST SE	9/16/2011	12:19	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
City Street	CLEVELAND AVE SE		400	NORTH ST SE	10/6/2013	15:36	Possible Injury	1	0	1	1	0	At Intersection and Related	Vehicle going straight hits pedestrian
City Street	CLEVELAND AVE SE			NORTH ST SE	3/17/2012	21:15	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
City Street	CLEVELAND AVE SE		400	NORTH ST SE	8/28/2013	18:43	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight

20 - Hoody St /North St

City Street	NORTH ST SE		800		5/23/2012	16:58	No Injury	0	0	2	0	0	At Driveway	From same direction - both going straight - one stopped - rear-end
City Street	NORTH ST SE		900		11/7/2012	7:30	Possible Injury	2	0	2	0	0	At Driveway	From same direction - both going straight - one stopped - rear-end

21 - Deschutes Way / E Street / I-5 NB Off-Ramp

22 - Capitol Blvd / E St

City Street	CAPITOL BLVD S		3700	E ST SW	5/18/2014	19:12	Possible Injury	3	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD S		0	E ST SW	12/15/2011	18:02	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD S		4100	E ST SW	11/12/2014	11:03	Possible Injury	1	0	1	1	0	At Intersection and Related	Vehicle turning left hits pedestrian
City Street	CAPITOL BLVD S		4100	E ST SW	9/12/2014	12:39	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD S		3700	E ST SW	3/25/2011	14:34	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD S		3700	E ST SW	7/3/2012	14:19	Possible Injury	1	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - both moving - rear-end
City Street	E ST SW		100	CAPITOL BLVD S	5/21/2010	15:13	Possible Injury	1	0	2	0	0	At Driveway within Major Intersection	Entering at angle
City Street	E ST SW		100	CAPITOL BLVD S	5/23/2014	12:36	Possible Injury	1	0	2	0	0	At Intersection and Related	Same direction -- both turning right -- one stopped -- rear end
City Street	E ST SW		100	CAPITOL BLVD S	11/4/2013	17:39	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	E ST SW		100	CAPITOL BLVD S	8/18/2010	18:29	No Injury	0	0	2	0	0	At Driveway within Major Intersection	Entering at angle
City Street	E ST SW		4100		4/7/2010	17:01	No Injury	0	0	2	0	0	At Driveway	Entering at angle

JURISDICTION	PRIMARY TRAFFICWAY	MILE POST	BLOCK NUMBER	INTERSECTING TRAFFICWAY	DATE	TIME	MOST SEVERE INJURY TYPE	# INJ	#FAT	#VEH	#PED S	#PED AL	JUNCTION RELATIONSHIP	FIRST COLLISION TYPE / OBJECT STRUCK
23 - Cleveland Ave / South St														
City Street	CLEVELAND AVE SE		4200	SOUTH ST SE	8/25/2014	18:37	Possible Injury	1	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	SOUTH ST SE		500	CLEVELAND AVE SE	6/4/2012	19:14	Evident Injury	2	0	2	0	0	At Intersection and Related	Entering at angle
24 - 7th Ave / Linwood Ave														
City Street	LINWOOD AVE SW		400	S 7TH AVE SW	4/28/2013	21:41	Possible Injury	1	0	2	0	0	At Intersection and Related	Entering at angle
City Street	LINWOOD AVE SW		400	S 7TH AVE SW	5/7/2010	17:36	Possible Injury	2	0	2	0	0	At Intersection and Related	Entering at angle
City Street	LINWOOD AVE SW			S 7TH AVE SW	5/12/2014	16:30	Unknown	0	0	1	0	0	At Intersection and Related	Fence
25 - 2nd Ave / Linwood Ave														
City Street	LINWOOD AVE SW			S 2ND AVE SW	12/20/2013	17:24	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
City Street	LINWOOD AVE SW			S 2ND AVE SW	10/10/2012	16:08	Possible Injury	1	0	2	0	0	At Intersection and Related	Entering at angle
City Street	LINWOOD AVE SW		300	S 2ND AVE SW	11/13/2012	9:09	No Injury	0	0	3	0	0	At Intersection and Related	Entering at angle
City Street	LINWOOD AVE SW		300	S 2ND AVE SW	3/27/2014	20:30	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one right turn
City Street	S 2ND AVE SW			LINWOOD AVE SW	4/10/2014	13:19	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
City Street	S 2ND AVE SW		1000	LINWOOD AVE SW	6/27/2010	12:05	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - both moving - sideswipe
City Street	S 2ND AVE SW		1000	LINWOOD AVE SW	10/19/2013	11:21	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	S 2ND AVE SW			LINWOOD AVE SW	4/12/2011	7:48	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
City Street	S 2ND AVE SW		1000	LINWOOD AVE SW	11/25/2014	11:54	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	S 2ND AVE SW		1000	LINWOOD AVE SW	10/31/2010	11:56	Possible Injury	1	0	2	0	0	At Intersection and Related	Entering at angle
City Street	S 2ND AVE SW		1000		12/3/2013	9:40	No Injury	0	0	2	0	0	At Driveway	Entering at angle
26 - Capitol Blvd / Linwood Ave														
City Street	CAPITOL BLVD SE		4000	LINWOOD AVE SW	11/1/2013	20:14	No Injury	0	0	1	0	0	At Intersection and Related	Bridge Abutment
City Street	CAPITOL BLVD SE		4700	LINWOOD AVE SW	3/2/2012	12:17	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD SE			LINWOOD AVE SW	7/29/2011	15:16	No Injury	0	0	3	0	0	At Intersection and Related	From same direction - both going straight - one stopped - sideswipe
City Street	CAPITOL BLVD SW			LINWOOD AVE SW	3/30/2013	17:15	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	CAPITOL BLVD SW		4100	LINWOOD AVE SW	11/21/2014	12:27	Possible Injury	1	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	CAPITOL BLVD SW			LINWOOD AVE SW	5/3/2014	20:42	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	LINWOOD AVE SW			CAPITOL BLVD SE	8/3/2010	7:59	Possible Injury	1	0	2	0	0	At Intersection and Related	Entering at angle
City Street	LINWOOD AVE SW			CAPITOL BLVD SW	11/20/2012	14:42	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
27 - Henderson Blvd / Yelm Hwy														
City Street	HENDERSON BLVD SE		4600	YELM HWY SE	9/20/2014	21:22	Evident Injury	2	0	2	0	0	At Intersection and Related	Entering at angle
City Street	HENDERSON BLVD SE		4500	YELM HWY SE	8/31/2012	14:55	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	HENDERSON BLVD SE			YELM HWY SE	9/21/2014	10:35	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	HENDERSON BLVD SE		4500	YELM HWY SE	11/24/2010	13:40	No Injury	0	0	3	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	HENDERSON BLVD SE		4500	YELM HWY SE	4/4/2011	6:59	Evident Injury	1	0	2	0	0	At Intersection and Related	From same direction - all others
City Street	HENDERSON BLVD SE		4500	YELM HWY SE	8/2/2013	21:41	No Injury	0	0	2	0	0	At Intersection and Related	Same direction -- both turning right -- one stopped -- rear end
City Street	HENDERSON BLVD SE		4500	YELM HWY SE	12/18/2012	9:13	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	HENDERSON BLVD SE		4500	YELM HWY SE	8/9/2012	19:01	No Injury	0	0	2	0	0	At Intersection and Related	Same direction -- both turning right -- one stopped -- rear end
City Street	HENDERSON BLVD SE		4500	YELM HWY SE	12/31/2012	19:15	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	HENDERSON BLVD SE			YELM HWY SE	10/31/2014	14:46	No Injury	0	0	2	0	0	At Intersection and Related	Same direction -- both turning right -- one stopped -- rear end
City Street	HENDERSON BLVD SE			YELM HWY SE	10/14/2013	18:00	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	HENDERSON BLVD SE		1300	YELM HWY SE	11/19/2011	19:05	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
City Street	HENDERSON BLVD SE		4500	YELM HWY SE	4/23/2010	19:10	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
City Street	HENDERSON BLVD SE		4500	YELM HWY SE	10/19/2012	7:18	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	HENDERSON BLVD SE		4500	YELM HWY SE	4/17/2013	18:40	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
City Street	HENDERSON BLVD SE		4500	YELM HWY SE	2/5/2013	15:12	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	HENDERSON BLVD SE		4600	YELM HWY SE	7/7/2014	19:23	No Injury	0	0	2	0	0	At Intersection and Related	Same direction -- both turning right -- one stopped -- rear end
City Street	HENDERSON BLVD SE		4600	YELM HWY SE	1/9/2014	17:40	Possible Injury	2	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	HENDERSON BLVD SE			YELM HWY SE	3/21/2014	15:20	Possible Injury	1	0	2	0	0	At Intersection and Related	Same direction -- both turning right -- one stopped -- rear end
City Street	HENDERSON BLVD SE		4500	YELM HWY SE	5/13/2010	8:08	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - both moving - rear-end
City Street	HENDERSON BLVD SE		4500	YELM HWY SE	6/30/2013	16:24	Possible Injury	1	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	YELM HWY			HENDERSON BLVD	7/21/2011	22:42	Possible Injury	2	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	YELM HWY SE		1700	HENDERSON BLVD SE	9/22/2010	18:08	Evident Injury	1	0	1	0	1	At Intersection and Related	Vehicle - Pedalcyclist
City Street	YELM HWY SE		1700	HENDERSON BLVD SE	4/30/2010	17:53	No Injury	0	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - both moving - rear-end
City Street	YELM HWY SE			HENDERSON BLVD SE	10/17/2014	11:40	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	YELM HWY SE		1700	HENDERSON BLVD SE	3/7/2014	19:05	Evident Injury	2	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	YELM HWY SE			HENDERSON BLVD SE	3/21/2014	7:50	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	YELM HWY SE		1700	HENDERSON BLVD SE	7/11/2013	11:25	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
City Street	YELM HWY SE		1700	HENDERSON BLVD SE	3/17/2014	18:45	Possible Injury	2	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	YELM HWY SE		1700	HENDERSON BLVD SE	1/4/2010	21:20	Possible Injury	1	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	YELM HWY SE		1700	HENDERSON BLVD SE	12/10/2014	16:40	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle

JURISDICTION	PRIMARY TRAFFICWAY	MILE POST	BLOCK NUMBER	INTERSECTING TRAFFICWAY	DATE	TIME	MOST SEVERE INJURY TYPE	# INJ	#FAT	#VEH	#PED S	#PED AL	JUNCTION RELATIONSHIP	FIRST COLLISION TYPE / OBJECT STRUCK
City Street	YELM HWY SE		1700	HENDERSON BLVD SE	5/3/2013	13:38	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	YELM HWY SE		1700	HENDERSON BLVD SE	11/24/2010	13:28	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - both moving - rear-end
City Street	YELM HWY SE		1700	HENDERSON BLVD SE	9/25/2010	14:13	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	YELM HWY SE		1700	HENDERSON BLVD SE	9/21/2010	20:07	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	YELM HWY SE		1700	HENDERSON BLVD SE	7/12/2010	18:06	No Injury	0	0	3	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	YELM HWY SE		1700	HENDERSON BLVD SE	7/13/2012	13:44	Possible Injury	1	0	2	0	0	At Intersection and Related	Entering at angle

28 - Rural Rd / Trospen Rd

City Street	TROSPER RD SW		2100	RURAL RD SW	5/27/2010	17:46	Possible Injury	1	0	2	0	0	At Intersection and Related	Entering at angle
City Street	TROSPER RD SW		2100	RURAL RD SW	7/17/2012	15:48	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	TROSPER RD SW		2100	RURAL RD SW	1/8/2011	10:35	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
City Street	TROSPER RD SW		2100	RURAL RD SW	3/13/2012	8:14	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle

29 - Lake Park Dr / Trospen Rd

City Street	TROSPER RD SW		800	LAKE PARK DR SW	6/1/2012	17:35	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
City Street	TROSPER RD SW		800	LAKE PARK DR SW	11/11/2013	19:51	Possible Injury	2	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	TROSPER RD SW		800	LAKE PARK DR SW	9/17/2013	11:08	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	TROSPER RD SW		1000		4/28/2010	18:49	Serious Injury	1	0	1	0	1	At Driveway	Vehicle - Pedalcyclist

30 - Littlerock Rd / Trospen Rd

City Street	LITTLEROCK RD SW		5300	TROSPER RD SW	12/8/2013	17:09	Possible Injury	2	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one right turn
City Street	LITTLEROCK RD SW		5300	TROSPER RD SW	1/9/2013	17:16	No Injury	0	0	2	0	0	At Driveway within Major Intersection	From same direction - both going straight - both moving - sideswipe
City Street	LITTLEROCK RD SW		5300	TROSPER RD SW	12/6/2012	17:11	No Injury	0	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - one stopped - rear-end
City Street	LITTLEROCK RD SW		5300	TROSPER RD SW	7/20/2013	13:13	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	LITTLEROCK RD SW		5300	TROSPER RD SW	10/7/2011	13:39	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - both moving - sideswipe
City Street	LITTLEROCK RD SW		5300	TROSPER RD SW	1/29/2010	8:18	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - both moving - sideswipe
City Street	LITTLEROCK RD SW		5300	TROSPER RD SW	5/18/2013	15:01	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	LITTLEROCK RD SW		5300	TROSPER RD SW	9/12/2012	14:37	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - both moving - sideswipe
City Street	LITTLEROCK RD SW		5300	TROSPER RD SW	2/3/2014	22:30	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - all others
City Street	LITTLEROCK RD SW		5300		3/18/2010	19:39	No Injury	0	0	2	0	0	At Driveway	Entering at angle
City Street	LITTLEROCK RD SW		5300		4/17/2012	16:49	No Injury	0	0	2	0	0	At Driveway	Entering at angle
City Street	TROSPER RD SW		600	LITTLEROCK RD SW	11/14/2013	13:23	No Injury	0	0	2	0	0	At Intersection and Not Related	From same direction - all others
City Street	TROSPER RD SW		600	LITTLEROCK RD SW	1/11/2014	12:41	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	TROSPER RD SW			LITTLEROCK RD SW	1/10/2012	10:15	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	TROSPER RD SW		600	LITTLEROCK RD SW	8/25/2010	19:09	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	TROSPER RD SW		600	LITTLEROCK RD SW	4/16/2010	18:00	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
City Street	TROSPER RD SW		600	LITTLEROCK RD SW	10/25/2010	12:22	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
City Street	TROSPER RD SW		600	LITTLEROCK RD SW	9/27/2013	14:49	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
City Street	TROSPER RD SW		600	LITTLEROCK RD SW	8/14/2010	11:19	No Injury	0	0	2	0	0	At Driveway within Major Intersection	Entering at angle
City Street	LITTLEROCK RD SW		5300		12/30/2013	16:33	No Injury	0	0	2	0	0	At Driveway	From opposite direction - one left turn - one straight
City Street	LITTLEROCK RD SW		5300		11/10/2014	10:58	No Injury	0	0	2	0	0	At Driveway	Entering at angle
City Street	LITTLEROCK RD SW		5300		10/14/2012	19:24	No Injury	0	0	2	0	0	At Driveway	Entering at angle
City Street	LITTLEROCK RD SW		5300		11/9/2013	13:20	No Injury	0	0	2	0	0	At Driveway	Entering at angle
City Street	LITTLEROCK RD SW		5300		2/10/2010	15:51	Possible Injury	1	0	2	0	0	At Driveway	Entering at angle
City Street	LITTLEROCK RD SW		5300		11/6/2011	9:00	No Injury	0	0	2	0	0	At Driveway	Entering at angle
City Street	LITTLEROCK RD SW			S 2ND AVE SW	12/1/2014	17:00	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	LITTLEROCK RD SW		5300		9/24/2012	7:21	No Injury	0	0	1	0	0	At Driveway	Fence
City Street	LITTLEROCK RD SW		5300		7/26/2012	17:17	Possible Injury	1	0	2	0	0	At Driveway	Entering at angle
City Street	S 2ND AVE SW		500	TROSPER RD SW	11/24/2011	11:48	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	S 2ND AVE SW		1700		6/24/2010	11:36	No Injury	0	0	2	0	0	At Driveway	Same direction -- both turning right -- both moving -- sideswipe
City Street	TROSPER RD SW		600	S 2ND AVE SW	3/17/2010	16:21	No Injury	0	0	2	0	0	At Driveway within Major Intersection	Entering at angle
City Street	TROSPER RD SW		600	S 2ND AVE SW	8/26/2011	20:27	Possible Injury	3	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end

31 - I-5 SB Ramps/Tyee Dr at Trospen Rd

State Route	005LX10279	0.02			10/7/2014	13:36	Possible Injury	2	0	3	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005LX10279	0.02			6/18/2012	22:44	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
State Route	005LX10279	0.02			5/1/2013	17:30	Possible Injury	3	0	3	0	0	At Intersection and Related	From same direction - both going straight - both moving - rear-end
State Route	005LX10279	0.02			11/14/2014	13:58	No Injury	0	0	3	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005LX10279	0.02			10/23/2010	18:24	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
State Route	005LX10279	0.02			10/13/2012	14:35	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
State Route	005LX10279	0.02			2/9/2012	17:38	Possible Injury	1	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - both moving - rear-end
State Route	005LX10279	0.02			10/1/2013	13:30	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - all others
State Route	005LX10279	0.02			11/9/2012	16:55	No Injury	0	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - both moving - sideswipe
State Route	005LX10279	0.02			2/14/2014	11:38	No Injury	0	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - one stopped - rear-end

JURISDICTION	PRIMARY TRAFFICWAY	MILE POST	BLOCK NUMBER	INTERSECTING TRAFFICWAY	DATE	TIME	MOST SEVERE INJURY TYPE	# INJ	#FAT	#VEH	#PED S	#PED AL	JUNCTION RELATIONSHIP	FIRST COLLISION TYPE / OBJECT STRUCK
State Route	005LX10279	0.02			5/18/2011	19:05	Possible Injury	1	0	4	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005LX10279	0.02			10/29/2010	16:15	No Injury	0	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - both moving - rear-end
State Route	005LX10279	0.02			10/28/2013	11:46	No Injury	0	0	2	0	0	At Driveway within Major Intersection	Entering at angle
State Route	005LX10279	0.02			2/24/2011	16:40	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005LX10279	0.02			5/7/2014	11:54	Possible Injury	3	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005LX10279	0.02			8/8/2012	13:23	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005LX10279	0.02			9/25/2010	21:38	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
State Route	005LX10279	0.02			1/10/2014	13:10	No Injury	0	0	2	0	0	At Intersection and Related	Same direction -- both turning left -- both moving -- sideswipe
State Route	005LX10279	0.02			8/17/2011	16:07	No Injury	0	0	2	0	0	At Driveway within Major Intersection	From opposite direction - one left turn - one straight
State Route	005LX10279	0.02			1/9/2011	11:17	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - both moving - sideswipe
State Route	005LX10279	0.02			2/1/2014	12:48	No Injury	0	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - one stopped - rear-end
State Route	005LX10279	0.02			5/19/2014	16:01	Possible Injury	1	0	3	0	0	At Intersection and Not Related	From same direction - both going straight - one stopped - rear-end
State Route	005LX10279	0.02			5/5/2011	12:51	No Injury	0	0	2	0	0	At Driveway within Major Intersection	Entering at angle
State Route	005LX10279	0.02			11/26/2012	8:42	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
State Route	005LX10279	0.02			12/21/2010	17:55	Possible Injury	1	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - one stopped - rear-end
State Route	005LX10279	0.02			6/16/2011	19:09	Possible Injury	1	0	2	0	0	At Intersection and Not Related	From opposite direction - both going straight - sideswipe
State Route	005LX10279	0.02			4/7/2010	15:46	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - one left turn - one straight
State Route	005LX10279	0.02			2/8/2013	14:23	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - both moving - sideswipe
State Route	005LX10279	0.02			8/3/2012	18:00	No Injury	0	0	3	0	0	At Intersection and Not Related	From same direction - both going straight - both moving - rear-end
State Route	005LX10279	0.02			9/16/2011	11:18	No Injury	0	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - both moving - sideswipe
State Route	005LX10279	0.02			10/5/2010	16:47	No Injury	0	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - one stopped - rear-end
State Route	005LX10279	0.02			8/25/2011	11:55	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
State Route	005LX10279	0.02			7/30/2014	12:46	No Injury	0	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - one stopped - rear-end
State Route	005LX10279	0.02			9/4/2013	15:43	No Injury	0	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - one stopped - rear-end
State Route	005LX10279	0.02			3/29/2012	11:32	No Injury	0	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - both moving - sideswipe
State Route	005LX10279	0.02			9/16/2013	18:05	No Injury	0	0	3	0	0	At Intersection and Not Related	From same direction - both going straight - one stopped - rear-end
State Route	005LX10279	0.02			12/23/2014	20:40	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
State Route	005LX10279	0.02			8/28/2013	20:00	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - all others
State Route	005LX10279	0.02			9/6/2013	14:40	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005LX10279	0.02			9/10/2014	17:31	Evident Injury	1	0	3	0	0	At Intersection and Not Related	From same direction - both going straight - one moving - rear-end
State Route	005LX10279	0.02			3/16/2012	16:28	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005LX10279	0.02			9/15/2013	14:32	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005LX10279	0.02			8/12/2014	17:20	Possible Injury	1	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - both moving - rear-end
State Route	005LX10279	0.02			3/20/2013	14:54	Possible Injury	2	0	2	0	0	At Intersection and Related	Entering at angle
State Route	005LX10279	0.02			8/12/2014	18:29	Possible Injury	1	0	1	0	1	At Intersection and Related	Vehicle - Pedalcyclist
State Route	005LX10279	0.02			11/23/2013	12:55	No Injury	0	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - both moving - sideswipe
State Route	005LX10279	0.02			9/14/2013	11:42	Possible Injury	2	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	0055510247	0.02			12/12/2013	17:07	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005R110303	0.28			7/11/2011	14:26	No Injury	0	0	2	0	0	Intersection Related but Not at Intersection	From same direction - both going straight - both moving - rear-end
State Route	005R110303	0.30			2/1/2011	16:20	No Injury	0	0	2	0	0	Intersection Related but Not at Intersection	From same direction - all others
State Route	005R110303	0.30			8/18/2011	20:45	No Injury	0	0	1	0	0	Intersection Related but Not at Intersection	Vehicle overturned
State Route	005R110303	0.31			12/31/2014	10:35	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005R110303	0.32			4/1/2011	12:39	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - both moving - sideswipe
State Route	005R110303	0.32			3/7/2012	19:44	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005R110303	0.32			4/7/2011	16:22	No Injury	0	0	2	0	0	At Intersection and Related	Same direction -- both turning right -- one stopped -- rear end
State Route	005R110303	0.32			10/5/2010	12:38	No Injury	0	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - both moving - sideswipe
State Route	005R110303	0.32			10/7/2012	16:13	No Injury	0	0	2	0	0	At Intersection and Related	Same direction -- both turning right -- one stopped -- rear end
State Route	005R110303	0.32			5/21/2012	14:25	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005R110303	0.32			4/19/2011	12:16	No Injury	0	0	2	0	0	At Intersection and Related	Same direction -- both turning right -- one stopped -- rear end
State Route	005R110303	0.32			2/16/2011	18:06	No Injury	0	0	2	0	0	At Intersection and Related	Same direction -- both turning right -- one stopped -- rear end
State Route	005R110303	0.32			8/24/2011	12:26	Possible Injury	1	0	2	0	0	At Intersection and Related	Same direction -- both turning right -- one stopped -- rear end
State Route	005R110303	0.32			10/21/2014	11:40	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005R110303	0.32			12/9/2011	9:26	No Injury	0	0	2	0	0	At Intersection and Related	Same direction -- both turning right -- one stopped -- rear end
State Route	005R110303	0.32			5/7/2010	14:10	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - both moving - sideswipe
City Street	TROSPER RD SW		500		8/23/2014	11:35	No Injury	0	0	2	0	0	At Driveway	From opposite direction - one left turn - one straight
32 - I-5 NB Ramps / Trosper Rd														
State Route	005LX10279	0.12			10/28/2013	17:15	No Injury	0	0	3	0	0	Intersection Related but Not at Intersection	From same direction - both going straight - one stopped - rear-end
State Route	005LX10279	0.12			12/27/2011	11:30	No Injury	0	0	2	0	0	Intersection Related but Not at Intersection	From same direction - both going straight - one stopped - rear-end
State Route	005LX10279	0.12			12/28/2010	16:40	No Injury	0	0	2	0	0	Intersection Related but Not at Intersection	From same direction - both going straight - one stopped - rear-end
State Route	005LX10279	0.16			3/6/2012	14:52	No Injury	0	0	2	0	0	Intersection Related but Not at Intersection	From same direction - both going straight - both moving - rear-end
State Route	005LX10279	0.18			3/10/2010	11:50	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - one right turn - one straight

JURISDICTION	PRIMARY TRAFFICWAY	MILE POST	BLOCK NUMBER	INTERSECTING TRAFFICWAY	DATE	TIME	MOST SEVERE INJURY TYPE	# INJ	#FAT	#VEH	#PED S	#PED AL	JUNCTION RELATIONSHIP	FIRST COLLISION TYPE / OBJECT STRUCK
State Route	005LX10279	0.18			4/20/2010	8:03	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005LX10279	0.18			1/13/2010	6:56	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005LX10279	0.19			1/15/2010	15:13	Possible Injury	2	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005LX10279	0.19			11/3/2010	11:00	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
State Route	005LX10279	0.19			1/14/2010	18:00	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
State Route	005LX10279	0.19			11/1/2014	20:48	Possible Injury	1	0	2	0	0	At Intersection and Related	Entering at angle
State Route	005LX10279	0.19			8/13/2010	8:02	No Injury	0	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - both moving - rear-end
State Route	005LX10279	0.19			4/14/2013	15:29	Possible Injury	2	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005LX10279	0.19			3/31/2010	17:38	Unknown	0	0	3	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005LX10279	0.19			7/1/2014	13:37	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
State Route	005LX10279	0.19			5/24/2013	16:26	No Injury	0	0	3	0	0	At Intersection and Related	Entering at angle
State Route	005LX10279	0.19			7/22/2011	13:56	No Injury	0	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - both moving - rear-end
State Route	005LX10279	0.19			5/25/2014	16:10	Possible Injury	1	0	2	0	0	At Intersection and Related	Entering at angle
State Route	005LX10279	0.19			6/28/2014	14:29	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005LX10279	0.19			7/28/2014	16:48	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
State Route	005LX10279	0.19			3/16/2012	19:24	Possible Injury	1	0	4	0	0	At Intersection and Not Related	From same direction - both going straight - one stopped - rear-end
State Route	005LX10279	0.19			6/22/2014	16:58	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
State Route	005LX10279	0.21			12/19/2011	17:55	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - sideswipe
State Route	005LX10279	0.21			12/5/2011	11:18	Possible Injury	1	0	4	0	0	Intersection Related but Not at Intersection	From same direction - both going straight - one stopped - rear-end
State Route	005P110255	0.31			9/6/2013	18:00	No Injury	0	0	2	0	0	At Intersection and Related	Same direction -- both turning right -- one stopped -- rear end
State Route	005P110255	0.31			6/2/2011	8:03	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005P110255	0.31			12/6/2010	12:40	No Injury	0	0	2	0	0	At Intersection and Related	Same direction -- both turning right -- one stopped -- rear end
State Route	005P110255	0.31			4/26/2014	16:30	No Injury	0	0	2	0	0	At Intersection and Related	Same direction -- both turning right -- one stopped -- rear end

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City Street	TROSPER RD SW			CAPITOL BLVD SW	2/14/2013	18:44	No Injury	0	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - both moving - sideswipe
City Street	TROSPER RD SW			CAPITOL BLVD SW	9/1/2014	9:30	No Injury	0	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - both moving - sideswipe
City Street	TROSPER RD SW			CAPITOL BLVD SW	2/14/2013	18:44	No Injury	0	0	2	0	0	At Driveway within Major Intersection	Entering at angle
City Street	TROSPER RD SW			CAPITOL BLVD SW	9/5/2012	8:05	No Injury	0	0	2	0	0	At Intersection and Related	Same direction -- both turning left -- both moving -- sideswipe
City Street	TROSPER RD SW			CAPITOL BLVD SW	2/10/2010	9:47	No Injury	0	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - both moving - sideswipe
City Street	TROSPER RD SW			CAPITOL BLVD SW	10/29/2010	12:19	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	TROSPER RD SW			CAPITOL BLVD SW	3/21/2012	12:38	No Injury	0	0	3	0	0	At Intersection and Related	From same direction - both going straight - both moving - rear-end
City Street	TROSPER RD SW			CAPITOL BLVD SW	10/1/2013	12:13	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
City Street	TROSPER RD SW			CAPITOL BLVD SW	3/7/2014	8:29	Possible Injury	2	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	TROSPER RD SW			CAPITOL BLVD SW	7/7/2010	7:43	Possible Injury	2	0	3	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	TROSPER RD SW			CAPITOL BLVD SW	7/20/2010	11:11	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - both moving - sideswipe
City Street	CAPITOL BLVD SW	5200		TROSPER RD SW	9/26/2014	16:40	No Injury	0	0	2	0	0	At Intersection and Related	Same direction -- both turning left -- both moving -- sideswipe
City Street	CAPITOL BLVD SW	5200		TROSPER RD SW	10/22/2013	12:11	Possible Injury	1	0	3	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD SW	5200		TROSPER RD SW	1/21/2011	13:53	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD SW	5200		TROSPER RD SW	8/23/2014	12:30	No Injury	0	0	2	0	0	At Driveway within Major Intersection	Entering at angle
City Street	CAPITOL BLVD SW	5200		TROSPER RD SW	12/28/2010	11:47	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - both moving - sideswipe
City Street	CAPITOL BLVD SW	5200		TROSPER RD SW	9/18/2014	19:59	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD SW	5200		TROSPER RD SW	4/26/2012	11:29	No Injury	0	0	2	0	0	At Driveway within Major Intersection	Entering at angle
City Street	CAPITOL BLVD SW	5200		TROSPER RD SW	8/7/2014	15:04	Possible Injury	2	0	2	0	0	At Intersection and Related	Entering at angle
City Street	CAPITOL BLVD SW	5200		TROSPER RD SW	6/13/2013	13:04	No Injury	0	0	2	0	0	At Driveway within Major Intersection	From opposite direction - one left turn - one straight
City Street	CAPITOL BLVD SW	5200		TROSPER RD SW	4/12/2014	13:24	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - both moving - sideswipe
City Street	CAPITOL BLVD SW	5200		TROSPER RD SW	4/10/2010	9:13	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - both moving - sideswipe
City Street	CAPITOL BLVD SW	5200		TROSPER RD SW	2/8/2012	16:37	Possible Injury	1	0	3	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD SW	5200		TROSPER RD SW	4/5/2014	16:11	Possible Injury	1	0	2	0	0	At Intersection and Related	Same direction -- both turning left -- both moving -- sideswipe
City Street	CAPITOL BLVD SW	5200		TROSPER RD SW	6/18/2012	10:58	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - one left turn - one straight
City Street	CAPITOL BLVD SW	5200		TROSPER RD SW	1/18/2014	12:11	Evident Injury	1	0	1	0	0	At Intersection and Related	Vehicle overturned
City Street	CAPITOL BLVD SW	5200		TROSPER RD SW	5/6/2011	15:54	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - one left turn - one straight
City Street	CAPITOL BLVD SW	5100		TROSPER RD SW	11/21/2014	13:20	No Injury	0	0	1	0	0	At Intersection and Related	Signal Pole
City Street	CAPITOL BLVD SW	5200		TROSPER RD SW	6/26/2012	14:53	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD SW	5200		TROSPER RD SW	7/21/2010	21:57	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - one right turn - one straight
City Street	CAPITOL BLVD SW	5200		TROSPER RD SW	11/17/2014	15:31	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one right turn
City Street	CAPITOL BLVD SW	5200		TROSPER RD SW	10/15/2014	12:21	No Injury	0	0	2	0	0	At Intersection and Related	Same direction -- both turning left -- both moving -- sideswipe
City Street	CAPITOL BLVD SW	5200		TROSPER RD SW	3/10/2011	16:04	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
City Street	CAPITOL BLVD SW	5200		TROSPER RD SW	8/29/2014	23:30	Serious Injury	1	0	2	0	0	At Driveway	From opposite direction - one left turn - one straight
City Street	CAPITOL BLVD SW	1000		TROSPER RD SW	12/12/2010	14:15	No Injury	0	0	2	0	0	At Driveway	Entering at angle

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JURISDICTION	PRIMARY TRAFFICWAY	MILE POST	BLOCK NUMBER	INTERSECTING TRAFFICWAY	DATE	TIME	MOST SEVERE INJURY TYPE	# INJ	#FAT	#VEH	#PED S	#PED AL	JUNCTION RELATIONSHIP	FIRST COLLISION TYPE / OBJECT STRUCK
City Street	CAPITOL BLVD SE			LEE ST SE	10/26/2011	12:01	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
City Street	CAPITOL BLVD SW	5400		LEE ST SE	2/6/2013	11:26	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD SW	5600		LEE ST SE	9/25/2014	12:19	No Injury	0	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD SW	5600		LEE ST SE	9/4/2014	20:48	No Injury	0	0	2	0	0	Driveway Related but Not at Driveway	From same direction - both going straight - both moving - sideswipe
City Street	CAPITOL BLVD SW	5400		LEE ST SE	11/5/2012	16:50	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD SW	5400		LEE ST SE	12/21/2013	10:36	Possible Injury	1	0	2	0	0	At Intersection and Related	Entering at angle
City Street	CAPITOL BLVD SW	5400		LEE ST SE	3/29/2011	15:16	Possible Injury	1	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD SW	5400		LEE ST SE	11/27/2013	13:47	No Injury	0	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD SW			LEE ST SE	10/30/2011	21:53	Possible Injury	1	0	2	0	0	From opposite direction - one left turn - one straight	
City Street	CAPITOL BLVD SW	100		LEE ST SE	3/7/2012	16:04	No Injury	0	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - both moving - rear-end
City Street	CAPITOL BLVD SW	5400		LEE ST SE	6/21/2012	10:39	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD SW	5400		LEE ST SE	8/9/2012	13:12	No Injury	0	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD SW	5400		LEE ST SE	11/1/2012	14:29	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD SW	5400		LEE ST SE	2/24/2010	16:10	No Injury	0	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD SW	5400		LEE ST SW	4/21/2012	11:35	No Injury	0	0	2	0	0	At Driveway within Major Intersection	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD SW	5400		LEE ST SW	1/31/2014	12:42	No Injury	0	0	1	0	0	At Intersection and Related	Signal Pole
City Street	CAPITOL BLVD SW	5400		LEE ST SW	2/8/2010	16:13	Possible Injury	4	0	3	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD SW	5400		LEE ST SW	5/21/2012	13:36	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD SW			LEE ST SW	5/7/2013	10:32	Possible Injury	2	0	2	0	0	From opposite direction - one left turn - one straight	
City Street	CAPITOL BLVD SW	5400		LEE ST SW	1/11/2010	16:49	Evident Injury	1	0	1	1	0	At Intersection and Related	Vehicle going straight hits pedestrian
City Street	CAPITOL BLVD SW	5400		LEE ST SW	2/2/2010	16:08	No Injury	0	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD SW	5400		LEE ST SW	10/8/2012	13:55	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD SW	5600		LEE ST SW	9/2/2014	16:36	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD SW	5400		LEE ST SW	11/15/2013	16:55	Evident Injury	1	0	1	1	0	At Intersection and Related	Vehicle going straight hits pedestrian
City Street	CAPITOL BLVD SW	5400		LEE ST SW	6/14/2011	8:52	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD SW	5600		LEE ST SW	12/15/2014	11:57	No Injury	0	0	1	0	0	At Intersection and Related	Signal Pole
City Street	CAPITOL BLVD SW	5400		LEE ST SW	8/18/2010	15:50	No Injury	0	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD SW	5600		LEE ST SW	10/12/2014	13:14	Possible Injury	1	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - both moving - sideswipe
City Street	CAPITOL BLVD SW	5500			8/12/2010	17:08	No Injury	0	0	2	0	0	Intersection Related but Not at Intersection	From same direction - both going straight - both moving - rear-end
City Street	CAPITOL BLVD SW	5600			1/15/2013	12:24	No Injury	0	0	2	0	0	Driveway Related but Not at Driveway	From same direction - both going straight - one stopped - rear-end
City Street	LEE ST SE			CAPITOL BLVD SE	3/30/2010	10:59	No Injury	0	0	2	0	0	At Driveway within Major Intersection	From opposite direction - one left turn - one straight
City Street	LEE ST SE	100		CAPITOL BLVD SW	4/3/2012	15:30	Possible Injury	1	0	1	1	0	At Intersection and Related	Vehicle turning left hits pedestrian
City Street	LEE ST SE	100			6/15/2013	19:38	No Injury	0	0	2	0	0	At Driveway	Entering at angle
City Street	LEE ST SE	100			5/10/2011	17:27	No Injury	0	0	2	0	0	At Driveway	Entering at angle
City Street	LEE ST SE	100			7/16/2013	11:45	No Injury	0	0	2	0	0	At Driveway	Entering at angle
City Street	LEE ST SW	200		CAPITOL BLVD SW	8/27/2013	12:14	No Injury	0	0	3	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	LEE ST SW	100		MCDONALDS	10/6/2010	12:26	No Injury	0	0	2	0	0	At Driveway	Entering at angle
City Street	LEE ST SW	200			9/20/2010	16:37	No Injury	0	0	2	0	0	At Driveway	From opposite direction - one left turn - one straight
City Street	LEE ST SW	200			3/20/2013	10:38	No Injury	0	0	2	0	0	At Driveway	From opposite direction - one left turn - one straight
City Street	LEE ST SW	200			2/20/2012	15:37	No Injury	0	0	2	0	0	At Driveway	From same direction - one right turn - one straight
City Street	LEE ST SW	200			8/26/2013	12:23	No Injury	0	0	2	0	0	At Driveway	Entering at angle
City Street	LEE ST SW	200			8/17/2012	12:19	No Injury	0	0	1	0	0	At Driveway	Utility Pole

35 - Littlerock Rd at Fred Meyer / Costco Drwy

City Street	LITTLEROCK RD SW	5700		FRED MEYER COSTCO	12/2/2013	17:02	Possible Injury	1	0	1	1	0	At Intersection and Related	Vehicle turning left hits pedestrian
City Street	LITTLEROCK RD SW	5400		FRED MEYER COSTCO ENTRANCE	5/24/2014	9:35	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end

36 - Littlerock Rd / Costco Drwy

City Street	LITTLEROCK RD SW	5400		COSTCO	10/25/2014	11:19	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
City Street	LITTLEROCK RD SW	5600		COSTCO DR	11/10/2014	15:45	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	LITTLEROCK RD SW	5700		COSTCO DRVWY	11/14/2012	22:00	Evident Injury	1	0	1	1	0	At Intersection and Related	Vehicle going straight hits pedestrian

37 - Littlerock Rd / Kingswood Dr

City Street	LITTLEROCK RD SW	6300		KINGSWOOD DR SW	5/14/2012	14:24	No Injury	0	0	1	0	0	Circulating Roundabout	Street Light Pole or Base
City Street	LITTLEROCK RD SW	5700		KINGSWOOD DR SW	6/6/2012	14:55	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	LITTLEROCK RD SW	5700		KINGSWOOD DR SW	12/31/2014	18:11	Possible Injury	1	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	LITTLEROCK RD SW	5900		KINGSWOOD DR SW	1/23/2014	17:23	Possible Injury	1	0	2	0	0	Entering Roundabout	From same direction - both going straight - both moving - rear-end
City Street	LITTLEROCK RD SW	5900		KINGSWOOD DR SW	12/9/2014	7:28	No Injury	0	0	2	0	0	Circulating Roundabout	From same direction - both going straight - both moving - sideswipe
City Street	LITTLEROCK RD SW	6300		KINGSWOOD DR SW	11/14/2011	16:04	No Injury	0	0	2	0	0	Exiting Roundabout	From same direction - both going straight - both moving - rear-end
City Street	LITTLEROCK RD SW	6300		KINGSWOOD DR SW	8/16/2011	13:37	Evident Injury	1	0	1	1	0	Circulating Roundabout	Street Light Pole or Base
City Street	LITTLEROCK RD SW	6300		KINGSWOOD DR SW	7/7/2010	12:20	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - all others
City Street	LITTLEROCK RD SW	5900		KINGSWOOD DR SW	11/4/2014	12:43	Possible Injury	1	0	2	0	0	Entering Roundabout	From same direction - both going straight - both moving - rear-end
City Street	LITTLEROCK RD SW	5700		KINGSWOOD DR SW	11/10/2014	16:05	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end

JURISDICTION	PRIMARY TRAFFICWAY	MILE POST	BLOCK NUMBER	INTERSECTING TRAFFICWAY	DATE	TIME	MOST SEVERE INJURY TYPE	# INJ	#FAT	#VEH	#PED S	#PED AL	JUNCTION RELATIONSHIP	FIRST COLLISION TYPE / OBJECT STRUCK
City Street	LITTLEROCK RD SW		6000		3/8/2010	13:39	No Injury	0	0	2	0	0	Driveway Related but Not at Driveway	From same direction - both going straight - both moving - rear-end
City Street	LITTLEROCK RD SW		6000		10/30/2012	12:22	No Injury	0	0	2	0	0	Driveway Related but Not at Driveway	From same direction - both going straight - both moving - rear-end
City Street	LITTLEROCK RD SW		5700		7/28/2012	12:05	Evident Injury	1	0	1	0	1	At Driveway	Vehicle - Pedalcyclist
City Street	LITTLEROCK RD SW		5700		10/1/2011	13:29	Possible Injury	1	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	LITTLEROCK RD SW		5700		9/21/2011	19:43	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight

38 - Capitol Blvd / X St

City Street	CAPITOL BLVD SW		6200	X ST SE	10/6/2014	17:17	Possible Injury	1	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	CAPITOL BLVD SW		6200	X ST SE	5/11/2013	11:24	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	CAPITOL BLVD SW		6200	X ST SW	4/26/2011	17:57	Possible Injury	1	0	2	0	0	At Intersection and Related	Entering at angle
City Street	CAPITOL BLVD SW		6200		9/11/2013	13:59	Possible Injury	1	0	2	0	0	Driveway Related but Not at Driveway	From same direction - both going straight - both moving - rear-end

39 - Elm St / X St

City Street	ELM ST SE		6200	X ST SE	12/14/2012	11:24	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
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40 - Capitol Blvd /Dennis St

City Street	CAPITOL BLVD S		6600	DENNIS ST SE	4/21/2012	10:37	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
City Street	CAPITOL BLVD S		6600		7/9/2014	17:09	No Injury	0	0	2	0	0	At Driveway	Entering at angle
City Street	CAPITOL BLVD SW		6500	DENNIS ST SE	2/2/2011	18:12	Possible Injury	2	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	CAPITOL BLVD SW		6500	DENNIS ST SE	2/24/2012	11:37	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD SW		6500	DENNIS ST SE	3/2/2012	17:32	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD SW		6500	DENNIS ST SE	1/15/2010	14:28	Possible Injury	2	0	2	0	0	At Intersection and Related	Entering at angle
City Street	CAPITOL BLVD SW		6500	DENNIS ST SW	8/9/2012	23:15	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - both moving - rear-end
City Street	CAPITOL BLVD SW		6500	DENNIS ST SW	5/7/2014	17:50	Serious Injury	1	0	1	0	0	At Intersection and Not Related	Curb, Raised Traffic Island or Raised Median Curb
City Street	CAPITOL BLVD SW		6500		5/13/2014	16:05	No Injury	0	0	2	0	0	At Driveway	Entering at angle

41 - Capitol Blvd /Israel Rd

City Street	CAPITOL BLVD S		6700	ISRAEL RD SE	6/28/2013	16:27	Serious Injury	2	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	CAPITOL BLVD S		6700	ISRAEL RD SE	12/4/2013	12:54	Possible Injury	1	0	2	0	0	At Intersection and Related	Entering at angle
City Street	CAPITOL BLVD S			ISRAEL RD SE	1/24/2012	11:51	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
City Street	CAPITOL BLVD S		6700	ISRAEL RD SE	5/25/2010	7:41	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	CAPITOL BLVD S			ISRAEL RD SE	3/26/2012	20:24	Evident Injury	1	0	2	0	0	At Intersection and Related	Entering at angle
City Street	CAPITOL BLVD S		6700	ISRAEL RD SE	6/13/2013	9:09	Evident Injury	1	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	CAPITOL BLVD S		6800	ISRAEL RD SE	10/11/2014	0:16	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	CAPITOL BLVD S		6700	ISRAEL RD SE	2/12/2013	18:01	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD S		6800	ISRAEL RD SE	10/23/2014	13:44	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD S		6700	ISRAEL RD SE	3/5/2011	18:18	No Injury	0	0	2	0	0	At Driveway within Major Intersection	From same direction - one right turn - one straight
City Street	CAPITOL BLVD S		6700	ISRAEL RD SE	5/16/2013	18:12	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
City Street	CAPITOL BLVD S		6700	ISRAEL RD SE	6/18/2013	13:06	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	CAPITOL BLVD S			ISRAEL RD SE	11/17/2011	16:02	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	CAPITOL BLVD S		6700	ISRAEL RD SE	3/1/2010	8:25	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	CAPITOL BLVD S		6800	ISRAEL RD SE	9/25/2014	0:00	Possible Injury	1	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	CAPITOL BLVD S		6700	ISRAEL RD SE	7/26/2012	13:55	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	ISRAEL RD SE			CAPITOL BLVD S	1/30/2014	19:41	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	ISRAEL RD SE		0	CAPITOL BLVD S	6/15/2010	17:16	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - both moving - rear-end
City Street	ISRAEL RD SE		0	CAPITOL BLVD S	5/8/2010	13:36	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
City Street	ISRAEL RD SE		200		6/17/2011	8:31	No Injury	0	0	2	0	0	At Driveway	Entering at angle

42 - Black Lake Belmore Rd /66th Ave

City Street	66TH AVE SW		3800	BLACK LAKE BELMORE RD SW	3/27/2014	7:29	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
City Street	BLACK LAKE BELMORE RD S		6400	66TH AVE SW	12/5/2014	14:54	Possible Injury	1	0	2	0	0	At Intersection and Related	Entering at angle
City Street	BLACK LAKE BELMORE RD S		6400	66TH AVE SW	11/16/2012	23:52	Evident Injury	1	0	1	0	0	At Intersection and Related	Tree or Stump (stationary)
City Street	BLACK LAKE BELMORE RD S		6400	66TH AVE SW	7/12/2012	17:49	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - all others
City Street	BLACK LAKE BELMORE RD S		6400	66TH AVE SW	9/12/2014	21:28	No Injury	0	0	1	0	0	At Intersection and Related	Over Embankment - No Guardrail Present

43 - Kirsop Rd /66th Ave

City Street	66TH AVE SW		3100	KIRSOP RD SW	8/1/2011	17:33	No Injury	0	0	1	0	0	At Intersection and Related	Utility Pole
City Street	KIRSOP RD SW		3100	66TH AVE SW	1/6/2012	22:00	Possible Injury	2	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	KIRSOP RD SW		6200		7/24/2010	18:38	Evident Injury	1	0	1	0	0	At Intersection and Not Related	Tree or Stump (stationary)
City Street	KIRSOP RD SW		6200		5/25/2012	1:13	No Injury	0	0	2	0	0	At Driveway	Entering at angle

44 - Littlerock Rd / Odegard Rd

City Street	LITTLEROCK RD SW			ODEGARD RD SW	10/25/2013	12:17	No Injury	0	0	2	0	0	Entering Roundabout	From same direction - both going straight - both moving - rear-end
City Street	LITTLEROCK RD SW		6500	ODEGARD RD SW	11/21/2012	14:41	No Injury	0	0	2	0	0	Entering Roundabout	From same direction - both going straight - one stopped - rear-end
City Street	LITTLEROCK RD SW		6400		9/11/2014	17:40	Possible Injury	1	0	2	0	0	Roundabout Related but not at Roundabout	From same direction - both going straight - both moving - rear-end
City Street	LITTLEROCK RD SW		6500		11/10/2011	14:58	No Injury	0	0	2	0	0	Driveway Related but Not at Driveway	From same direction - both going straight - both moving - rear-end

JURISDICTION	PRIMARY TRAFFICWAY	MILE POST	BLOCK NUMBER	INTERSECTING TRAFFICWAY	DATE	TIME	MOST SEVERE INJURY TYPE	# INJ	#FAT	#VEH	#PED S	#PED AL	JUNCTION RELATIONSHIP	FIRST COLLISION TYPE / OBJECT STRUCK
City Street	LITTLEROCK RD SW		6600		7/3/2013	15:32	No Injury	0	0	1	0	1	At Driveway	Vehicle - Pedalcyclist

45 - Littlerock Rd at Israel Rd / 70th Ave

City Street	ISRAEL RD SW			LITTLEROCK RD SW	4/14/2014	15:04	No Injury	0	0	1	0	0	At Intersection and Related	Metal Sign Post
City Street	LITTLEROCK RD SW		3300	ISRAEL RD SW	8/11/2013	18:59	No Injury	0	0	1	0	0	Circulating Roundabout	Curb, Raised Traffic Island or Raised Median Curb
City Street	LITTLEROCK RD SW			ISRAEL RD SW	10/12/2012	13:32	No Injury	0	0	1	0	0	Exiting Roundabout	Wood Sign Post
City Street	LITTLEROCK RD SW			ISRAEL RD SW	6/19/2013	17:57	No Injury	0	0	2	0	0	Entering Roundabout	Entering at angle
City Street	LITTLEROCK RD SW			ISRAEL RD SW	2/23/2013	3:04	No Injury	0	0	1	0	0	Circulating Roundabout	Curb, Raised Traffic Island or Raised Median Curb
City Street	LITTLEROCK RD SW	0			7/5/2014	16:45	No Injury	0	0	1	0	0	Driveway Related but Not at Driveway	Curb, Raised Traffic Island or Raised Median Curb
City Street	LITTLEROCK RD SW	1200			12/21/2014	20:45	Unknown	0	0	1	0	0	Circulating Roundabout	Wood Sign Post
City Street	LITTLEROCK RD SW			70TH AVE SW	10/15/2014	19:11	No Injury	0	0	2	0	0	Entering Roundabout	Entering at angle
City Street	LITTLEROCK RD SW	6900		70TH AVE SW	12/13/2014	16:57	Possible Injury	1	0	1	0	0	Exiting Roundabout	Over Embankment - No Guardrail Present
City Street	LITTLEROCK RD SW			70TH AVE SW	10/7/2014	15:39	No Injury	0	0	2	0	0	Circulating Roundabout	Same direction -- both turning left -- both moving -- sideswipe
City Street	70TH AVE SW			LITTLEROCK RD SW	6/28/2010	13:35	No Injury	0	0	2	0	0	Entering Roundabout	Entering at angle
City Street	70TH AVE SW			LITTLEROCK RD SW	4/5/2010	11:34	No Injury	0	0	1	0	0	Exiting Roundabout	Retaining Wall (concrete, rock, brick, etc.)

46 - Linderson Way / Israel Rd

City Street	ISRAEL RD SW		900	LINDERSON WAY SW	10/2/2013	7:40	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	ISRAEL RD SW		900	LINDERSON WAY SW	10/23/2013	17:04	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
City Street	ISRAEL RD SW		900	LINDERSON WAY SW	10/31/2012	14:24	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	ISRAEL RD SW			LINDERSON WAY SW	11/18/2011	18:05	Possible Injury	1	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	ISRAEL RD SW		900	LINDERSON WAY SW	12/10/2010	14:35	Possible Injury	1	0	2	0	0	Driveway Related but Not at Driveway	From same direction - both going straight - both moving - rear-end
City Street	LINDERSON WAY SW	6900			5/6/2014	14:24	No Injury	0	0	2	0	0	At Driveway	Entering at angle
City Street	LINDERSON WAY SW	6800			11/23/2011	7:27	No Injury	0	0	2	0	0	At Driveway	From same direction - one left turn - one straight

47 - Littlerock Rd /Tumwater Blvd

City Street	LITTLEROCK RD SW	7200		TUMWATER BLVD SW	10/14/2014	14:20	No Injury	0	0	2	0	0	Circulating Roundabout	From same direction - both going straight - both moving - rear-end
City Street	LITTLEROCK RD SW			TUMWATER BLVD SW	8/29/2013	11:27	No Injury	0	0	2	0	0	Circulating Roundabout	From same direction - both going straight - both moving - sideswipe
City Street	LITTLEROCK RD SW	1700		TUMWATER BLVD SW	4/3/2014	10:31	Possible Injury	1	0	2	0	0	Entering Roundabout	From same direction - both going straight - one stopped - rear-end
City Street	LITTLEROCK RD SW	7200		TUMWATER BLVD SW	11/5/2013	11:59	No Injury	0	0	2	0	0	Exiting Roundabout	From same direction - both going straight - one stopped - rear-end
City Street	LITTLEROCK RD SW	7200		TUMWATER BLVD SW	8/7/2014	10:46	No Injury	0	0	2	0	0	Circulating Roundabout	Same direction -- both turning left -- both moving -- sideswipe
City Street	LITTLEROCK RD SW			TUMWATER BLVD SW	3/2/2011	12:28	No Injury	0	0	2	0	0	Exiting Roundabout	From same direction - both going straight - both moving - sideswipe
City Street	LITTLEROCK RD SW			TUMWATER BLVD SW	3/26/2013	23:50	No Injury	0	0	1	0	0	Entering Roundabout	Concrete Barrier/Jersey Barrier - Face
City Street	LITTLEROCK RD SW			TUMWATER BLVD SW	3/26/2010	17:04	Possible Injury	1	0	2	0	0	Entering Roundabout	From same direction - both going straight - one stopped - rear-end
City Street	LITTLEROCK RD SW			TUMWATER BLVD SW	12/15/2010	17:22	No Injury	0	0	2	0	0	Exiting Roundabout	From same direction - one left turn - one straight
City Street	LITTLEROCK RD SW			TUMWATER BLVD SW	5/19/2010	17:12	No Injury	0	0	2	0	0	Circulating Roundabout	From same direction - both going straight - both moving - sideswipe
City Street	LITTLEROCK RD SW	5100		TUMWATER BLVD SW	2/27/2014	7:29	No Injury	0	0	2	0	0	At Intersection and Related	Curb, Raised Traffic Island or Raised Median Curb
City Street	LITTLEROCK RD SW			TUMWATER BLVD SW	5/25/2013	14:50	No Injury	0	0	1	0	0	Exiting Roundabout	Metal Sign Post
City Street	LITTLEROCK RD SW	100			8/7/2013	13:11	No Injury	0	0	2	0	0	Circulating Roundabout	Wood Sign Post
City Street	LITTLEROCK RD SW				1/10/2011	8:41	No Injury	0	0	2	0	0	Entering Roundabout	From same direction - both going straight - both moving - rear-end
City Street	LITTLEROCK RD SW	7100			12/6/2014	16:10	No Injury	0	0	1	0	0	Entering Roundabout	Curb, Raised Traffic Island or Raised Median Curb
City Street	LITTLEROCK RD SW				10/27/2012	13:30	No Injury	0	0	2	0	0	Roundabout Related but not at Roundabout	From same direction - both going straight - both moving - sideswipe
City Street	TUMWATER BLVD SW			LITTLEROCK RD SW	1/29/2010	5:15	No Injury	0	0	1	0	0	Exiting Roundabout	Metal Sign Post
City Street	TUMWATER BLVD SW	5500		LITTLEROCK RD SW	9/13/2014	16:25	Evident Injury	1	0	1	0	0	Exiting Roundabout	Vehicle overturned
City Street	TUMWATER BLVD SW			LITTLEROCK RD SW	9/17/2010	18:40	No Injury	0	0	2	0	0	Entering Roundabout	From same direction - one right turn - one straight

48 - I-5 SB Ramps /Tumwater Blvd

State Route	005R110162	0.36			11/20/2014	6:59	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005LX10130	0.00			2/14/2013	14:30	No Injury	0	0	3	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005LX10130	0.00			10/23/2014	19:01	Possible Injury	1	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
State Route	005LX10130	0.00			12/7/2012	7:29	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005LX10130	0.00			4/6/2010	17:09	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005LX10130	0.00			1/24/2014	18:11	No Injury	0	0	3	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
State Route	005LX10130	0.00			2/22/2014	17:21	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
State Route	005LX10130	0.00			3/3/2014	10:00	No Injury	0	0	2	0	0	At Intersection and Related	Same direction -- both turning left -- both moving -- sideswipe
State Route	005LX10130	0.00			1/25/2012	17:06	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005LX10130	0.00			3/5/2014	7:17	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
State Route	005LX10130	0.00			12/4/2012	18:14	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
State Route	005LX10130	0.00			11/3/2012	16:58	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
State Route	005LX10130	0.00			10/20/2011	15:47	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - all others
State Route	005LX10130	0.00			5/15/2014	12:25	No Injury	0	0	2	0	0	At Intersection and Related	Same direction -- both turning left -- both moving -- sideswipe
State Route	005LX10130	0.00			7/24/2014	16:26	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end

49 - I-5 SB Ramps /Tumwater Blvd

State Route	005LX10130	0.16			6/15/2012	14:18	Possible Injury	1	0	2	0	0	At Intersection and Related	Entering at angle
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JURISDICTION	PRIMARY TRAFFICWAY	MILE POST	BLOCK NUMBER	INTERSECTING TRAFFICWAY	DATE	TIME	MOST SEVERE INJURY TYPE	# INJ	#FAT	#VEH	#PED S	#PED AL	JUNCTION RELATIONSHIP	FIRST COLLISION TYPE / OBJECT STRUCK
State Route	005LX10130	0.16			1/7/2013	16:19	No Injury	0	0	1	0	0	At Intersection and Related	Guardrail - Face
State Route	005LX10130	0.16			5/10/2011	20:36	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
State Route	005LX10130	0.16			3/1/2014	9:44	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
State Route	005LX10130	0.16			2/5/2014	14:44	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
State Route	005LX10130	0.16			11/27/2014	17:12	Possible Injury	1	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
State Route	005LX10130	0.16			10/25/2010	10:46	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
State Route	005LX10130	0.16			7/21/2014	11:03	Evident Injury	3	0	2	0	0	At Intersection and Related	Entering at angle
State Route	005LX10130	0.16			1/23/2013	11:47	Evident Injury	2	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
State Route	005LX10130	0.16			6/24/2014	22:33	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
State Route	005LX10130	0.16			9/23/2014	16:28	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
State Route	005P110093	0.39			12/7/2010	7:35	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005P110093	0.39			3/3/2013	15:15	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005P110093	0.39			6/10/2011	14:02	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end

50 - Linderson Way / Tumwater Blvd

City Street	CENTER ST SW		7500	TUMWATER BLVD SW	1/24/2014	7:15	No Injury	0	0	1	0	0	At Intersection and Related	Curb, Raised Traffic Island or Raised Median Curb
City Street	TUMWATER BLVD SW			CENTER ST SW	9/26/2014	7:53	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	TUMWATER BLVD SW			CENTER ST SW	4/26/2012	17:12	Possible Injury	1	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	TUMWATER BLVD SW			CENTER ST SW	1/27/2014	9:54	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
City Street	TUMWATER BLVD SW			CENTER ST SW	3/15/2013	18:04	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	TUMWATER BLVD SW			CENTER ST SW	12/12/2013	17:00	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	LINDERSON WAY SW	7400		TUMWATER BLVD SW	12/6/2013	17:01	Possible Injury	1	0	2	0	0	At Intersection and Related	Same direction -- both turning right -- one stopped -- rear end
City Street	LINDERSON WAY SW	7400		TUMWATER BLVD SW	3/5/2014	8:22	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
City Street	TUMWATER BLVD SW			LINDERSON WAY SW	1/21/2010	10:55	Possible Injury	2	0	2	0	0	At Intersection and Related	From same direction - both going straight - both moving - rear-end
City Street	TUMWATER BLVD SW	1000		LINDERSON WAY SW	12/10/2014	16:29	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	TUMWATER BLVD SW			LINDERSON WAY SW	10/26/2012	15:45	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	TUMWATER BLVD SW			LINDERSON WAY SW	7/12/2012	14:42	Possible Injury	1	0	2	0	0	At Intersection and Related	Entering at angle
City Street	TUMWATER BLVD SW			LINDERSON WAY SW	2/17/2011	6:32	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	TUMWATER BLVD SW			LINDERSON WAY SW	3/19/2013	18:01	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	TUMWATER BLVD SW			LINDERSON WAY SW	3/27/2012	18:15	No Injury	0	0	2	0	0	At Intersection and Related	Same direction -- both turning right -- one stopped -- rear end

51 - New Market St / Tumwater Blvd

City Street	NEW MARKET ST SW			TUMWATER BLVD SW	7/17/2013	10:50	Possible Injury	1	0	1	0	0	Circulating Roundabout	Street Light Pole or Base
City Street	TUMWATER BLVD SW	200		NEW MARKET ST SW	10/1/2010	7:11	No Injury	0	0	2	0	0	Entering Roundabout	From same direction - one right turn - one straight
City Street	TUMWATER BLVD SW			NEW MARKET ST SW	7/2/2011	7:21	Possible Injury	1	0	1	0	0	Entering Roundabout	Curb, Raised Traffic Island or Raised Median Curb
City Street	TUMWATER BLVD SW			NEW MARKET ST SW	7/26/2012	7:31	No Injury	0	0	2	0	0	Circulating Roundabout	From same direction - one left turn - one straight
City Street	TUMWATER BLVD SW			NEW MARKET ST SW	2/18/2010	14:12	No Injury	0	0	2	0	0	Exiting Roundabout	From same direction - both going straight - both moving - sideswipe
City Street	TUMWATER BLVD SW			NEW MARKET ST SW	12/30/2012	1:40	No Injury	0	0	1	0	0	Entering Roundabout	Curb, Raised Traffic Island or Raised Median Curb
City Street	TUMWATER BLVD SW			NEW MARKET ST SW	6/5/2012	11:43	No Injury	0	0	2	0	0	Exiting Roundabout	From same direction - both going straight - both moving - sideswipe
City Street	TUMWATER BLVD SW				9/28/2012	12:35	No Injury	0	0	3	0	0	Driveway Related but Not at Driveway	From same direction - both going straight - one stopped - rear-end

52 - Capitol Blvd / Tumwater Blvd

City Street	CAPITOL BLVD S			TUMWATER BLVD SE	9/3/2013	15:47	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD S			TUMWATER BLVD SE	8/21/2014	17:18	Possible Injury	1	0	3	0	0	At Intersection and Related	Entering at angle
City Street	CAPITOL BLVD S			TUMWATER BLVD SE	1/29/2013	22:01	Possible Injury	1	0	2	0	0	At Driveway within Major Intersection	From opposite direction - one left turn - one straight
City Street	CAPITOL BLVD S			TUMWATER BLVD SE	10/20/2014	13:47	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD S			TUMWATER BLVD SE	3/11/2014	17:51	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one right turn
City Street	CAPITOL BLVD S			TUMWATER BLVD SE	10/1/2012	12:44	No Injury	0	0	3	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD S			TUMWATER BLVD SE	5/3/2014	13:30	No Injury	0	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD S			TUMWATER BLVD SW	2/15/2010	20:05	No Injury	0	0	2	0	0	At Intersection and Related	Same direction -- both turning left -- both moving -- sideswipe
City Street	CAPITOL BLVD S			TUMWATER BLVD SW	9/12/2010	13:55	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD S			TUMWATER BLVD SW	5/25/2010	18:46	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD S			TUMWATER BLVD SW	7/15/2012	11:12	Evident Injury	2	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	CAPITOL BLVD S				1/12/2011	11:59	No Injury	0	0	3	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD S	7200			5/30/2014	7:23	No Injury	0	0	2	0	0	Intersection Related but Not at Intersection	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD S				2/11/2012	16:18	Possible Injury	2	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	CAPITOL BLVD S				2/25/2012	6:36	Possible Injury	1	0	1	0	0	At Intersection and Not Related	Metal Sign Post
City Street	TUMWATER BLVD SE			CAPITOL BLVD S	10/24/2012	11:50	Possible Injury	1	0	1	0	0	At Intersection and Not Related	Street Light Pole or Base
City Street	TUMWATER BLVD SE			CAPITOL BLVD S	1/16/2013	7:58	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	TUMWATER BLVD SE				3/23/2011	12:30	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	TUMWATER BLVD SE	100			8/28/2010	17:18	No Injury	0	0	2	0	0	At Driveway	From same direction - both going straight - one stopped - rear-end
City Street	TUMWATER BLVD SE	100			2/1/2011	14:30	No Injury	0	0	2	0	0	At Driveway	From opposite direction - one left turn - one straight
City Street	TUMWATER BLVD SE	0			1/9/2010	17:54	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle

JURISDICTION	PRIMARY TRAFFICWAY	MILE POST	BLOCK NUMBER	INTERSECTING TRAFFICWAY	DATE	TIME	MOST SEVERE INJURY TYPE	# INJ	#FAT	#VEH	#PED S	#PED AL	JUNCTION RELATIONSHIP	FIRST COLLISION TYPE / OBJECT STRUCK
City Street	TUMWATER BLVD SW		7200	CAPITOL BLVD S	7/24/2011	10:58	No Injury	0	0	2	0	0	At Intersection and Related	Same direction -- both turning right -- one stopped -- rear end
City Street	TUMWATER BLVD SW		100	CAPITOL BLVD S	9/29/2014	7:59	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	TUMWATER BLVD SW			CAPITOL BLVD S	2/9/2013	15:03	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
City Street	TUMWATER BLVD SW			CAPITOL BLVD S	2/19/2010	4:05	Possible Injury	1	0	2	0	0	At Driveway within Major Intersection	Entering at angle
City Street	TUMWATER BLVD SW			CAPITOL BLVD S	9/24/2012	12:55	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - both moving - sideswipe
City Street	TUMWATER BLVD SW			CAPITOL BLVD S	11/1/2012	7:03	No Injury	0	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - one stopped - rear-end

53 - 65th Ave / Henderson Blvd

County Road	12120	1.280		16620	9/6/2012	16:40	No Injury	0	0	3	0	0	Intersection Related but Not at Intersection	From same direction - both going straight - one stopped - rear-end
County Road	12120	1.280		16620	9/11/2014	8:55	Possible Injury	3	0	3	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end

54 -Tumwater Blvd/ Henderson Blvd

City Street	HENDERSON BLVD SE		6900	TUMWATER BLVD SE	3/30/2010	15:34	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	HENDERSON BLVD SE		7000	TUMWATER BLVD SE	12/31/2012	12:19	No Injury	0	0	1	0	0	At Intersection and Related	Fence
City Street	TUMWATER BLVD SE		1100	HENDERSON BLVD SE	8/8/2013	17:16	No Injury	0	0	3	0	0	At Intersection and Related	From same direction - both going straight - both moving - rear-end
City Street	TUMWATER BLVD SE		1100	HENDERSON BLVD SE	6/23/2012	13:45	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	TUMWATER BLVD SE		1100	HENDERSON BLVD SE	7/9/2010	15:08	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle

55 -Trails End Dr / Henderson Blvd

City Street	HENDERSON BLVD SE		7500		10/25/2012	7:24	Possible Injury	2	0	2	0	0	At Driveway	From same direction - both going straight - one stopped - rear-end
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56 - Littlerock Rd / Black Hills School Drwy

City Street	LITTLEROCK RD SW		7741	THS	1/8/2014	12:45	No Injury	0	0	1	0	0	At Intersection and Related	Signal Pole
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57 - Old Hwy 99 / Henderson Blvd

City Street	OLD HIGHWAY 99 SE		7600	HENDERSON BLVD SE	5/15/2014	11:45	Possible Injury	2	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	OLD HIGHWAY 99 SE		7600	HENDERSON BLVD SE	6/27/2013	18:03	Possible Injury	2	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	OLD HIGHWAY 99 SE		7600	HENDERSON BLVD SE	7/11/2013	11:15	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	OLD HIGHWAY 99 SE		7600	HENDERSON BLVD SE	7/20/2010	19:24	Possible Injury	1	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	OLD HIGHWAY 99 SE		7600	HENDERSON BLVD SE	11/24/2012	14:35	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	OLD HIGHWAY 99 SE		7700	HENDERSON BLVD SE	12/1/2014	16:30	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	OLD HIGHWAY 99 SE		7700	HENDERSON BLVD SE	9/20/2011	16:44	No Injury	0	0	3	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	OLD HIGHWAY 99 SE		7600	HENDERSON BLVD SE	10/13/2013	15:18	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	OLD HIGHWAY 99 SE			HENDERSON BLVD SE	1/16/2013	22:22	No Injury	0	0	1	0	0	At Intersection and Related	Utility Pole
City Street	OLD HIGHWAY 99 SE		7700	HENDERSON BLVD SE	1/9/2012	9:21	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	OLD HIGHWAY 99 SE		7600	HENDERSON BLVD SE	2/22/2010	8:44	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	OLD HIGHWAY 99 SE		7600	HENDERSON BLVD SE	5/15/2011	13:20	Possible Injury	2	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	OLD HIGHWAY 99 SE		7600		5/7/2011	14:21	Possible Injury	1	0	2	0	0	Intersection Related but Not at Intersection	From same direction - both going straight - one stopped - rear-end
City Street	OLD HIGHWAY 99 SE		7700		11/12/2010	7:34	No Injury	0	0	3	0	0	Intersection Related but Not at Intersection	From same direction - both going straight - both moving - rear-end
City Street	OLD HWY 99 SE			HENDERSON BLVD SE	3/8/2010	8:33	Possible Injury	2	0	2	0	0	Driveway Related but Not at Driveway	From same direction - both going straight - both moving - rear-end

58 - Old Hwy 99 / 79th Ave

City Street	OLD HIGHWAY 99 SE		7900	79TH AVE SE	8/17/2013	13:15	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
City Street	OLD HIGHWAY 99 SE		7900	79TH AVE SE	3/13/2010	15:19	Possible Injury	1	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	OLD HIGHWAY 99 SE		8000		5/27/2011	15:58	No Injury	0	0	3	0	0	At Driveway	From same direction - both going straight - one stopped - rear-end
City Street	OLD HIGHWAY 99 SE		8000		9/16/2011	15:03	No Injury	0	0	2	0	0	At Driveway	From same direction - both going straight - both moving - rear-end

59 - Kimmie St / 83rd Ave

City Street	83RD AVE SW		1300	CENTER ST SW	8/26/2014	17:34	Possible Injury	2	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	83RD AVE SW		800	CENTER ST SW	6/5/2014	11:10	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle

61 - Old Hwy 99 / 88th Ave

County Road	13765	19.722			5/20/2013	15:35	No Injury	0	0	2	0	0	At Driveway	From same direction - one right turn - one straight
County Road	13765	19.730			7/3/2010	15:25	No Injury	0	0	3	0	0	Driveway Related but Not at Driveway	From same direction - both going straight - one stopped - rear-end
County Road	13765	19.741			3/28/2012	10:35	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle

62 - I-5 SB Ramps / 93rd Ave

State Route	005LX09928	0.00			1/22/2011	13:39	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
State Route	005LX09928	0.00			6/21/2011	22:55	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
State Route	005LX09928	0.00			9/18/2010	22:17	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
State Route	005LX09928	0.00			4/22/2010	11:54	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
State Route	005LX09928	0.00			11/1/2010	18:41	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
State Route	005LX09928	0.00			8/22/2011	12:15	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
State Route	005LX09928	0.00			7/21/2011	13:06	No Injury	0	0	2	0	0	At Intersection and Related	Same direction -- both turning right -- both moving -- sideswipe
State Route	005LX09928	0.00			3/3/2011	6:55	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle

JURISDICTION	PRIMARY TRAFFICWAY	MILE POST	BLOCK NUMBER	INTERSECTING TRAFFICWAY	DATE	TIME	MOST SEVERE INJURY TYPE	# INJ	#FAT	#VEH	#PED S	#PED AL	JUNCTION RELATIONSHIP	FIRST COLLISION TYPE / OBJECT STRUCK
State Route	005LX09928	0.00			7/15/2011	18:05	Possible Injury	2	0	2	0	0	At Intersection and Related	Entering at angle
State Route	005LX09928	0.00			9/27/2010	13:36	Evident Injury	2	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005LX09928	0.00			4/13/2012	17:23	Possible Injury	1	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
State Route	005LX09928	0.00			11/22/2011	16:38	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
State Route	005R109958	0.31			3/7/2011	15:15	No Injury	0	0	2	0	0	Intersection Related but Not at Intersection	From same direction - both going straight - one stopped - rear-end
State Route	005R109958	0.32			1/5/2011	16:15	Possible Injury	2	0	3	0	0	Intersection Related but Not at Intersection	From same direction - both going straight - both moving - rear-end
State Route	005R109958	0.33			7/13/2010	15:50	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - one right turn - one straight
State Route	005R109958	0.33			3/30/2010	16:18	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - sideswipe
State Route	005R109958	0.33			1/3/2011	18:25	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - one right turn - one straight
State Route	005R109958	0.33			2/17/2011	18:03	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005R109958	0.33			8/30/2010	10:02	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - one left turn - one straight
State Route	005R109958	0.33			8/24/2010	13:32	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - one left turn - one straight
State Route	005R109958	0.33			4/27/2011	15:27	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005R109958	0.33			9/16/2011	13:13	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - one right turn - one straight

63 - I-5 NB Ramps / 93rd Ave

State Route	005P109890	0.40			4/17/2012	12:55	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005P109890	0.40			9/17/2010	16:18	Evident Injury	2	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005Q109977	0.00			11/21/2014	19:05	No Injury	0	0	1	0	0	At Intersection and Related	All other non-collision
State Route	005Q109977	0.01			9/22/2014	17:29	No Injury	0	0	2	0	0	At Intersection and Related	Same direction -- both turning right -- both moving -- rear end
State Route	005Q109977	0.02			11/22/2014	23:26	No Injury	0	0	1	0	0	At Intersection and Related	Roadway Ditch

64 - Kimmie St / 93rd Ave

State Route	121	7.24			1/21/2013	7:26	Evident Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	121	7.24			4/25/2013	7:00	Possible Injury	2	0	2	0	0	At Intersection and Related	From same direction - both going straight - both moving - rear-end
State Route	121	7.24			9/27/2013	10:20	Possible Injury	2	0	2	0	0	At Intersection and Related	From same direction - both going straight - both moving - rear-end
State Route	121	7.24			5/4/2014	17:08	Evident Injury	1	0	1	0	0	At Intersection and Related	Utility Pole
State Route	121	7.25			5/8/2013	14:42	Possible Injury	1	0	3	0	0	Intersection Related but Not at Intersection	From same direction - both going straight - both moving - rear-end

65 - Case Rd / 93rd Ave

66 - Tilley Rd (south) / 93rd Ave

State Route	121	6.24			5/26/2012	13:08	Evident Injury	1	0	1	0	0	At Intersection and Related	Vehicle overturned
State Route	121	6.24			1/22/2010	19:57	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
State Route	121	6.24			2/11/2011	5:25	No Injury	0	0	1	0	0	At Intersection and Related	Fence
State Route	121	6.24			7/5/2011	18:23	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
State Route	121	6.24			12/3/2011	6:48	No Injury	0	0	1	0	0	At Intersection and Related	Fence
State Route	121	6.24			7/19/2012	17:19	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	121	6.24			9/3/2013	9:49	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	121	6.24			9/11/2014	0:00	No Injury	0	0	1	0	0	At Intersection and Related	Utility Pole
State Route	121	6.24			12/3/2014	18:38	No Injury	0	0	2	0	0	At Driveway within Major Intersection	Other Objects

67 - Tilley Rd (north) / 93rd Ave

City Street	88TH AVE SE	800			5/14/2010	12:01	Possible Injury	2	0	2	0	0	At Driveway	From same direction - one right turn - one straight
City Street	93RD AVE SE	300			9/26/2012	20:30	Possible Injury	1	0	2	0	0	Not at Intersection and Not Related	From same direction - both going straight - both moving - rear-end
City Street	TILLEY RD SE	400	93RD AVE SE		12/11/2013	7:45	Unknown	0	0	1	0	0	At Intersection and Related	Utility Pole
City Street	TILLEY RD SE	8900			5/10/2014	0:01	Evident Injury	1	0	1	0	0	Not at Intersection and Not Related	Street Light Pole or Base

68 - Old Highway 99 / 93rd Ave

County Road	17010	16.065		13765	8/30/2013	19:23	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
County Road	13765	18.610		17010	8/5/2010	15:44	Evident Injury	1	0	2	0	0	At Intersection and Related	Vehicle overturned
County Road	13765	18.610		17010	12/1/2010	16:48	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
County Road	13765	18.610		17010	4/12/2013	19:43	Evident Injury	1	0	1	0	0	At Intersection and Related	Wood Sign Post

69 -Center / 76th

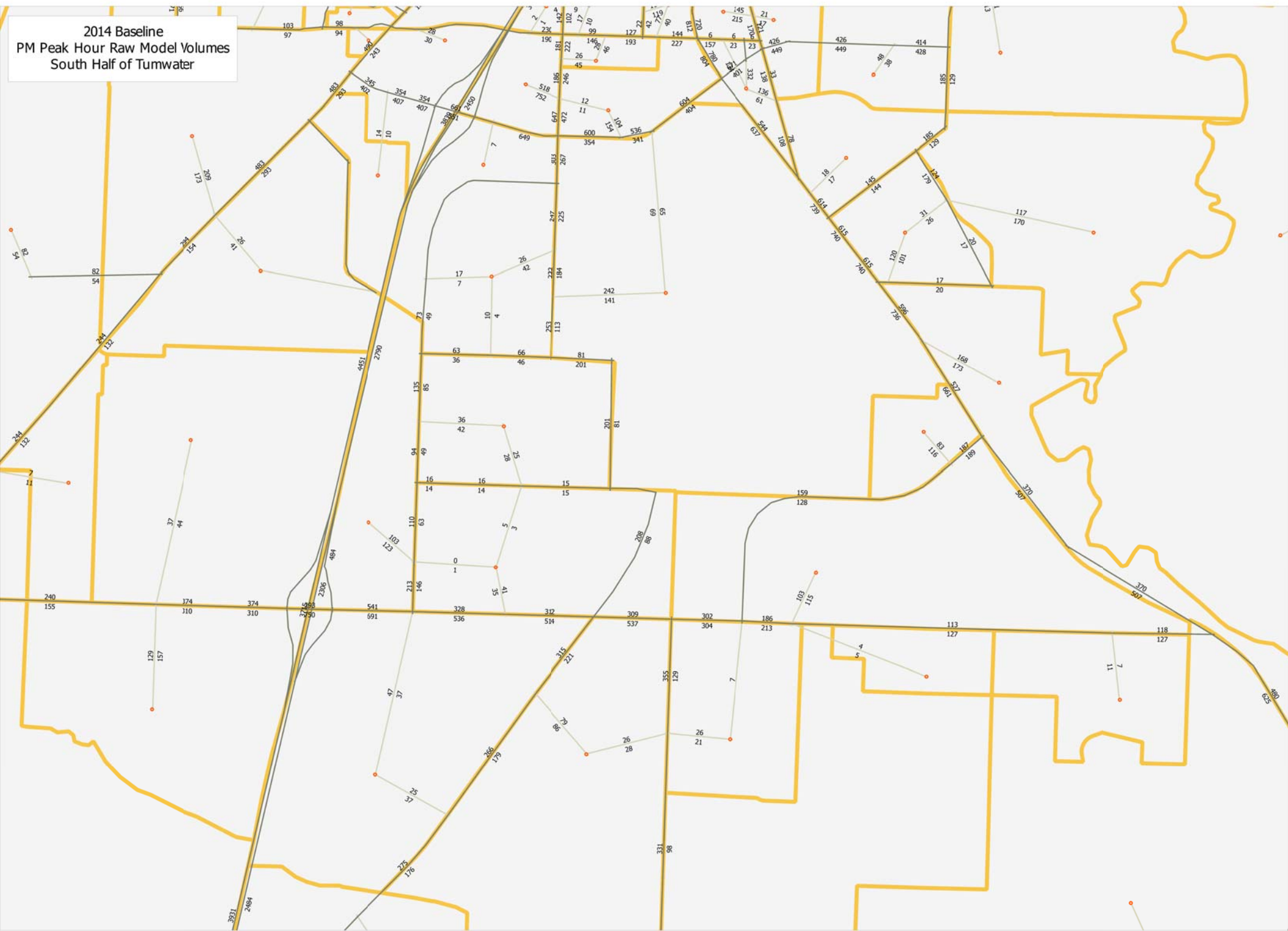
APPENDIX A-3

TRAVEL DEMAND MODEL PLOTS

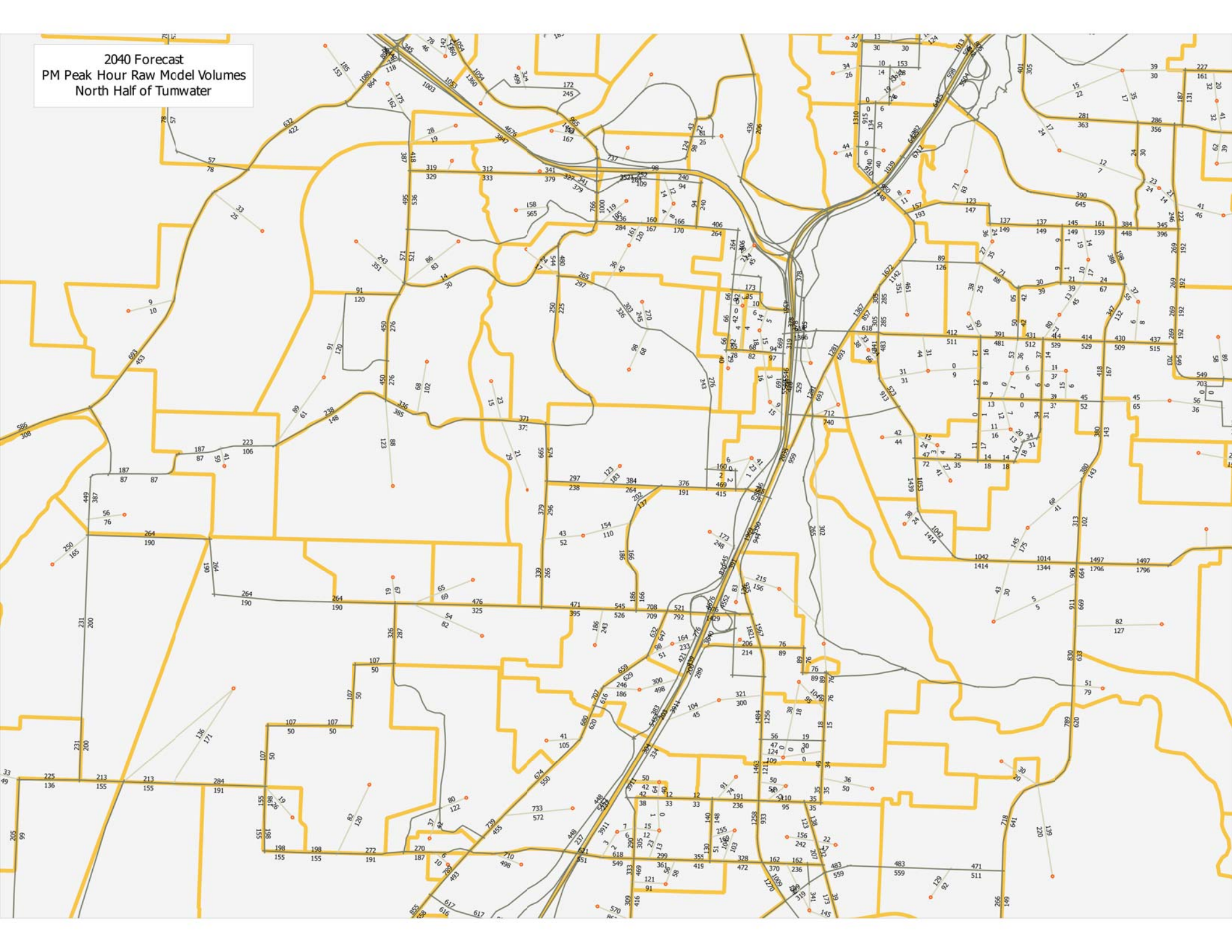
2014 Baseline
PM Peak Hour Raw Model Volumes
North Half of Tumwater

The map illustrates the road network and traffic volumes for the North Half of Tumwater during the 2014 Baseline PM Peak Hour. The roads are color-coded: yellow for major roads and orange for minor roads. Numerous numerical values are placed along the road segments, representing traffic volumes. A legend box in the top left corner provides the title and context for the data.

2014 Baseline
PM Peak Hour Raw Model Volumes
South Half of Tumwater



2040 Forecast
PM Peak Hour Raw Model Volumes
North Half of Tumwater



2040 Forecast
PM Peak Hour Raw Model Volumes
South Half of Tumwater

The map displays a network of roads with various volume values. A yellow boundary line outlines the area. Key roads and volume values include:

- North-South Roads:**
 - 1st St: 174, 274
 - 2nd St: 170, 273
 - 3rd St: 168, 278
 - 4th St: 151, 244
 - 5th St: 141, 241
 - 6th St: 131, 231
 - 7th St: 121, 221
 - 8th St: 111, 211
 - 9th St: 101, 201
 - 10th St: 91, 191
 - 11th St: 81, 181
 - 12th St: 71, 171
 - 13th St: 61, 161
 - 14th St: 51, 151
 - 15th St: 41, 141
 - 16th St: 31, 131
 - 17th St: 21, 121
 - 18th St: 11, 111
 - 19th St: 1, 101
 - 20th St: 1, 91
 - 21st St: 1, 81
 - 22nd St: 1, 71
 - 23rd St: 1, 61
 - 24th St: 1, 51
 - 25th St: 1, 41
 - 26th St: 1, 31
 - 27th St: 1, 21
 - 28th St: 1, 11
 - 29th St: 1, 1
 - 30th St: 1, 1
- East-West Roads:**
 - 1st St: 174, 274
 - 2nd St: 170, 273
 - 3rd St: 168, 278
 - 4th St: 151, 244
 - 5th St: 141, 241
 - 6th St: 131, 231
 - 7th St: 121, 221
 - 8th St: 111, 211
 - 9th St: 101, 201
 - 10th St: 91, 191
 - 11th St: 81, 181
 - 12th St: 71, 171
 - 13th St: 61, 161
 - 14th St: 51, 151
 - 15th St: 41, 141
 - 16th St: 31, 131
 - 17th St: 21, 121
 - 18th St: 11, 111
 - 19th St: 1, 101
 - 20th St: 1, 91
 - 21st St: 1, 81
 - 22nd St: 1, 71
 - 23rd St: 1, 61
 - 24th St: 1, 51
 - 25th St: 1, 41
 - 26th St: 1, 31
 - 27th St: 1, 21
 - 28th St: 1, 11
 - 29th St: 1, 1
 - 30th St: 1, 1

APPENDIX A-4

TRAFFIC VOLUME CALCULATION WORKSHEETS



Traffic Volume Calculation Worksheet
Tumwater Transportation Master Plan
PM Peak Hour Volumes

Intersection	Movement		2022 Volumes							2040 Base Model				
			EXISTING 2015	EXISTING MODEL	2040 EXISTING MODEL	BASE MODEL	7 YEAR GROWTH	BASE MODEL ADJUST	PROJECTED 2022 VOLUMES	2040 BASE MODEL	BASE MODEL Δ GROWTH	BASE MODEL ADJUST	PROJECTED 2040 VOLUMES	
			VOLUMES	VOLUMES	VOLUMES	Δ GROWTH	GROWTH							
1 RW Johnson Blvd SW Mottman Rd SW TMC Date: 06/30/15 Peak Hour: 4:15 - 5:15 PHF: .92	EB	L	43	-	-	-	0	3	46	-	0	12	55	
		T	79	-	-	-	0	5	84	-	0	22	101	
		R	7	-	-	-	0	0	7	-	0	2	9	
	WB	L	106	158	215	57	15		121	218	60		166	
		T	43	-	-	-	0	3	46	-	0	12	55	
		R	67	44	102	58	16		83	101	57		124	
	NB	L	4	-	-	-	0	0	4	-	0	1	5	
		T	155	232	314	82	22		177	317	85		240	
		R	135	212	218	6	2		137	219	7		142	
	SB	L	45	107	111	4	1		46	110	3		48	
		T	93	217	280	63	17		110	277	60		153	
		R	18	-	-	-	0	1	19	-	0	5	23	
2 Crosby Blvd SW Mottman Rd SW TMC Date: 10/08/2014 Peak Hour: 4:30 - 5:30 PHF: .89	EB	L	795	970	1,240	270	28%	6%	880	1,242	272	28%	1,121	
		T	176	184	203	19	5		181	211	27		203	
		R	252	168	157	-11	-3		249	148	-20		232	
	WB	L	25	12	20	8	2		27	20	8		33	
		T	4	0	0	0	0		4	0	0		4	
		R	31	21	23	2	1		32	21	0		31	
	NB	L	67	165	225	60	16		83	225	60		127	
		T	42	15	23	8	2		44	20	5		47	
		R	348	509	804	295	79		427	825	316		664	
	SB	L	166	201	167	-34	-9		157	155	-46		120	
		T	120	16	63	47	13		133	84	68		188	
		R	630	526	740	214	58		688	746	220		850	
3 Crosby Blvd SW Irving St SW TMC Date: 10/08/2014 Peak Hour: 4:45 - 5:45 PHF: .89	EB	L	2,286	2,006	2,718				2,754					
		T	73	299	304	5	1		74	301	2		75	
		R	19	82	112	30	8		27	112	30		49	
	WB	L	16	29	54	25	7		23	56	27		43	
		T	26	6	17	11	3		29	19	13		39	
		R	36	25	34	9	2		38	35	10		46	
	NB	L	166	200	271	71	19		185	256	56		222	
		T	26	14	19	5	1		27	21	7		33	
		R	290	226	420	194	52		342	443	217		507	
	SB	L	14	20	56	36	10		24	32	12		26	
		T	161	209	201	-8	-2		159	199	-10		151	
		R	424	235	458	223	60		484	470	235		659	
4 7th Ave SW Irving St TMC Date: 06/30/15 Peak Hour: 4:45 - 5:45 PHF: .92	EB	L	96	94	100	6	2		98	97	3		99	
		T	1,347	1,439	2,046	607	42%	10%		2,041	602	42%		
		R	5	0	0	0	0	0	5	0	0	2	7	
	WB	L	12	0	0	0	0	1	13	0	0	5	17	
		T	165	0	0	0	0	11	176	0	0	69	234	
		R	1	0	0	0	0	0	1	0	0	0	1	
	NB	L	18	0	0	0	0	1	19	0	0	8	26	
		T	1	0	0	0	0	0	1	0	0	0	1	
		R	173	0	0	0	0	11	184	0	0	72	245	
	SB	L	4	0	0	0	0	0	4	0	0	2	6	
		T	1	0	0	0	0	0	1	0	0	0	1	
		R	0	0	0	0	0	0	0	0	0	0	0	
5 Crosby Blvd SW Barnes Blvd SW TMC Date: 06/30/15 Peak Hour: 5:00 - 6:00 PHF: .91	EB	L	4	0	0	0	0	0	4	0	0	2	6	
		T	388	0	0			10%	413	0		42%	550	
		R	9	12	12	0	0		9	12	0		9	
	WB	L	1	2	2	0	0		1	2	0		1	
		T	0	2	2	0	0		0	3	1		1	
		R	10	10	9	-1	0		10	11	1		11	
	NB	L	3	4	4	0	0		3	4	0		3	
		T	189	153	246	93	25		214	249	96		285	
		R	1	2	2	0	0		1	2	0		1	
	SB	L	79	90	207	117	32		111	219	129		208	
		T	4	9	4	-5	-1		3	4	-5	5	4	
		R	237	185	282	97	26		263	291	106		343	
6 Black Lake Belmore Rd SW Black Lake Blvd SW TMC Date: 06/30/15 Peak Hour: 4:30 - 5:30 PHF: .94	EB	L	112	71	230	159	43		155	235	164		276	
		T	22	19	18	-1	0		22	18	-1		21	
		R	667	559	1,018				792	1,050			1,163	
	WB	L	0	-	-	-	0		0	-	0		0	
		T	170	183	206	23	6		176	205	22		192	
		R	69	86	102	16	4		73	103	17		86	
	NB	L	130	174	303	129	35		165	292	118		248	
		T	303	293	398	105	28		331	401	108		411	
		R	0	-	-	-	0		0	-	0		0	
	SB	L	178	152	191	39	11		189	185	33		211	
		T	0	-	-	-	0		0	-	0		0	
		R	105	122	239	117	32		137	248	126		231	
7 RW Johnson Blvd SW Sapp Rd SW TMC Date: 06/30/15 Peak Hour: 4:45 - 5:45 PHF: .85	EB	L	0	-	-	-	0		0	-	0		0	
		T	0	-	-	-	0		0	-	0		0	
		R	0	-	-	-	0		0	-	0		0	
	WB	L	955	1,010	1,439				1,071	1,434			1,379	
		T	15	103	41	-62	-17	1	16	46	-57	5	20	
		R	21	67	95	28	8		29	97	30		51	
	NB	L	1	2	5	3	1		2	6	4		5	
		T	6	21	45	24	6		12	46	25		31	
		R	35	74	107	33	9		44	109	35		70	
	SB	L	68	141	182	41	11		79	182	41		109	
		T	0	2	6	4	1		1	6	4		4	
		R	1	22	48	26	7		8	48	26		27	
8 Black Lake Belmore Rd SW Black Lake Blvd SW TMC Date: 06/30/15 Peak Hour: 4:45 - 5:45 PHF: .85	EB	L	3	16	34	18	5		8	33	17		20	
		T	86	194	235	41	11		97	256	62		148	
		R	3	33	72	39	11		14	71	38		41	
	WB	L	31	106	126	20	5		36	123	17		48	
		T	270	781	996	215	28%	6%	346	1,023	242	31%	574	



Traffic Volume Calculation Worksheet
Tumwater Transportation Master Plan
PM Peak Hour Volumes

Intersection	Movement		EXISTING	EXISTING	2040 EXISTING	BASE	2022 Volumes		PROJECTED	2040 BASE	BASE	BASE	PROJECTED
			2015	MODEL	MODEL	MODEL	7 YEAR	BASE	2022	MODEL	MODEL	MODEL	2040
			VOLUMES	VOLUMES	VOLUMES	Δ GROWTH	GROWTH	ADJUST	VOLUMES	VOLUMES	Δ GROWTH	ADJUST	VOLUMES
8 Sapp Rd SW Crosby Blvd SW TMC Date: 06/30/15 Peak Hour: 5:00 - 6:00 PHF: .91	EB	L	0	-	-	-	0		0	-	0		0
		T	0	-	-	-	0		0	-	0		0
		R	0	-	-	-	0		0	-	0		0
	WB	L	60	71	227	156	42		102	234	163		223
		T	0	-	-	-	0		0	-	0		0
		R	17	13	13	0	0		17	16	3		20
	NB	L	0	-	-	-	0		0	-	0		0
		T	129	258	362	104	28		157	358	100		229
		R	71	89	205	116	31		102	217	128		199
	SB	L	18	12	8	-4	-1		17	8	-4		14
		T	109	267	348	81	22		131	365	98		207
		R	0	-	-	-	0		0	-	0		0
9 Black Lake Belmore Rd SW 49th Ave SW TMC Date: 06/30/15 Peak Hour: 4:15 - 5:15 PHF: .90	EB	L	404	710	1,163				526	1,198			892
		T	8	38	65	27	7		15	65	27		35
		R	12	43	80	37	10		22	82	39		51
	WB	L	13	3	21	18	5		18	17	14		27
		T	39	0	0	0	0		39	0	0		39
		R	14	60	106	46	12		26	105	45		59
	NB	L	141	119	160	41	11		152	159	40		181
		T	9	5	29	24	6		15	30	25		34
		R	128	66	166	100	27		155	170	104		232
	SB	L	25	0	0	0	0		25	0	0		25
		T	74	101	90	-11	-3		71	108	7		81
		R	132	86	249	163	44		176	213	127		259
10 Capitol Blvd SE Carlyon Ave SE/Sunset Way SE TMC Date: 06/25/15 Peak Hour: 4:30 - 5:30 PHF: .85	Sunset	L	605	582	1,081				739	1,064			1,087
		T	33	196	281	85	23	3	36	281	85	-75	43
		R	13	93	146	53	14	1	14	146	53	-45	21
	Carlyon	L	2	33	34	1	0		2	35	2		4
		T	1	12	21	9	2		3	22	10		11
		R	56	33	34	1	0		56	35	2	75	133
	NB	L	39	28	32	4	1		40	32	4	45	88
		T	438	462	937	475	128		566	884	422		860
		R	88	44	54	10	3		91	50	6	54	148
	SB	L	15	145	209	64	17	1	16	209	64	-54	25
		T	816	710	1,367	657	177		993	1,356	646		1,462
		R	8	92	120	28	8	1	9	120	28	-18	18
11 Deschutes Way SW I-5 NB On Ramp TMC Date: 07/01/15 Peak Hour: 4:30 - 5:30 PHF: .79	EB	L	45	32	43	11	3		48	43	11	18	74
		T	1,554	1,880	3,278	266	38%	9%	1,874	3,213			2,887
		R	0	-	-	-	0		0	-	0		0
	WB	L	0	-	-	-	0		0	-	0		0
		T	0	-	-	-	0		0	-	0		0
		R	0	-	-	-	0		0	-	0		0
	NB	L	0	-	-	-	0		0	-	0		0
		T	223	154	227	73	20		243	206	52		275
		R	147	182	159	-23	-6		141	175	-7		140
	SB	L	158	49	63	14	4		162	58	9		167
		T	303	276	362	86	23		326	378	102		405
		R	0	-	-	-	0		0	-	0		0
12 Deschutes Way SW US 101 WB On Ramp TMC Date: 07/01/15 Peak Hour: 5:00 - 6:00 PHF: .92	EB	L	831	661	811				872	817			987
		T	0	-	-	-	0		0	-	0		0
		R	0	-	-	-	0		0	-	0		0
	WB	L	0	-	-	-	0		0	-	0		0
		T	0	-	-	-	0		0	-	0		0
		R	0	-	-	-	0		0	-	0		0
	NB	L	428	316	391	75	20		448	403	87		515
		T	385	336	386	50	13		398	381	45		430
		R	0	-	-	-	0		0	-	0		0
	SB	L	0	-	-	-	0		0	-	0		0
		T	260	276	362	86	23		283	378	102		362
		R	19	0	0	0	0		19	0	0	10	29
13 I-5 SB/US 101 EB Off Ramps/N 2nd Ave SW Desoto St SW TMC Date: 06/30/15 Peak Hour: 4:30 - 5:30 PHF: .89	EB	L	1,092	928	1,139				1,162		50%		1,336
		T	0	-	-	-	0		0	-	0		0
		R	151	145	218	73	20		171	200	55		206
	WB	L	0	-	-	-	0		0	-	0		0
		T	0	-	-	-	0		0	-	0		0
		R	0	-	-	-	0		0	-	0		0
	NB	L	172	276	382	106	29		201	378	102		274
		T	0	-	-	-	0		0	-	0		0
		R	0	-	-	-	0		0	-	0		0
	SB	L	0	-	-	-	0		0	-	0		0
		T	804	1151	1274	123	33		837	1280	129		933
		R	43	40	29	-11	-3		40	27	-13		30
14 N 2nd Ave SW Custer Way SW TMC Date: 02/10/15 Peak Hour: 4:45 - 5:45 PHF: .88	EB	L	1,170	1,612	1,903				1,885				
		T	0	-	-	-	0		0	-	0		0
		R	0	-	-	-	0		0	-	0		0
	WB	L	124	28	219	191	51		175	237	209	-96	237
		T	0	-	-	-	0		0	-	0		0
		R	151	267	382	115	31		182	378	111		262
	NB	L	0	-	-	-	0		0	-	0		0
		T	23	9	0	-9	-2		21	0	-9		14
		R	149	39	269	230	62		211	319	280	-110	319
	SB	L	814	945	1,039	94	25		839	1,047	102		916
		T	229	350	452	102	27		256	433	83		312
		R	0	-	-	-	0		0	-	0		0



Traffic Volume Calculation Worksheet
Tumwater Transportation Master Plan
PM Peak Hour Volumes

Intersection	Movement		EXISTING	EXISTING	2040 EXISTING	BASE	2022 VOLUMES	BASE	PROJECTED	2040 BASE	BASE	BASE	PROJECTED
			2015	MODEL	MODEL	MODEL	7 YEAR	MODEL	2022	VOLUMES	MODEL	MODEL	2040
			VOLUMES	VOLUMES	VOLUMES	Δ GROWTH	GROWTH	ADJUST	VOLUMES	VOLUMES	Δ GROWTH	ADJUST	VOLUMES
15 Boston St SW Custer Way SW TMC Date: 06/25/15 Peak Hour: 4:30 - 5:30 PHF: .95	L	L	0	-	-	-	0		0	-			0
	EB	T	709	917	1,208	291	78		787	1,203	286		995
	R	R	167	67	101	34	9		176	164	97		264
	L	L	371	368	401	33	9		380	234	-134		237
	WB	T	258	247	530	283	76		334	529	282		540
	R	R	3	-	-	-	0		3	-	0		3
	L	L	0	48	71	23	6	-6	0	85	37	-37	0
	NB	T	1	-	-	-	0		1	-	0	-1	0
	R	R	150	126	179	53	14		164	92	-34		116
	L	L	0	-	-	-	0		0	-	0		0
	SB	T	1	-	-	-	0		1	-	0		1
	R	R	4	-	-	-	0		4	-	0		4
			1,664	1,773	2,490				1,850	2,307			2,160
16 Deschutes Way SW Boston St SW TMC Date: 07/01/15 Peak Hour: 4:30 - 5:30 PHF: .93	L	L	0	-	-	-	0		0	-	0		0
	EB	T	0	-	-	-	0		0	-	0		0
	R	R	0	-	-	-	0		0	-	0		0
	L	L	95	64	135	71	19		114	148	84		179
	WB	T	0	-	-	-	0		0	-	0		0
	R	R	413	371	366	-5	-1		412	250	-121		292
	L	L	0	-	-	-	0		0	-	0		0
	NB	T	363	281	410	129	35		398	535	254		617
	R	R	61	75	121	46	12		73	83	8		69
	L	L	102	98	129	31	8		110	95	-3		99
	SB	T	186	178	234	56	15		201	283	105		291
	R	R	0	-	-	-	0		0	-	0		0
			1,220	1,067	1,395	328	31%	7%	1,308	1,394			1,547
17 Cleveland Ave SE Capitol Blvd SE TMC Date: 06/25/15 Peak Hour: 4:30 - 5:30 PHF: .88	L	L	0	-	-	-	0		0	-	0		0
	EB	T	332	440	916	476	128		460	857	417		749
	R	R	18	0	0	0	0		18	0	0		18
	L	L	363	225	342	117	32		395	305	80		443
	WB	T	551	713	1341	628	169		720	1367	654		1,205
	R	R	0	-	-	-	0		0	-	0		0
	L	L	0	0	0	0	0		0	0	0		0
	NB	T	0	-	-	-	0		0	-	0		0
	R	R	224	212	284	72	19		243	285	73		297
	L	L	0	-	-	-	0		0	-	0		0
	SB	T	0	-	-	-	0		0	-	0		0
	R	R	0	-	-	-	0		0	-	0		0
			1,488	1,590	2,883				1,836	2,814			2,712
18 Custer Way SE Capitol Blvd SE TMC Date: 02/10/15 Peak Hour: 4:45 - 5:45 PHF: .90	L	L	137	116	270	154	41		178	337	221		358
	EB	T	648	880	1,084	204	55		703	916	36		684
	R	R	80	47	33	-14	-4		76	42	-5		75
	L	L	344	337	534	197	53		397	182	-155		189
	WB	T	440	491	700	209	56		496	469	-22		418
	R	R	6	7	17	10	3		9	0	-7	6	5
	L	L	18	0	0	0	0		18	4	4		22
	NB	T	332	317	629	312	84		416	520	203		535
	R	R	426	412	624	212	57		483	169	-243		183
	L	L	18	5	22	17	5		23	20	15		33
	SB	T	392	584	1088	504	136		528	1057	473		865
	R	R	135	124	231	107	29		164	290	166		301
			2,976	3,320	5,232				3,491	4,006			3,668
19 Custer Way SE/North St SE Cleveland Ave SE TMC Date: 02/10/15 Peak Hour: 4:45 - 5:45 PHF: .93	L	L	50	0	0	0	0	5	55	0	0	21	71
	EB	T	332	375	572	197	53		385	510	135		467
	R	R	643	892	1,099	207	56		699	557	-335		308
	L	L	14	1	4	3	1		15	4	3		17
	WB	T	245	265	465	200	54		299	412	147		392
	R	R	70	16	16	0	0		70	16	0		70
	L	L	481	529	706	177	48		529	205	-324		157
	NB	T	133	195	269	74	20		153	269	74		207
	R	R	15	2	6	4	1		16	9	7		22
	L	L	106	18	27	9	2		108	26	8		114
	SB	T	279	208	315	107	29		308	279	71		350
	R	R	106	0	0	0	0	10	116	0	0	44	150
			2,474	2,501	3,479	978	39%	9%	2,752	2,287	445	41%	2,324
20 Hoadley St SE North St SE TMC Date: 06/24/15 Peak Hour: 5:00 - 6:00 PHF: .87	L	L	48	51	36	-15	-4		44	36	-15	28	76
	EB	T	268	255	485	230	62		330	463	208		476
	R	R	2	33	26	-7	-2		0	12	-21	1	3
	L	L	10	0	0	0	0		10	0	0	6	16
	WB	T	395	183	404	221	60		455	378	195		590
	R	R	50	18	14	-4	-1		49	14	-4	29	79
	L	L	1	20	18	-2	-1		0	7	-13	1	2
	NB	T	2	0	0	0	0		2	0	0	1	3
	R	R	6	0	15	15	4		10	8	8	3	9
	L	L	27	14	10	-4	-1		26	10	-4	16	43
	SB	T	1	0	0	0	0		1	0	0	1	2
	R	R	15	32	27	-5	-1		14	27	-5	9	24
			825	606	1,035				941	955	349	58%	1,321
21 Deschutes Way SW/I-5 NB Off Ramp E St SW TMC Date: 06/25/15 Peak Hour: 4:45 - 5:45 PHF: .85	L	L	0	-	-	-	0		0	-	0		0
	EB	T	0	-	-	-	0		0	-	0		0
	R	R	0	-	-	-	0		0	-	0		0
	L	L	0	-	-	-	0		0	-	0		0
	WB	T	0	-	-	-	0		0	-	0		0
	R	R	328	162	273	111	30		358	424	262		590
	L	L	0	-	-	-	0		0	-	0		0
	NB	T	79	129	114	-15	-4		75	105	-24		55
	R	R	136	326	444	118	32		168	483	157		293
	L	L	278	214	303	89	24		302	420	206		484
	SB	T	0	-	-	-	0		0	-	0		0
	R	R	0	-	-	-	0		0	-	0		0
			821	831	1,134				903	1,432			1,422



Traffic Volume Calculation Worksheet
Tumwater Transportation Master Plan
PM Peak Hour Volumes

Intersection	Movement		2022 Volumes							2040 Base Model				
			EXISTING 2015	EXISTING MODEL	2040 EXISTING MODEL	BASE MODEL	7 YEAR GROWTH	BASE MODEL ADJUST	PROJECTED 2022 VOLUMES	2040 BASE MODEL VOLUMES	BASE MODEL Δ GROWTH	BASE MODEL ADJUST	PROJECTED 2040 VOLUMES	
			VOLUMES	VOLUMES	VOLUMES	Δ GROWTH	GROWTH		VOLUMES	VOLUMES			VOLUMES	
22 Capitol Blvd SE E St SE TMC Date: 06/25/15 Peak Hour: 4:45 - 5:45 PHF: .86	EB	L	90	295	399	104	28		118	264	-31		59	
		T	88	37	54	17	5		93	363	326		414	
		R	255	209	294	85	23		278	277	68		323	
	WB	L	115	63	145	82	22		137	589	526		641	
		T	91	50	90	40	11		102	326	276		367	
		R	131	35	67	32	9		140	42	7		138	
	NB	L	216	112	183	71	19		235	98	-14		202	
		T	444	399	788	389	105		549	387	-12		432	
		R	132	32	76	44	12		144	475	443		575	
	SB	L	191	82	134	52	14		205	111	29		220	
		T	587	886	1521	635	171		758	1169	283		870	
		R	72	0	0	0	0	12	84	0	0	62	134	
			2,412	2,209	3,751	1,551	71%		4,101	1,901	86%		4,375	
23 Cleveland Ave SE South St SE TMC Date: 06/25/15 Peak Hour: 4:30 - 5:30 PHF: .88	EB	L	0	-	-	-	0		0	-	0		0	
		T	0	-	-	-	0		0	-	0		0	
		R	0	-	-	-	0		0	-	0		0	
	WB	L	7	6	7	1	0		7	5	-1		6	
		T	0	-	-	-	0		0	-	0		0	
		R	14	11	21	10	3		17	42	31		45	
	NB	L	0	-	-	-	0		0	-	0		0	
		T	571	703	931	228	61		632	1,046	343		914	
		R	11	8	8	0	0		11	7	-1		10	
	SB	L	15	18	33	15	4		19	65	47		62	
		T	854	1069	1356	287	77		931	1434	365		1,219	
		R	0	-	-	-	0		0	-	0		0	
			1,472	1,815	2,356				2,599				2,256	
24 7th Ave SW Linwood Ave SW TMC Date: 06/30/15 Peak Hour: 5:00 - 6:00 PHF: .93	EB	L	21	5	8	3	1		22	9	4		25	
		T	142	171	163	-8	-2		140	182	11		153	
		R	0	-	-	-	0		0	-	0		0	
	WB	L	1	-	-	-	0		1	-	0		1	
		T	261	284	374	90	24		285	366	82		343	
		R	224	154	95	-59	-16		208	103	-51		173	
	NB	L	0	-	-	-	0		0	-	0		0	
		T	0	-	-	-	0		0	-	0		0	
		R	1	-	-	-	0		1	-	0		1	
	SB	L	122	134	227	93	25		147	233	99		221	
		T	0	-	-	-	0		0	-	0		0	
		R	17	6	10	4	1		18	10	4		21	
			789	754	877				822	903			938	
25 2nd Ave SW Linwood Ave SW TMC Date: 06/30/15 Peak Hour: 4:45 - 5:45 PHF: .89	EB	L	30	3	86	83	22		52	104	101		131	
		T	163	258	228	-30	-8		155	241	-17		146	
		R	100	43	74	31	8		108	71	28		128	
	WB	L	100	170	308	138	37		137	320	150		250	
		T	247	309	371	62	17		264	368	59		306	
		R	58	28	28	0	0		58	37	9		67	
	NB	L	104	47	115	68	18		122	123	76		180	
		T	116	15	166	151	41		157	202	187		303	
		R	94	163	150	-13	-4		90	132	-31		63	
	SB	L	66	190	304	114	31		97	302	112		178	
		T	164	78	202	124	33		197	246	168		332	
		R	125	81	146	65	18		143	137	56		181	
			1,367	1,385	2,178				1,580	2,283			2,265	
26 Capitol Blvd SE Linwood Ave SW TMC Date: 06/25/15 Peak Hour: 4:45 - 5:45 PHF: .84	EB	L	165	291	260	-31	-8		157	243	-48		117	
		T	0	-	-	-	0	5	5	-	0	5	5	
		R	146	320	423	103	28		174	431	111		257	
	WB	L	0	-	-	-	0	15	15	-	0	15	15	
		T	0	-	-	-	0	5	5	-	0	5	5	
		R	0	-	-	-	0	10	10	-	0	10	10	
	NB	L	155	169	212	43	12		167	228	59		214	
		T	627	251	788	537	145		772	716	465		1,092	
		R	0	-	-	-	0	15	15	-	0	15	15	
	SB	L	0	-	-	-	0	10	10	-	0	10	10	
		T	706	818	1464	646	174		880	1538	720		1,426	
		R	240	339	495	156	42		282	497	158		398	
			2,039	2,188	3,642				2,492	3,653			3,564	
27 Henderson Blvd Yelm Hwy SE TMC Date: 06/25/15 Peak Hour: 4:45 - 5:45 PHF: .91	EB	L	7	2	5	3	1		8	5	3		10	
		T	681	942	1,156	214	58		739	1,214	272		953	
		R	158	90	130	40	11		169	125	35		193	
	WB	L	429	488	607	119	32		461	567	79		508	
		T	503	635	814	179	48		551	911	276		779	
		R	80	15	19	4	1		81	19	4		84	
	NB	L	109	62	102	40	11		120	94	32		141	
		T	166	42	78	36	10		176	78	36		202	
		R	644	435	516	81	22		666	491	56		700	
	SB	L	154	16	108	92	25		179	90	74		228	
		T	207	85	188	103	28		235	214	129		336	
		R	22	3	8	5	1		23	9	6		28	
			3,160	2,815	3,731				3,408	3,817			4,162	
28 Rural Rd SW Trosper Rd SW TMC Date: 06/25/15 Peak Hour: 4:30 - 5:30 PHF: .92	EB	L	35	36	108	72	19		54	110	74		109	
		T	177	129	232	103	28		205	215	86		263	
		R	0	-	-	-	0		0	-	0		0	
	WB	L	0	-	-	-	0		0	-	0		0	
		T	294	185	320	135	36		330	317	132		426	
		R	99	117	149	32	9		108	154	37		136	
	NB	L	0	-	-	-	0		0	-	0		0	
		T	0	-	-	-	0		0	-	0		0	
		R	0	-	-	-	0		0	-	0		0	
	SB	L	89	121	150	29	8		97	180	59		148	
		T	0	-	-	-	0		0	-	0		0	
		R	60	54	194	140	38		98	159	105		165	
			754	642	1,153				892	1,135			1,247	



Traffic Volume Calculation Worksheet
Tumwater Transportation Master Plan
PM Peak Hour Volumes

Intersection	Movement		EXISTING	EXISTING	2040 EXISTING	BASE	2022 VOLUMES	BASE	PROJECTED	2040 BASE	BASE	BASE	PROJECTED
			2015	MODEL	MODEL	MODEL	7 YEAR	MODEL	2022	MODEL	MODEL	MODEL	2040
			VOLUMES	VOLUMES	VOLUMES	Δ GROWTH	GROWTH	ADJUST	VOLUMES	VOLUMES	Δ GROWTH	ADJUST	VOLUMES
29 Lake Park Dr Trosper Rd SW TMC Date: 03/05/14 Peak Hour: 4:45 - 5:45 PHF: .98	EB	L	11	2	2	0	0		11	2	0		11
	EB	T	251	361	511	150	40		291	524	163		414
	EB	R	44	-	-	-	0	3	47	-	0	11	55
	WB	L	51	-	-	-	0	3	54	-	0	12	63
	WB	T	369	373	542	169	46		415	544	171		540
	WB	R	52	61	155	94	25		77	164	103		155
	NB	L	62	-	-	-	0	4	66	-	0	15	77
	NB	T	25	-	-	-	0	2	27	-	0	6	31
	NB	R	56	-	-	-	0	3	59	-	0	13	69
	SB	L	40	63	176	113	30		70	185	122		162
	SB	T	19	-	-	-	0	1	20	-	0	5	24
	SB	R	13	1	1	0	0		13	1	0		13
			993	861	1,387			6%	1,149	1,420	559	24%	1,614
30 2nd Ave SW/Littlerock Rd SW Trosper Rd SW TMC Date: 03/05/14 Peak Hour: 4:00 - 5:00 PHF: .98	EB	L	40	60	95	35	9		49	107	47		87
	EB	T	264	313	505	192	52		316	483	170		434
	EB	R	109	51	86	35	9		118	118	67		176
	WB	L	368	90	192	102	27		395	153	63		431
	WB	T	297	282	390	108	29		326	351	69		366
	WB	R	32	32	38	6	2		34	18	-14		18
	NB	L	187	75	171	96	26		213	215	140		327
	NB	T	216	69	251	182	49		265	266	197		413
	NB	R	396	90	257	167	45		441	167	77		473
	SB	L	100	77	138	61	16		116	142	65		165
	SB	T	236	108	338	230	62		298	361	253		489
	SB	R	44	77	137	60	16		60	142	65		109
			2,289	1,324	2,598				2,631	2,523			3,488
31 I-5 SB Ramps/Tyee Dr Trosper Rd SW TMC Date: 03/05/14 Peak Hour: 4:30 - 5:30 PHF: .95	EB	L	156	182	234	52	14		170	233	51		207
	EB	T	540	297	666	369	99		639	559	262		802
	EB	R	19	0	0	0	0		19	0	0	6	25
	WB	L	244	205	277	72	19		263	238	33		277
	WB	T	322	216	285	69	19		341	233	17		339
	WB	R	191	298	483	185	50		241	505	207		398
	NB	L	25	0	0	0	0		25	0	0	8	33
	NB	T	158	40	157	117	32		190	38	-2		156
	NB	R	335	463	495	32	9		344	564	101		436
	SB	L	460	380	266	-114	-31		429	306	-74		386
	SB	T	327	172	182	10	3		330	277	105		432
	SB	R	377	189	336	147	40		417	287	98		475
			3,154	2,442	3,381				3,408	3,240	798	33%	3,966
32 I-5 NB Ramps Trosper Rd SW TMC Date: 03/05/14 Peak Hour: 4:30 - 5:30 PHF: .93	EB	L	0	0	0	0	0		0	0	0		0
	EB	T	816	575	913	338	91		907	788	213		1,029
	EB	R	524	566	647	81	22		546	707	141		665
	WB	L	0	-	-	-	0		0	-	0		0
	WB	T	588	550	817	267	72		660	976	426		1,014
	WB	R	617	903	899	-4	-1		616	798	-105	-100	412
	NB	L	172	169	228	59	16		188	0	-169	-3	0
	NB	T	0	0	-	-	0		0	-	0		0
	NB	R	79	112	133	21	6		85	178	66		145
	SB	L	0	-	-	-	0		0	-	0		0
	SB	T	0	-	-	-	0		0	-	0		0
	SB	R	0	-	-	-	0		0	-	0		0
			2,796	2,875	3,637				3,223	3,447			3,265
33 Capitol Blvd SE Trosper Rd SW TMC Date: 03/05/14 Peak Hour: 4:30 - 5:30 PHF: .99	EB	L	282	77	228	151	41		323	391	314		596
	EB	T	47	-	-	-	0	5	52	-	0	20	67
	EB	R	579	611	685	74	20		599	510	-101	-20	458
	WB	L	29	-	-	-	0	3	32	-	0	21	50
	WB	T	70	-	-	-	0	7	77	-	0	180	250
	WB	R	33	-	-	-	0	3	36	-	0	17	50
	NB	L	771	1,005	1,088	83	22		793	1,023	18	-100	689
	NB	T	574	347	730	383	103		677	544	197		771
	NB	R	11	-	-	-	0	1	12	-	0		11
	SB	L	13	-	-	-	0	1	14	-	0	20	33
	SB	T	466	771	1320	549	148		614	1311	540	-20	986
	SB	R	348	448	628	180	48		396	750	302		650
			3,223	3,259	4,679	1,420	44%	10%		4,529			4,611
34 Capitol Blvd SE Lee St SW TMC Date: 03/05/14 Peak Hour: 4:30 - 5:30 PHF: .93	EB	L	261	159	307	148	40		301	136	-23		238
	EB	T	5	0	0	0	0	0	5	12	12		17
	EB	R	40	12	19	7	2	4	46	65	53		93
	WB	L	13	0	0	0	0	1	14	0	0		13
	WB	T	7	0	0	0	0	1	8	4	4		11
	WB	R	81	68	69	1	0		81	72	4		85
	NB	L	23	6	10	4	1		24	80	74	100	197
	NB	T	1,025	1,124	1,442	318	86		1,111	1,359	235	-100	1,160
	NB	R	21	0	0	0	0	2	23	0	0		21
	SB	L	50	59	83	24	6		56	77	18		68
	SB	T	816	1170	1638	468	126		942	1622	452		1,268
	SB	R	151	153	284	131	35		186	122	-31		120
			2,493	2,751	3,852	1,101	40%	9%	2,797	3,549			3,291
35 Littlerock Rd SW Fred Meyer/Costco Drwy TMC Date: 06/24/15 Peak Hour: 4:30 - 5:30 PHF: .96	EB	L	0	-	-	-	0		0	-	0		0
	EB	T	0	-	-	-	0		0	-	0		0
	EB	R	0	-	-	-	0		0	-	0		0
	WB	L	129	37	46	9	2		131	47	10		139
	WB	T	3	-	-	-	0		3	-	0		3
	WB	R	114	27	32	5	1		115	50	23		137
	NB	L	0	-	-	-	0		0	-	0		0
	NB	T	652	207	647	440	118		770	597	390		1,042
	NB	R	95	20	36	16	4		99	32	12		107
	SB	L	103	17	19	2	1		104	20	3		106
	SB	T	584	233	598	365	98		682	612	379		963
	SB	R	0	-	-	-	0		0	-	0		0
			1,680	541	1,378				1,904	1,358			2,497

Traffic Volume Calculation Worksheet

Tumwater Transportation Master Plan

PM Peak Hour Volumes

Intersection	Movement		2022 Volumes							2040 Base Model			
			EXISTING 2015	EXISTING MODEL	2040 EXISTING MODEL	BASE MODEL	7 YEAR GROWTH	BASE MODEL ADJUST	PROJECTED 2022	2040 BASE MODEL	BASE MODEL ADJUST	BASE MODEL ADJUST	PROJECTED 2040
			VOLUMES	VOLUMES	VOLUMES	Δ GROWTH	GROWTH		VOLUMES	VOLUMES	Δ GROWTH	ADJUST	VOLUMES
36 Littlerock Rd SW Costco Drwy TMC Date: 06/24/15 Peak Hour: 4:30 - 5:30 PHF: .95	L	L	80	-	-	-	0		80	-	0	20	100
	EB	T	23	-	-	-	0		23	-	0	6	29
	R	R	15	-	-	-	0		15	-	0	4	19
	L	L	125	160	170	10	3		128	131	-29		96
	WB	T	5	-	-	-	0		5	-	0	1	6
	R	R	194	49	142	93	25		219	115	66		260
	L	L	51	-	-	-	0		51	-	0	13	64
	NB	T	491	178	541	363	98		589	514	336		827
	R	R	98	55	108	53	14		112	103	48		146
	L	L	214	31	45	14	4		218	83	52		266
	SB	T	398	240	599	359	97		495	577	337		735
	R	R	80	-	-	-	0		80	-	0	20	100
			1,774	713	1,605	170	58%	13%	2,015	1,523	810	25%	2,648
	L	L	0	-	-	-	0		0	-	0		0
37 Littlerock Rd SW Kingswood Dr SW TMC Date: 06/24/15 Peak Hour: 4:30 - 5:30 PHF: .93	EB	T	0	-	-	-	0		0	-	0		0
	R	R	0	-	-	-	0		0	-	0		0
	L	L	178	0	0	0	0	24	202	5	5		183
	WB	T	0	-	-	-	0		0	-	0		0
	R	R	75	0	0	0	0	10	85	29	29		104
	L	L	0	-	-	-	0		0	-	0		0
	NB	T	496	233	649	416	112		608	587	354		850
	R	R	125	0	0	0	0	17	142	33	33		158
	L	L	59	0	0	0	0	8	67	32	32		91
	SB	T	519	400	769	369	99		618	675	275		794
	R	R	0	-	-	-	0		0	-	0		0
			1,452	633	1,418			13%	1,721	1,361			2,180
	L	L	22	-	-	-	0	2	24	-	0	8	30
	EB	T	1	-	-	-	0	0	1	-	0	0	1
38 Capitol Blvd SE X St SE TMC Date: 03/05/14 Peak Hour: 4:15 - 5:15 PHF: .89	R	R	16	-	-	-	0	1	17	-	0	6	22
	L	L	10	11	37	26	7		17	36	25		35
	WB	T	1	-	-	-	0	0	1	-	0	0	1
	R	R	21	21	21	0	0		21	20	-1		20
	L	L	20	-	-	-	0	2	22	-	0	7	27
	NB	T	904	948	1,218	270	73		977	1,236	288		1,192
	R	R	12	8	17	9	2		14	16	8		20
	L	L	36	32	31	-1	0		36	31	-1		35
	SB	T	712	977	1,448	471	127		839	1,453	476		1,188
	R	R	35	-	-	-	0	3	38	-	0	13	48
			1,790	1,997	2,772	775	39%	9%	2,008	2,792		36%	2,619
	L	L	6	0	0	0	0		6	0	0	2	8
	EB	T	12	-	-	-	0	0	12	-	0	4	16
	R	R	9	31	30	-1	0		9	30	-1	3	12
39 Elm St SE X St SE TMC Date: 06/25/15 Peak Hour: 5:00 - 6:00 PHF: .74	L	L	4	-	-	-	0	0	4	-	0	1	5
	WB	T	4	-	-	-	0	0	4	-	0	1	5
	R	R	2	-	-	-	0	0	2	-	0	1	3
	L	L	2	20	19	-1	0		2	19	-1	1	3
	NB	T	66	17	20	3	1		67	15	-2	24	90
	R	R	6	-	-	-	0	0	6	-	0	2	8
	L	L	0	-	-	-	0	0	0	-	0	0	0
	SB	T	44	20	25	5	1		45	18	-2	16	60
	R	R	5	0	0	0	0	0	5	0	0	2	7
			160	88	94	6	7%	2%	163	82		36%	218
	L	L	147	113	194	81	22		169	190	77		224
	EB	T	41	2	3	1	0		41	3	1		42
	R	R	28	35	53	18	5		33	42	7		35
	L	L	28	15	31	16	4		32	28	13		41
40 Capitol Blvd SE Dennis St SE/SW TMC Date: 03/05/14 Peak Hour: 4:30 - 5:15 PHF: .91	WB	T	22	2	3	1	0		22	3	1		23
	R	R	75	105	106	1	0		75	104	-1		74
	L	L	12	23	36	13	4		16	33	10		22
	NB	T	688	682	867	185	50		738	867	185		873
	R	R	23	16	25	9	2		25	33	17		40
	L	L	52	74	71	-3	-1		51	69	-5		47
	SB	T	576	763	1,198	435	117		693	1,187	424		1,000
	R	R	71	100	165	65	18		89	156	56		127
			1,763	1,930	2,752				1,984	2,715			2,548
	L	L	80	46	101	55	15		95	43	-3		77
	EB	T	131	32	144	112	30		161	183	151		282
	R	R	121	150	266	116	31		152	246	96		217
	L	L	94	0	0	0	0	10	104	0	0	47	141
	WB	T	193	6	111	105	28	21	214	98	92	97	290
41 Capitol Blvd SE Israel Rd SE/SW TMC Date: 06/25/15 Peak Hour: 4:30 - 5:30 PHF: .90	R	R	135	0	79	79	21	15	150	64	64	68	203
	L	L	106	106	153	47	13		119	183	77		183
	NB	T	317	675	748	73	20		337	826	151		468
	R	R	25	0	0	0	0		25	0	0	13	38
	L	L	71	125	304	179	48		119	187	62		133
	SB	T	514	654	882	228	61		575	1024	370		884
	R	R	88	33	96	63	17		105	47	14		102
			1,875	1,827	2,884	873	48%	11%	2,157	2,901	918	50%	3,018
	L	L	49	46	73	27	7		56	74	28		77
	EB	T	79	37	62	25	7		86	63	26		105
	R	R	0	-	-	-	0		0	-	0		0
	L	L	0	-	-	-	0		0	-	0		0
	WB	T	90	42	88	46	12		102	87	45		135
	R	R	107	25	122	97	26		133	126	101		208
42 Black Lake Belmore Rd SW 66th Ave SW TMC Date: 06/30/15 Peak Hour: 4:30 - 5:30 PHF: .95	L	L	0	-	-	-	0		0	-	0		0
	NB	T	0	-	-	-	0		0	-	0		0
	R	R	0	-	-	-	0		0	-	0		0
	L	L	69	37	89	52	14		83	92	55		124
	SB	T	0	-	-	-	0		0	-	0		0
	R	R	53	52	180	128	34		87	139	87		140
			447	239	614					581			789



Traffic Volume Calculation Worksheet
Tumwater Transportation Master Plan
PM Peak Hour Volumes

Intersection	Movement		2022 Volumes							2040 Base Model			
			EXISTING	EXISTING	2040 EXISTING	BASE	7 YEAR	BASE	PROJECTED	2040 BASE	BASE	BASE	PROJECTED
			2015	MODEL	MODEL	MODEL	GROWTH	ADJUST	2022	MODEL	MODEL	MODEL	2040
		VOLUMES	VOLUMES	VOLUMES	Δ GROWTH	GROWTH		VOLUMES	VOLUMES	Δ GROWTH	ADJUST	VOLUMES	
43 Kirsop Rd SW 66th Ave SW TMC Date: 06/30/15 Peak Hour: 4:30 - 5:30 PHF: .84	EB	L	16	21	62	41	11		27	45	24		40
		T	3	4	6	2	1		4	7	3		6
		R	130	65	120	55	15		145	139	74		204
	WB	L	2	6	9	3	1		3	10	4		6
		T	0	3	5	2	1		1	5	2		2
		R	2	3	5	2	1		3	4	1		3
	NB	L	203	50	190	140	38		241	188	138		341
		T	15	0	0	0	0		15	0	0		15
		R	2	6	11	5	1		3	10	4		6
	SB	L	3	5	9	4	1		4	9	4		7
		T	7	0	9	9	2		9	6	6		13
		R	29	37	87	50	13		42	92	55		84
		412	200	513					515			727	
44 Littlerock Rd SW Odegard Rd SW TMC Date: 06/24/15 Peak Hour: 4:30 - 5:30 PHF: .93	EB	L	0	0	0	0	0		0	0	0		0
		T	0	0	0	0	0		0	0	0		0
		R	0	0	0	0	0		0	0	0		0
	WB	L	15	0	0	0	0	1	16	0	0	8	23
		T	0	0	0	0	0		0	0	0		0
		R	5	0	0	0	0	0	5	0	0	3	8
	NB	L	0	0	0	0	0		0	0	0		0
		T	621	0	0	416	112		733	0	354		975
		R	3	0	0	0	0	0	3	0	0	2	5
	SB	L	8	0	0	0	0	1	9	0	0	4	12
		T	668	0	0	369	99		767	0	275		943
		R	0	0	0	0	0		0	0	0		0
		1,320	0	0			9%	1,534	0		50%	1,965	
45 Littlerock Rd SW Israel Rd SW/70th Ave SW TMC Date: 06/24/15 Peak Hour: 4:30 - 5:30 PHF: .95	EB	L	101	9	38	29	8		109	31	22		123
		T	80	34	78	44	12		92	78	44		124
		R	74	51	58	7	2		76	81	30		104
	WB	L	54	103	386	283	76		130	159	56		110
		T	148	35	136	101	27		175	122	87		235
		R	258	109	348	239	64		322	277	168		426
	NB	L	239	41	90	49	13		252	79	38		277
		T	257	162	283	121	33		290	311	149		406
		R	31	39	203	164	44		75	103	64		95
	SB	L	131	135	305	170	46		177	225	90		221
		T	403	336	620	284	76		479	549	213		616
		R	115	22	54	32	9		124	76	54		169
		1,891	1,076	2,599				2,301	2,091			2,906	
46 Linderson Way SE/11th Ave SW Israel Rd SW TMC Date: 06/24/15 Peak Hour: 4:30 - 5:30 PHF: .83	EB	L	40	25	114	89	24		64	54	29		69
		T	166	105	272	167	45		211	339	234		400
		R	29	60	132	72	19		48	156	96		125
	WB	L	135	15	21	6	2		137	13	-2		133
		T	259	90	258	168	45		304	297	207		466
		R	26	1	1	0	0		26	1	0		26
	NB	L	108	105	194	89	24		132	197	92		200
		T	87	76	146	70	19		106	251	175		262
		R	110	40	59	19	5		115	22	-18		92
	SB	L	38	1	1	0	0		38	1	0		38
		T	81	106	145	39	11		92	164	58		139
		R	51	35	137	102	27		78	125	90		141
		1,130	659	1,480				1,351	1,620			2,091	
47 Littlerock Rd SW Tumwater Blvd SW TMC Date: 06/24/15 Peak Hour: 4:30 - 5:30 PHF: .94	EB	L	0	-	-	-	0		0	-	0		0
		T	0	-	-	-	0		0	-	0		0
		R	0	-	-	-	0		0	-	0		0
	WB	L	224	217	487	270	73		297	387	170		394
		T	0	-	-	-	0		0	-	0		0
		R	278	129	278	149	40		318	231	102		380
	NB	L	0	-	-	-	0		0	-	0		0
		T	134	114	299	185	50		184	262	148		282
		R	105	179	415	236	64		169	296	117		222
	SB	L	306	223	420	197	53		359	320	97		403
		T	283	267	644	377	102		385	469	202		485
		R	0	-	-	-	0		0	-	0		0
		1,330	1,129	2,543				1,712	1,965			2,166	
48 I-5 SB Ramps Tumwater Blvd SW TMC Date: 06/24/15 Peak Hour: 4:30 - 5:30 PHF: .94	EB	L	0	-	-	-	0		0	-	0		0
		T	342	267	581	314	85		427	641	374		716
		R	71	140	259	119	32		103	415	275		346
	WB	L	319	473	639	166	45		364	499	26		345
		T	275	188	320	132	36		311	448	260		535
		R	0	-	-	-	0		0	-	0		0
	NB	L	0	-	-	-	0		0	-	0		0
		T	0	-	-	-	0		0	-	0		0
		R	0	-	-	-	0		0	-	0		0
	SB	L	405	285	261	-24	-6		399	263	-22		383
		T	32	0	0	0	0		32	0	0		32
		R	234	166	453	287	77		311	448	282		516
		1,678	1,519	2,513				1,947	2,714			2,873	
49 I-5 NB Ramps Tumwater Blvd SW TMC Date: 06/24/15 Peak Hour: 4:30 - 5:30 PHF: .88	EB	L	136	136	358	222	60		196	388	252		388
		T	611	415	484	69	19		630	516	101		712
		R	0	-	-	-	0		0	-	0		0
	WB	L	0	-	-	-	0		0	-	0		0
		T	550	553	767	214	58		608	703	150		700
		R	1,209	485	466	-19	-5		1,204	364	-121		1,088
	NB	L	44	107	191	84	23		67	244	137		181
		T	6	0	0	0	0		6	0	0		6
		R	135	233	297	64	17		152	280	47		182
	SB	L	0	-	-	-	0		0	-	0		0
		T	0	-	-	-	0		0	-	0		0
		R	0	-	-	-	0		0	-	0		0
		2,691	1,929	2,563				2,863	2,495			3,257	

Traffic Volume Calculation Worksheet
Tumwater Transportation Master Plan
PM Peak Hour Volumes

Intersection	Movement		2022 Volumes							2040 Base Model				
			EXISTING	EXISTING	2040 EXISTING	BASE	7 YEAR	BASE	PROJECTED	2040 BASE	BASE	BASE	PROJECTED	
			2015	MODEL	MODEL	MODEL	GROWTH	MODEL	2022	MODEL	MODEL	MODEL	2040	
		VOLUMES	VOLUMES	VOLUMES	Δ	GROWTH	ADJUST	VOLUMES	VOLUMES	Δ	GROWTH	ADJUST	VOLUMES	
50 Linderson Way SE Tumwater Blvd SW TMC Date: 03/03/15 Peak Hour: 4:30 - 5:30 PHF: .94	EB	L	135	305	285	-20	-5		130	261	-44		91	
		T	550	183	354	171	46		596	288	105		655	
	WB	R	154	161	146	-15	-4		150	250	89		243	
		L	56	72	259	187	50		106	148	76		132	
	NB	T	702	417	611	194	52		754	522	105		807	
		R	31	110	99	-11	-3		28	109	-1		30	
	SB	L	168	179	178	-1	0		168	185	6		174	
		T	84	57	126	69	19		103	109	52		136	
	SB	R	43	32	69	37	10		53	63	31		74	
		L	189	139	123	-16	-4		185	161	22		211	
	SB	T	161	70	158	88	24		185	145	75		236	
		R	878	438	436	-2	-1		877	352	-86		792	
			3,151	2,163	2,844				3,335	2,593			3,581	
51 New Market St SW Tumwater Blvd SW TMC Date: 03/03/15 Peak Hour: 4:30 - 5:30 PHF: .92	EB	L	27	59	126	67	18		45	124	65		92	
		T	773	294	420	126	34		807	388	94		867	
	WB	R	19	-	-	-	0	6	25	-	0	9	28	
		L	45	-	-	-	0	14	59	-	0	21	66	
	NB	T	681	492	740	248	67		748	554	62		743	
		R	9	45	106	61	16		25	97	52		61	
	SB	L	16	-	-	-	0	5	21	-	0	7	23	
		T	2	-	-	-	0	1	3	-	0	1	3	
	SB	R	46	-	-	-	0	14	60	-	0	21	67	
		L	31	46	136	90	24		55	135	89		120	
	SB	T	16	-	-	-	0	5	21	-	0	7	23	
		R	104	108	229	121	33		137	225	117		221	
			1,769	1,044	1,757	713	131%	30%	2,005	1,523	479	46%	2,314	
52 Capitol Blvd SE Tumwater Blvd SE TMC Date: 06/24/15 Peak Hour: 4:30 - 5:30 PHF: .90	EB	L	64	37	135	98	26		90	146	109		173	
		T	305	276	358	82	22		327	319	43		348	
	WB	R	244	91	-	-	0		244	145	54		298	
		L	83	0	-	-	0	4	87	0	0	29	112	
	NB	T	325	396	457	61	16		341	417	21		346	
		R	15	275	189	-86	-23	1	16	182	-93	5	20	
	SB	L	199	75	-	-	0		199	101	26		225	
		T	304	469	-	-	0		304	680	211		515	
	SB	R	18	0	-	-	0	1	19	0	0		18	
		L	112	125	159	34	9		121	0	-125	39	151	
	SB	T	475	546	-	-	0		475	1050	504		979	
		R	106	133	389	256	69		175	221	88		194	
			2,250	2,423	1,687	445	18%	4%		3,261	838	35%	3,379	
53 Wildflower St SE/65th Ave SE Henderson Blvd SE TMC Date: 07/01/15 Peak Hour: 4:30 - 5:30 PHF: .91	EB	L	2	4	12	8	2		4	12	8		10	
		T	843	475	574	99	27		870	534	59		902	
	WB	R	54	45	97	52	14		68	95	50		104	
		L	64	68	123	55	15		79	125	57		121	
	NB	T	526	529	672	143	39		565	646	117		643	
		R	1	7	18	11	3		4	18	11		12	
	SB	L	26	34	69	35	9		35	65	31		57	
		T	0	0	0	0	0		0	0	0		0	
	SB	R	46	37	69	32	9		55	74	37		83	
		L	1	4	11	7	2		3	12	8		9	
	SB	T	0	0	0	0	0		0	0	0		0	
		R	0	3	9	6	2		2	8	5		5	
			1,563	1,206	1,654				687	1,589			1,946	
54 Tumwater Blvd SE Henderson Blvd SE TMC Date: 11/13/14 Peak Hour: 4:30 - 5:30 PHF: .91	EB	L	651	399	532	133	36		687	502	103		754	
		T	0	-	-	-	0		0	-	0		0	
	WB	R	12	29	100	71	19		31	10	-19	12	5	
		L	0	-	-	-	0		0	-	0		0	
	NB	T	0	-	-	-	0		0	-	0		0	
		R	0	-	-	-	0		0	-	0		0	
	SB	L	22	4	10	6	2		24	10	6		28	
		T	165	126	151	25	7		172	139	13		178	
	SB	R	0	-	-	-	0		0	-	0		0	
		L	0	-	-	-	0		0	-	0		0	
	SB	T	197	156	226	70	19		216	257	101		298	
		R	323	410	524	114	31		354	462	52		375	
			1,370	1,124	1,543				1,484	1,380			1,638	
55 Trails End Dr SE Henderson Blvd SE TMC Date: 06/24/15 Peak Hour: 5:00 - 6:00 PHF: .87	EB	L	0	-	-	-	0		0	-	0		0	
		T	152	74	95	21	6		158	91	17		169	
	WB	R	88	70	90	20	5		93	124	54		142	
		L	97	108	219	111	30		127	120	12		109	
	NB	T	139	77	107	30	8		147	146	69		208	
		R	0	-	-	-	0		0	-	0		0	
	SB	L	53	68	90	22	6		59	94	26		79	
		T	0	-	-	-	0		0	-	0		0	
	SB	R	52	56	66	10	3		55	58	2		54	
		L	0	-	-	-	0		0	-	0		0	
	SB	T	0	-	-	-	0		0	-	0		0	
		R	0	-	-	-	0		0	-	0		0	
			581	453	667				639	633			761	
56 Littlerock Rd SW Black Hills High School Drwy TMC Date: 06/24/15 Peak Hour: 4:30 - 5:30 PHF: .96	EB	L	4	143	275	132	36	1	5	277	134	2	6	
		T	0	0	3	3	1	0	0	3	3	25	25	
	WB	R	7	31	103	72	19	1	8	101	70	4	11	
		L	0	4	53	49	13	0	0	52	48	100	100	
	NB	T	0	0	2	2	1	0	0	2	2	50	50	
		R	0	22	144	122	33	0	0	35	13	25	25	
	SB	L	9	21	102	81	22	1	10	95	74	5	14	
		T	158	129	295	166	45		203	246	117		275	
	SB	R	0	4	64	60	16	0	0	61	57	50	50	
		L	0	36	0	-36	-10	0	0	43	7	25	25	
	SB	T	390	259	490	231	62		452	403	144		534	
		R	48	188	400	212	57	7	55	408	220	24	72	
			616	837	1,931			14%	733	1,726		50%	1,186	



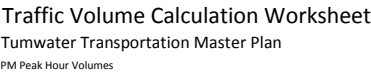
Traffic Volume Calculation Worksheet
Tumwater Transportation Master Plan
PM Peak Hour Volumes

Intersection	Movement		2022 Volumes							2040 Base Model				
			EXISTING	EXISTING	2040 EXISTING	BASE	7 YEAR	BASE	PROJECTED	2040 BASE	BASE	BASE	PROJECTED	
			2015	MODEL	MODEL	MODEL	GROWTH	MODEL	2022	MODEL	MODEL	MODEL	2040	
			VOLUMES	VOLUMES	VOLUMES	Δ GROWTH			VOLUMES	VOLUMES	Δ GROWTH	ADJUST	VOLUMES	
57 Center St SW 76th Ave SW TMC Date: 03/03/15 Peak Hour: 4:45 - 5:45 PHF: .92	EB	L	48	42	88	46	12		60	78	36		84	
		T	9	-	-	-	0		9	-	0	5	14	
		R	1	0	0	0	0		1	0	0	1	2	
	WB	L	8	-	-	-	0		8	-	0	5	13	
		T	9	-	-	-	0		9	-	0	5	14	
		R	21	-	-	-	0		21	-	0	12	33	
	NB	L	1	0	0	0	0		1	0	0	1	2	
		T	247	225	286	61	16		263	279	54		301	
		R	0	-	-	-	0		0	-	0	0	0	
	SB	L	10	-	-	-	0		10	-	0	6	16	
		T	311	247	334	87	23		334	361	114		425	
		R	38	56	228	172	46		84	183	127		165	
58 Old Hwy 99 Henderson Blvd SE TMC Date: 06/23/15 Peak Hour: 4:15 - 5:15 PHF: .87	EB	L	703	570	936	-	-		800	901	331	58%	1,068	
		T	16	-	-	-	0		16	-	0	9	25	
		R	6	-	-	-	0		6	-	0	3	9	
	WB	L	7	-	-	-	0		7	-	0	4	11	
		T	142	75	102	27	7		149	140	65		207	
		R	6	-	-	-	0		6	-	0	3	9	
	NB	L	51	70	95	25	7		58	100	30		81	
		T	2	-	-	-	0		2	-	0	1	3	
		R	512	544	640	96	26		538	755	211		723	
	SB	L	111	71	91	20	5		116	87	16		127	
		T	105	73	94	21	6		111	127	54		159	
		R	813	666	855	189	51		864	1205	539		1,352	
	L	11	-	-	-	0		11	-	0	6	17		
			1,782	1,499	1,877	-	-		1,884	2,414	165	57%	2,724	
	59 Old Hwy 99 79th Ave SE TMC Date: 10/28/14 Peak Hour: 4:30 - 5:30 PHF: .95	EB	L	1	-	-	-	0		1	-	0	0	1
T			1	-	-	-	0		1	-	0	0	1	
R			10	-	-	-	0		10	-	0	1	11	
WB		L	11	64	84	20	5		16	83	19		30	
		T	0	-	-	-	0		0	-	0	0	0	
		R	111	73	82	9	2		113	86	13		124	
NB		L	1	-	-	-	0		1	-	0	0	1	
		T	432	543	650	107	29		461	756	213		645	
		R	15	53	61	8	2		17	60	7		22	
SB		L	131	68	1	-67	-18		113	67	-1		130	
		T	841	672	956	284	76		917	1279	607		1,448	
		R	0	-	-	-	0		0	-	0	0	0	
			1,554	1,473	1,834	-	-		1,650	2,331	38	15%	2,414	
	60 Kimmie St SW 83rd Ave SW TMC Date: 03/03/15 Peak Hour: 4:30 - 5:30 PHF: .82	EB	L	0	-	-	-	0		0	-	0		0
			T	0	-	-	-	0		0	-	0		0
R			0	-	-	-	0		0	-	0		0	
WB		L	43	63	78	15	4		47	73	10		53	
		T	0	-	-	-	0		0	-	0		0	
		R	17	0	0	0	0		17	0	0		17	
NB		L	0	-	-	-	0		0	-	0		0	
		T	29	49	94	45	12		41	84	35		64	
		R	16	36	34	-2	-1		15	34	-2		14	
SB		L	3	0	0	0	0		3	0	0		3	
		T	62	73	267	194	52		114	221	148		210	
		R	0	-	-	-	0		0	-	0		0	
61 Center St SW 83rd Ave SW TMC Date: 03/03/15 Peak Hour: 4:45 - 5:45 PHF: .88	EB	L	170	221	473	-	-		237	412			361	
		T	70	36	34	-2	-1		69	34	-2		68	
		R	25	10	0	-10	-3		22	0	-10		15	
	WB	L	0	-	-	-	0		0	-	0		0	
		T	0	-	-	-	0		0	-	0		0	
		R	11	4	5	1	0		11	5	1		12	
	NB	L	89	77	148	71	19		108	126	49		138	
		T	0	-	-	-	0		0	-	0		0	
		R	0	-	-	-	0		0	-	0		0	
	SB	L	156	191	359	168	45		201	309	118		274	
		T	0	-	-	-	0		0	-	0		0	
		R	72	63	78	15	4		76	73	10		82	
62 Old Hwy 99 88th Ave SE TMC Date: 06/23/15 Peak Hour: 4:30 - 5:30 PHF: .90	EB	L	423	381	624	-	-		487	547			589	
		T	179	170	201	31	8	18	205	230	60		239	
		R	7	-	-	-	0	1	8	-	0		7	
	WB	L	25	19	18	-1	0	2	27	18	-1		24	
		T	2	-	-	-	0	0	2	-	0		2	
		R	4	-	-	-	0	0	4	-	0		4	
	NB	L	1	-	-	-	0	0	1	-	0		1	
		T	6	13	18	5	1	1	8	14	1		7	
		R	269	357	417	60	16	27	312	486	129		398	
	SB	L	0	-	-	-	0	0	0	-	0		0	
		T	0	-	-	-	0	0	0	-	0		0	
		R	671	487	659	172	46	67	784	748	261		932	
	L	173	174	285	111	30	17	220	510	336		509		
			1,337	1,220	1,598	-	-		2,006				2,123	
	63 I-5 SB Ramps 93rd Ave SW TMC Date: 06/23/15 Peak Hour: 5:00 - 6:00 PHF: .88	EB	L	0	-	-	-	0		0	-	0		0
T			296	259	371	112	30		326	376	117		413	
R			32	51	107	56	15		47	115	64		96	
WB		L	143	166	111	-55	-15		128	107	-59		84	
		T	124	127	341	214	58		182	309	182		306	
		R	0	-	-	-	0		0	-	0		0	
NB		L	0	-	-	-	0		0	-	0		0	
		T	0	-	-	-	0		0	-	0		0	
		R	0	-	-	-	0		0	-	0		0	
SB		L	499	491	563	72	19		518	466	-25		474	
		T	0	0	0	0	0		0	0	0		0	
		R	283	246	362	116	31		314	386	140		423	
			1,377	1,340	1,855	-	-		1,759				1,796	



Traffic Volume Calculation Worksheet
Tumwater Transportation Master Plan
PM Peak Hour Volumes

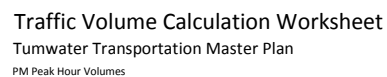
Intersection	Movement		2022 Volumes							2040 Base Model			
			EXISTING	EXISTING	2040 EXISTING	BASE	7 YEAR	BASE	PROJECTED	2040 BASE	BASE	BASE	PROJECTED
			2015	MODEL	MODEL	MODEL	GROWTH	ADJUST	2022	MODEL	MODEL	MODEL	2040
			VOLUMES	VOLUMES	VOLUMES	Δ GROWTH			VOLUMES	VOLUMES	Δ GROWTH	ADJUST	VOLUMES
64 I-5 NB Ramps 93rd Ave SW TMC Date: 06/23/15 Peak Hour: 4:30 - 5:30 PHF: .94	EB	L	246	190	248	58	16		262	233	43		289
		T	504	560	686	126	34		538	609	49		553
	R		0	-	-	-	0		0	-	0		0
		L	0	-	-	-	0		0	-	0		0
	WB	T	251	247	323	76	20		271	286	39		290
		R	339	294	400	106	29		368	382	88		427
	L		47	46	129	83	22		69	129	83		130
		T	0	0	0	0	0		0	0	0		0
	R		113	131	172	41	11		124	171	40		153
		L	0	-	-	-	0		0	-	0		0
SB	T	0	-	-	-	0		0	-	0		0	
	R	0	-	-	-	0		0	-	0		0	
			1,500	1,468	1,958				1,632	1,810			1,842
65 Kimmie St SW 93rd Ave SW TMC Date: 06/23/15 Peak Hour: 4:15 - 5:15 PHF: .94	EB	L	25	134	164	30	8		33	162	28		53
		T	462	518	662	144	39		501	591	73		535
	R		15	39	32	-7	-2		13	27	-12		3
		L	3	0	0	0	0		3	0	0		3
	WB	T	408	317	414	97	26		434	382	65		473
		R	6	11	18	7	2		8	18	7		13
	L		15	36	34	-2	-1		14	34	-2		13
		T	1	1	6	5	1		2	1	0		1
	R		10	0	0	0	0		10	0	0		10
		L	5	18	72	54	15		20	41	23		28
SB	T	4	8	15	7	2		6	19	11		15	
	R	48	188	274	86	23		71	252	64		112	
			1,002	1,270	1,691				1,115	1,527			1,259
66 Case Rd SW 93rd Ave SW TMC Date: 06/23/15 Peak Hour: 4:30 - 5:30 PHF: .92	EB	L	2	0	0	0	0		2	0	0		2
		T	316	355	550	195	53		369	475	120		436
	R		167	159	160	1	0		167	134	-25		142
		L	54	71	262	191	51		105	255	184		238
	WB	T	295	190	282	92	25		320	253	63		358
		R	28	48	115	67	18		46	87	39		67
	L		82	122	128	6	2		84	123	1		83
		T	19	40	51	11	3		22	58	18		37
	R		32	59	71	12	3		35	78	19		51
		L	51	122	282	160	43		94	212	90		141
SB	T	48	86	100	14	4		52	120	34		82	
	R	1	0	0	0	0		1	0	0		1	
			1,095	1,252	2,001				1,297	1,795			1,638
67 Tilley Rd SW (south leg) 93rd Ave SW TMC Date: 06/23/15 Peak Hour: 4:30 - 5:30 PHF: .87	EB	L	0	-	-	-	0		0	-	0		0
		T	238	247	490	243	65		303	395	148		386
	R		157	290	413	123	33		190	370	80		237
		L	86	66	119	53	14		100	245	179		265
	WB	T	236	236	531	295	79		315	485	249		485
		R	0	-	-	-	0		0	-	0		0
	L		132	73	129	56	15		147	110	37		169
		T	0	-	-	-	0		0	-	0		0
	R		65	57	68	11	3		68	79	22		87
		L	0	-	-	-	0		0	-	0		0
SB	T	0	-	-	-	0		0	-	0		0	
	R	0	-	-	-	0		0	-	0		0	
			914	969	1,750				1,123	1,684			1,629
68 Tilley Rd SW (north leg) 93rd AVE SW TMC Date: 06/23/15 Peak Hour: 4:30 - 5:30 PHF: .86	EB	L	113	114	108	-6	-2		111	116	2		115
		T	190	190	450	260	70		260	358	168		358
	R		0	0	0	0	0		0	0	0		0
		L	0	3	3	0	0		0	3	0		0
	WB	T	94	169	477	308	83		177	415	246		340
		R	12	14	51	37	10		22	68	54		66
	L		0	0	0	0	0		0	0	0		0
		T	0	0	3	3	1		1	3	3		3
	R		0	0	2	2	1		1	2	2		2
		L	14	23	108	85	23		37	179	156		170
SB	T	0	4	5	1	0		0	7	3		3	
	R	227	133	172	39	11		238	315	182		409	
			650	650	1,379				847	1,466			1,466
69 Old Hwy 99 SE 93rd Ave SW TMC Date: 06/23/15 Peak Hour: 4:30 - 5:30 PHF: .92	EB	L	16	4	3	-1	0		16	5	1		17
		T	0	-	-	-	0		0	-	0		0
	R		155	123	196	73	20		175	171	48		203
		L	0	-	-	-	0		0	-	0		0
	WB	T	0	-	-	-	0		0	-	0		0
		R	0	-	-	-	0		0	-	0		0
	L		70	114	284	170	46		116	236	122		192
		T	213	366	433	67	18		231	495	129		342
	R		0	-	-	-	0		0	-	0		0
		L	0	-	-	-	0		0	-	0		0
SB	T	630	503	672	169	46		676	761	258		888	
	R	28	4	5	1	0		28	6	2		30	
			1,112	1,114	1,593	479	43%	10%	1,242	1,674			1,672

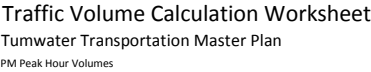


Traffic Volume Calculation Worksheet

Tumwater Transportation Master Plan

PM Peak Hour Volumes

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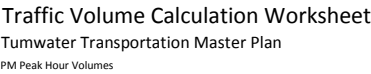


PM Peak Hour Volumes

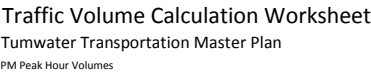


Traffic Volume Calculation Worksheet
 Tumwater Transportation Master Plan
 PM Peak Hour Volumes

Intersection	Movement	Link Volumes				Link Capacity						Volume to Capacity Ratio					
		Existing		2040 Baseline		Existing		2040 Baseline		2040 With Imp		Existing		2040 Baseline		2040 With Imp	
		APPROACH LINK	DEPART LINK	APPROACH LINK	DEPART LINK	APPROACH LINK	DEPART LINK	APPROACH LINK	DEPART LINK	APPROACH LINK	DEPART LINK	APPROACH LINK	DEPART LINK	APPROACH LINK	DEPART LINK	APPROACH LINK	DEPART LINK
13 I-5 SB/US 101 EB Off Ramps/N 2nd Ave SW Desoto St SW TMC Date: 06/30/15 Peak Hour: 4:30 - 5:30 PHF: .89	EB	151	215	206	304	450	450	450	450	450	450	0.34	0.48	0.46	0.68	0.46	0.68
	WB	0	0	0	0	0	0	0	0	0	0						
	NB	172	955	274	1,139	750	1500	750	1500	750	1500	0.23	0.64	0.37	0.76	0.37	0.76
	SB	847	0	963	0	2120	2120	2120	2120	2120	2120	0.40	0.00	0.45	0.00	0.45	0.00
		1,170															
	EB	0	0	0	0	0	0	0	0	0	0						
	WB	275	963	499	1,235	900	1800	900	1800	900	1800	0.31	0.54	0.55	0.69	0.55	0.69
14 N 2nd Ave SW Custer Way SW TMC Date: 02/10/15 Peak Hour: 4:45 - 5:45 PHF: .88	NB	172	353	333	549	750	750	750	750	750	750	0.23	0.47	0.44	0.73	0.44	0.73
	SB	1,043	174	1,228	276	1500	750	1500	750	1500	750	0.70	0.23	0.82	0.37	0.82	0.37
		1,490															
	EB	876	262	1,259	544	1800	900	1800	900	1800	900	0.49	0.29	0.70	0.60	0.70	0.60
	WB	632	859	780	1,111	900	1800	900	1800	900	1800	0.70	0.48	0.87	0.62	0.87	0.62
	NB	151	539	116	502	450	450	450	450	450	450	0.34	1.20	0.26	1.12	0.26	1.12
	SB	5	4	5	3	450	450	450	450	450	450	0.01	0.01	0.01	0.01	0.01	0.01
15 Boston St SW Custer Way SW TMC Date: 06/25/15 Peak Hour: 4:30 - 5:30 PHF: .95		1,664															
	EB	0	0	0	0	0	0	0	0	0	0						
	WB	508	163	471	168	450	450	450	450	450	450	1.13	0.36	1.05	0.37	1.05	0.37
	NB	424	281	686	470	550	550	550	550	550	550	0.77	0.51	1.25	0.85	1.25	0.85
	SB	288	776	390	909	550	550	550	550	550	550	0.52	1.41	0.71	1.65	0.71	1.65
		1,220															
	EB	0	0	0	0	0	0	0	0	0	0						
16 Deschutes Way SW Boston St SW TMC Date: 07/01/15 Peak Hour: 4:30 - 5:30 PHF: .93	WB	508	163	471	168	450	450	450	450	450	450	1.13	0.36	1.05	0.37	1.05	0.37
	NB	424	281	686	470	550	550	550	550	550	550	0.77	0.51	1.25	0.85	1.25	0.85
	SB	288	776	390	909	550	550	550	550	550	550	0.52	1.41	0.71	1.65	0.71	1.65
		1,220															
	EB	0	0	0	0	0	0	0	0	0	0						
	WB	508	163	471	168	450	450	450	450	450	450	1.13	0.36	1.05	0.37	1.05	0.37
	NB	424	281	686	470	550	550	550	550	550	550	0.77	0.51	1.25	0.85	1.25	0.85



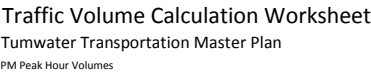
		Link Volumes				Link Capacity						Volume to Capacity Ratio					
Intersection	Movement	Existing		2040 Baseline		Existing		2040 Baseline		2040 With Imp		Existing		2040 Baseline		2040 With Imp	
		APPROACH LINK	DEPART LINK	APPROACH LINK	DEPART LINK	APPROACH LINK	DEPART LINK	APPROACH LINK	DEPART LINK	APPROACH LINK	DEPART LINK	APPROACH LINK	DEPART LINK	APPROACH LINK	DEPART LINK	APPROACH LINK	DEPART LINK
17 Cleveland Ave SE Capitol Blvd SE TMC Date: 06/25/15 Peak Hour: 4:30 - 5:30 PHF: .88																	
	EB	350	551	767	1,205	1800	1800	900	1800	900	1800	0.19	0.31	0.85	0.67	0.85	0.67
	WB	914	556	1,648	1,046	1800	1800	1800	1800	1800	1800	0.51	0.31	0.92	0.58	0.92	0.58
	NB	224	381	297	461	900	900	750	750	750	750	0.25	0.42	0.40	0.61	0.40	0.61
	SB	0	0	0	0	0	0	0	0	0	0						
		1,488															
18 Custer Way SE Capitol Blvd SE TMC Date: 02/10/15 Peak Hour: 4:45 - 5:45 PHF: .90																	
	EB	865	593	1,117	741	1800	900	1800	900	1800	900	0.48	0.66	0.62	0.82	0.62	0.82
	WB	790	1092	612	900	1800	1800	900	1800	900	1800	0.44	0.61	0.68	0.50	0.68	0.50
	NB	776	816	740	1,129	1800	1800	900	1800	900	1800	0.43	0.45	0.82	0.63	0.82	0.63
	SB	545	475	1,199	898	1800	1800	1800	900	1800	900	0.44	0.61	0.68	0.50	0.68	0.50
		2,976															
19 Custer Way SE/North St SE Cleveland Ave SE TMC Date: 02/10/15 Peak Hour: 4:45 - 5:45 PHF: .93																	
	EB	1,025	832	846	699	1800	1800	1800	900	1800	900	0.57	0.46	0.47	0.78	0.47	0.78
	WB	329	453	479	603	750	750	750	750	750	750	0.44	0.60	0.64	0.80	0.64	0.80
	NB	629	936	386	675	1800	1800	900	1800	900	1800	0.35	0.52	0.43	0.38	0.43	0.38
	SB	491	253	614	348	900	900	750	750	750	750	0.55	0.28	0.82	0.46	0.82	0.46
		2,474															
20 Hoadley St SE North St SE TMC Date: 06/24/15 Peak Hour: 5:00 - 6:00 PHF: .87																	
	EB	318	411	555	615	750	750	750	750	750	750	0.42	0.55	0.74	0.82	0.74	0.82
	WB	455	301	685	528	750	750	750	750	750	750	0.61	0.40	0.91	0.70	0.91	0.70
	NB	9	13	14	20	450	450	450	450	450	450	0.02	0.03	0.03	0.05	0.03	0.05
	SB	43	100	68	158	450	450	450	450	450	450	0.10	0.22	0.15	0.35	0.15	0.35
		825															



Traffic Volume Calculation Worksheet

Tumwater Transportation Master Plan

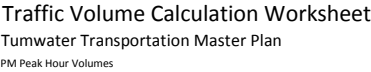
PM Peak Hour Volumes



Traffic Volume Calculation Worksheet

Tumwater Transportation Master Plan

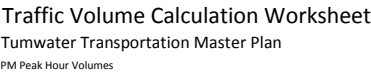
PM Peak Hour Volumes



Tumwater Transportation Master Plan

PM Peak Hour Volumes

		Link Volumes				Link Capacity						Volume to Capacity Ratio					
		Existing		2040 Baseline		Existing		2040 Baseline		2040 With Imp		Existing		2040 Baseline		2040 With Imp	
Intersection	Movement	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART
		LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK
29 Lake Park Dr Trosper Rd SW TMC Date: 03/05/14 Peak Hour: 4:45 - 5:45 PHF: .98																	
	EB	306	444	480	630	550	550	550	550	650	650	0.56	0.81	0.87	1.15	0.74	0.97
	WB	472	347	758	645	1100	1100	1100	1100	1100	1100	0.43	0.32	0.69	0.59	0.69	0.59
	NB	143	114	177	141	450	450	450	450	450	450	0.32	0.25	0.39	0.31	0.39	0.31
	SB	72	88	199	197	450	450	450	450	450	450	0.16	0.20	0.44	0.44	0.44	0.44
		993															
30 2nd Ave SW/Littlerock Rd SW Trosper Rd SW TMC Date: 03/05/14 Peak Hour: 4:00 - 5:00 PHF: .98																	
	EB	413	528	697	802	1100	1100	1100	1100	1100	1100	0.38	0.48	0.63	0.73	0.63	0.73
	WB	697	760	815	1,072	1500	1500	1500	1500	1500	1500	0.46	0.51	0.54	0.71	0.54	0.71
	NB	799	713	1,213	1,096	1800	1800	1800	1800	1800	1800	0.44	0.40	0.67	0.61	0.67	0.61
	SB	380	288	763	518	750	750	750	750	750	750	0.46	0.51	0.54	0.71	0.54	0.71
		2,289															
31 I-5 SB Ramps/Tyee Dr Trosper Rd SW TMC Date: 03/05/14 Peak Hour: 4:30 - 5:30 PHF: .95																	
	EB	715	724	1,034	847	1500	1500	1500	1500	1500	1500	0.48	0.48	0.69	0.56	0.69	0.56
	WB	757	1335	1,014	1,624	1500	1500	1500	1500	1500	1500	0.50	0.89	0.68	1.08	0.68	1.08
	NB	518	590	625	734	550	550	550	550	550	550	0.94	1.07	1.14	1.33	1.14	1.33
	SB	1,164	505	1,293	761	4240	1060	4240	1060	4240	1060	0.27	0.48	0.30	0.72	0.30	0.72
		3,154															
32 I-5 NB Ramps Trosper Rd SW TMC Date: 03/05/14 Peak Hour: 4:30 - 5:30 PHF: .93																	
	EB	1,340	760	1,694	1,014	2250	1500	2250	1500	2250	1500	0.60	0.51	0.75	0.68	0.75	0.68
	WB	1205	895	1,426	1,174	1500	2250	1500	1500	1500	1500	0.80	0.40	0.95	0.78	0.95	0.78
	NB	251	524	145	665	1060	1060	550	550	550	550	0.24	0.49	0.26	1.21	0.26	1.21
	SB	0	617	0	412	1060	1060	1060	1060	1060	1060	0.00	0.58	0.00	0.39	0.00	0.39
		2,796															

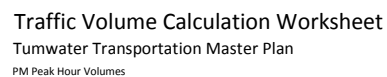


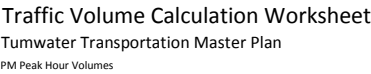
PM Peak Hour Volumes



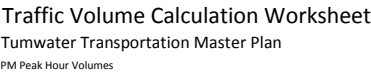
Traffic Volume Calculation Worksheet
 Tumwater Transportation Master Plan
 PM Peak Hour Volumes

Intersection	Movement	Link Volumes				Link Capacity						Volume to Capacity Ratio					
		Existing		2040 Baseline		Existing		2040 Baseline		2040 With Imp		Existing		2040 Baseline		2040 With Imp	
		APPROACH LINK	DEPART LINK	APPROACH LINK	DEPART LINK	APPROACH LINK	DEPART LINK	APPROACH LINK	DEPART LINK	APPROACH LINK	DEPART LINK	APPROACH LINK	DEPART LINK	APPROACH LINK	DEPART LINK	APPROACH LINK	DEPART LINK
37 Littlerock Rd SW Kingswood Dr SW TMC Date: 06/24/15 Peak Hour: 4:30 - 5:30 PHF: .93	EB	0	0	0	0	0	0	0	0	0	0						
	WB	253	184	287	249	550	550	550	550	550	550	0.46	0.33	0.52	0.45	0.52	0.45
	NB	621	697	1,008	977	1100	1100	1100	1100	1100	1100	0.56	0.63	0.92	0.89	0.92	0.89
	SB	578	571	885	954	1800	1800	1800	1800	1800	1800	0.32	0.32	0.49	0.53	0.49	0.53
		1,452															
	EB	39	56	53	76	450	450	450	450	450	450	0.09	0.12	0.12	0.17	0.12	0.17
	WB	32	49	56	56	450	450	450	450	450	450	0.07	0.11	0.13	0.13	0.13	0.13
38 Capitol Blvd SE X St SE TMC Date: 03/05/14 Peak Hour: 4:15 - 5:15 PHF: .89	NB	936	738	1,239	1,245	1800	1800	2100	2100	2100	2100	0.52	0.41	0.59	0.59	0.59	0.59
	SB	783	947	1,271	1,242	1800	1800	2100	2100	2100	2100	0.44	0.53	0.61	0.59	0.61	0.59
		1,790															
	EB	27	11	37	15	450	450	450	450	450	450	0.06	0.02	0.08	0.03	0.08	0.03
	WB	10	18	14	24	450	450	450	450	450	450	0.02	0.04	0.03	0.05	0.03	0.05
	NB	74	57	101	78	450	450	450	450	450	450	0.16	0.13	0.22	0.17	0.22	0.17
	SB	49	74	67	101	450	450	450	450	450	450	0.11	0.16	0.15	0.22	0.15	0.22
39 Elm St SE X St SE TMC Date: 06/25/15 Peak Hour: 5:00 - 6:00 PHF: .74		160															
	EB	216	105	301	172	450	450	450	450	450	450	0.48	0.23	0.67	0.38	0.67	0.38
	WB	125	116	138	129	450	450	450	450	450	450	0.28	0.26	0.31	0.29	0.31	0.29
	NB	723	632	935	1,076	1800	1800	2100	2100	2100	2100	0.40	0.35	0.45	0.51	0.45	0.51
	SB	699	910	1,174	1,171	1800	1800	2100	2100	2100	2100	0.39	0.51	0.56	0.56	0.56	0.56
		1,763															
	EB	216	105	301	172	450	450	450	450	450	450	0.48	0.23	0.67	0.38	0.67	0.38
40 Capitol Blvd SE Dennis St SE/SW TMC Date: 03/05/14 Peak Hour: 4:30 - 5:15 PHF: .91	WB	125	116	138	129	450	450	450	450	450	450	0.28	0.26	0.31	0.29	0.31	0.29
	NB	723	632	935	1,076	1800	1800	2100	2100	2100	2100	0.40	0.35	0.45	0.51	0.45	0.51
	SB	699	910	1,174	1,171	1800	1800	2100	2100	2100	2100	0.39	0.51	0.56	0.56	0.56	0.56
		1,763															
	EB	216	105	301	172	450	450	450	450	450	450	0.48	0.23	0.67	0.38	0.67	0.38
	WB	125	116	138	129	450	450	450	450	450	450	0.28	0.26	0.31	0.29	0.31	0.29
	NB	723	632	935	1,076	1800	1800	2100	2100	2100	2100	0.40	0.35	0.45	0.51	0.45	0.51

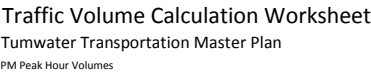
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		Link Volumes				Link Capacity						Volume to Capacity Ratio					
Intersection	Movement	Existing		2040 Baseline		Existing		2040 Baseline		2040 With Imp		Existing		2040 Baseline		2040 With Imp	
		APPROACH LINK	DEPART LINK	APPROACH LINK	DEPART LINK	APPROACH LINK	DEPART LINK	APPROACH LINK	DEPART LINK	APPROACH LINK	DEPART LINK	APPROACH LINK	DEPART LINK	APPROACH LINK	DEPART LINK	APPROACH LINK	DEPART LINK
45 Littlerock Rd SW Israel Rd SW/70th Ave SW TMC Date: 06/24/15 Peak Hour: 4:30 - 5:30 PHF: .95																	
	EB	255	502	351	681	450	450	450	450	450	450	0.57	1.12	0.78	1.51	0.78	1.51
	WB	460	242	771	440	750	750	750	750	750	750	0.61	0.32	1.03	0.59	1.03	0.59
	NB	527	531	778	830	1100	2000	1100	2000	1100	2000	0.48	0.27	0.71	0.42	0.71	0.42
	SB	649	616	1,006	955	1100	1100	1100	1100	1100	1100	0.59	0.56	0.91	0.87	0.91	0.87
		1,891															
46 Linderson Way SE/11th Ave SW Israel Rd SW TMC Date: 06/24/15 Peak Hour: 4:30 - 5:30 PHF: .83																	
	EB	235	418	594	807	750	750	750	750	750	750	0.31	0.56	0.79	1.08	0.79	1.08
	WB	420	314	625	530	750	750	750	750	750	750	0.56	0.42	0.83	0.71	0.83	0.71
	NB	305	245	554	397	550	550	550	550	550	550	0.55	0.45	1.01	0.72	1.01	0.72
	SB	170	153	318	357	550	550	550	550	550	550	0.31	0.28	0.58	0.65	0.58	0.65
		1,130															
47 Littlerock Rd SW Tumwater Blvd SW TMC Date: 06/24/15 Peak Hour: 4:30 - 5:30 PHF: .94																	
	EB	0	0	0	0	0	0	0	0	0	0						
	WB	502	411	774	625	900	900	900	900	900	900	0.56	0.46	0.86	0.69	0.86	0.69
	NB	239	507	504	879	750	750	750	750	900	900	0.32	0.68	0.67	1.17	0.56	0.98
	SB	589	412	888	662	2000	1100	2000	1100	2000	1100	0.29	0.37	0.44	0.60	0.44	0.60
		1,330															
48 I-5 SB Ramps Tumwater Blvd SW TMC Date: 06/24/15 Peak Hour: 4:30 - 5:30 PHF: .94																	
	EB	413	509	1,062	1,051	1500	750	1500	1500	1500	1500	0.28	0.68	0.71	0.70	0.71	0.70
	WB	594	747	880	1,099	900	1800	1800	1800	1800	1800	0.66	0.42	0.49	0.61	0.49	0.61
	NB	0	422	0	723	1060	1060	1060	1060	1060	1060	0.00	0.40	0.00	0.68	0.00	0.68
	SB	671	0	931	0	1060	1060	1060	1060	1060	1060	0.66	0.42	0.49	0.61	0.49	0.61
		1,678															



PM Peak Hour Volumes

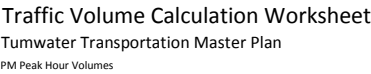


PM Peak Hour Volumes

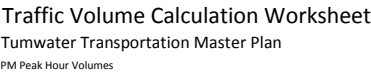


Traffic Volume Calculation Worksheet
 Tumwater Transportation Master Plan
 PM Peak Hour Volumes

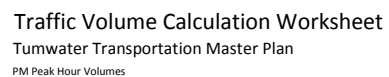
Intersection	Movement	Link Volumes				Link Capacity						Volume to Capacity Ratio					
		Existing		2040 Baseline		Existing		2040 Baseline		2040 With Imp		Existing		2040 Baseline		2040 With Imp	
		APPROACH LINK	DEPART LINK	APPROACH LINK	DEPART LINK	APPROACH LINK	DEPART LINK	APPROACH LINK	DEPART LINK	APPROACH LINK	DEPART LINK	APPROACH LINK	DEPART LINK	APPROACH LINK	DEPART LINK	APPROACH LINK	DEPART LINK
57 Center St SW 76th Ave SW TMC Date: 03/03/15 Peak Hour: 4:45 - 5:45 PHF: .92	EB	58	48	100	181	450	450	450	450	450	450	0.13	0.11	0.22	0.40	0.22	0.40
	WB	38	19	60	30	450	450	450	450	450	450	0.08	0.04	0.13	0.07	0.13	0.07
	NB	248	320	303	439	550	550	550	550	550	550	0.45	0.58	0.55	0.80	0.55	0.80
	SB	359	316	606	418	550	550	550	550	550	550	0.65	0.57	1.10	0.76	1.10	0.76
		703															
	EB	29	19	46	30	450	450	450	450	450	450	0.06	0.04	0.10	0.07	0.10	0.07
	WB	199	222	297	295	750	750	750	750	750	750	0.27	0.30	0.40	0.39	0.40	0.39
58 Old Hwy 99 Henderson Blvd SE TMC Date: 06/23/15 Peak Hour: 4:15 - 5:15 PHF: .87	NB	625	962	853	1,570	900	900	900	900	1950	1950	0.69	1.07	0.95	1.74	0.44	0.81
	SB	929	579	1,528	829	900	900	900	900	1950	1950	1.03	0.64	1.70	0.92	0.78	0.43
		1,782															
	EB	12	1	14	1	450	450	450	450	450	450	0.03	0.00	0.03	0.00	0.03	0.00
	WB	122	147	154	153	450	450	450	450	450	450	0.27	0.33	0.34	0.34	0.34	0.34
	NB	448	862	668	1,489	900	900	900	900	1950	1950	0.50	0.96	0.74	1.65	0.34	0.76
	SB	972	544	1,578	770	900	900	900	900	1950	1950	1.08	0.60	1.75	0.86	0.81	0.39
59 Old Hwy 99 79th Ave SE TMC Date: 10/28/14 Peak Hour: 4:30 - 5:30 PHF: .95		1,554															
	EB	0	0	0	0	0	0	0	0	0	0						
	WB	60	19	70	17	450	450	450	450	450	450	0.13	0.04	0.16	0.04	0.16	0.04
	NB	45	105	78	263	450	450	450	450	450	450	0.10	0.23	0.17	0.58	0.17	0.58
	SB	65	46	213	81	450	450	450	450	450	450	0.13	0.04	0.16	0.04	0.16	0.04
		170															
	EB	0	0	0	0	0	0	0	0	0	0						
60 Kimmie St SW 83rd Ave SW TMC Date: 03/03/15 Peak Hour: 4:30 - 5:30 PHF: .82	WB	60	19	70	17	450	450	450	450	450	450	0.13	0.04	0.16	0.04	0.16	0.04
	NB	45	105	78	263	450	450	450	450	450	450	0.10	0.23	0.17	0.58	0.17	0.58
	SB	65	46	213	81	450	450	450	450	450	450	0.13	0.04	0.16	0.04	0.16	0.04
		170															
	EB	0	0	0	0	0	0	0	0	0	0						
	WB	60	19	70	17	450	450	450	450	450	450	0.13	0.04	0.16	0.04	0.16	0.04
	NB	45	105	78	263	450	450	450	450	450	450	0.10	0.23	0.17	0.58	0.17	0.58



PM Peak Hour Volumes



PM Peak Hour Volumes

[illegible]

APPENDIX A-5

CAPACITY ANALYSIS WORKSHEETS

HCM 2010 AWSC
1: RW Johnson Rd & Mottman Rd

Existing 2015
PM Peak Hour

Intersection													
Intersection Delay, s/veh												11.7	
Intersection LOS												B	
Movement	EBU	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR		
Traffic Vol, veh/h	0	45	80	5	0	105	45	65	0	5	155		
Future Vol, veh/h	0	45	80	5	0	105	45	65	0	5	155		
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		
Heavy Vehicles, %	2	6	6	6	2	9	9	9	2	4	4		
Mvmt Flow	0	49	87	5	0	114	49	71	0	5	168		
Number of Lanes	0	1	1	0	0	1	1	0	0	1	1		
Approach													
Opposing Approach	EB			WB			NB						
Opposing Lanes	WB			EB			SB						
Conflicting Approach Left	2			2			2						
Conflicting Lanes Left	SB			NB			EB						
Conflicting Approach Right	2			2			2						
Conflicting Lanes Right	NB			SB			WB						
HCM Control Delay	2			2			2						
HCM LOS	10.4			10.8			13.7						
	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%	53%	0%	94%	0%	41%	0%	83%					
Vol Right, %	0%	47%	0%	6%	0%	59%	0%	17%					
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop					
Traffic Vol by Lane	5	290	45	85	105	110	45	115					
LT Vol	5	0	45	0	105	0	45	0					
Through Vol	0	155	0	80	0	45	0	95					
RT Vol	0	135	0	5	0	65	0	20					
Lane Flow Rate	5	315	49	92	114	120	49	125					
Geometry Grp	7	7	7	7	7	7	7	7					
Degree of Util (X)	0.01	0.495	0.094	0.164	0.217	0.196	0.091	0.21					
Departure Headway (Hd)	6.488	5.652	6.937	6.387	6.832	5.906	6.67	6.04					
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes					
Cap	552	637	516	561	525	606	537	594					
Service Time	4.227	3.391	4.687	4.138	4.578	3.651	4.415	3.785					
HCM Lane V/C Ratio	0.009	0.495	0.095	0.164	0.217	0.198	0.091	0.21					
HCM Control Delay	9.3	13.8	10.4	10.4	11.5	10.1	10.1	10.4					
HCM Lane LOS	A	B	B	B	B	B	B	B					
HCM 95th-ile Q	0	2.8	0.3	0.6	0.8	0.7	0.3	0.8					

HCM 2010 AWSC
1: RW Johnson Rd & Mottman Rd

Existing 2015
PM Peak Hour

Intersection					
Intersection Delay, s/veh					
Intersection LOS					
Movement	SBU	SBL	SBT	SBR	
Traffic Vol, veh/h	0	45	95	20	
Future Vol, veh/h	0	45	95	20	
Peak Hour Factor	0.92	0.92	0.92	0.92	
Heavy Vehicles, %	2	3	3	3	
Mvmt Flow	0	49	103	22	
Number of Lanes	0	1	1	0	
Approach					
Approach	SB				
Opposing Approach	NB				
Opposing Lanes	2				
Conflicting Approach Left	WB				
Conflicting Lanes Left	2				
Conflicting Approach Right	EB				
Conflicting Lanes Right	2				
HCM Control Delay	10.3				
HCM LOS	B				
Lane					

Lanes, Volumes, Timings

2: Crosby Blvd & Mottman Rd

Existing 2015
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	175	250	25	5	30	65	40	350	165	120	630	425
Traffic Volume (vph)	175	250	25	5	30	65	40	330	165	120	630	425
Future Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	200	0	0	0	200	0	200	0	100	0	100	0
Storage Length (ft)	1	0	0	0	1	0	1	1	1	1	1	0
Storage Lanes	25	0	0	0	25	0	25	0	25	0	25	0
Taper Length (ft)	30	1116	645	417	9.5	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Right Turn on Red	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Link Speed (mph)	30	940	21.4	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Travel Time (s)	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Peak Hour Factor	3%	3%	3%	0%	0%	0%	1%	1%	1%	3%	3%	3%
Heavy Vehicles (%)	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Shaded Lane Traffic (%)	4	4	8	8	8	8	2	2	2	6	6	6
Turn Type	4	4	8	8	8	8	2	2	2	6	6	6
Protected Phases	4	4	8	8	8	8	2	2	2	6	6	6
Permitted Phases	4	4	8	8	8	8	2	2	2	6	6	6
Detector Phase	4	4	8	8	8	8	2	2	2	6	6	6
Switch Phase	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Infill (s)	20.5	20.5	39.0	39.0	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5
Minimum Spill (s)	39.0	39.0	61.0	61.0	39.0	39.0	61.0	61.0	61.0	61.0	61.0	61.0
Total Split (%)	39.0%	39.0%	39.0%	39.0%	61.0%	61.0%	61.0%	61.0%	61.0%	61.0%	61.0%	61.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
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	4.5
Lead/Lag	Lead/Lag Optimize?	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Intersection Summary	Area Type:	Other										
	Cycle Length:	100										
	Actuated Cycle Length:	100										
	Offset: 82 (62%), Referenced to phase 2,NBTL and 6,SBTL, Start of Yellow											
	Natural Cycle: 50											
	Control Type: Actuated Coordinated											
Spills and Phases: 2: Crosby Blvd & Mottman Rd												
61s	62(R)	39s	04	08								
61s	06(R)	39s										

HCM 2010 Signalized Intersection Summary

2: Crosby Blvd & Mottman Rd

Existing 2015
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	175	250	25	5	30	65	40	350	165	120	630	425
Traffic Volume (veh/h)	175	250	25	5	30	65	40	350	165	120	630	425
Future Volume (veh/h)	175	250	25	5	30	65	40	350	165	120	630	425
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped Bike Adj(A _b),pbh	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/hln	1845	1845	1900	1900	1900	1881	1881	1845	1845	1845	1900	1900
Adj Flow Rate, veh/h	197	281	28	6	34	73	45	393	185	135	708	0
Adj No. of Lanes	1	1	0	0	1	0	1	1	1	1	2	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh. %	3	3	3	0	0	0	1	1	1	3	3	3
Cap. veh/h	357	358	36	44	123	236	517	1304	1108	561	2430	0
Arrive On Green	0.22	0.22	0.22	0.22	0.22	0.22	0.69	0.69	0.69	0.69	0.69	0.00
Sat Flow, veh/h	1269	1651	165	29	567	1089	745	1881	1599	824	3597	0
Gp Volume(v), veh/hln	197	0	309	113	0	0	45	393	185	135	708	0
Gp Sat Flow(s), veh/hln	1269	0	1816	1686	0	0	745	1881	1599	824	1752	0
Q Serve(s), s	9.0	0.0	16.1	0.0	0.0	0.0	2.6	8.1	4.0	8.0	7.8	0.0
Cycle Q Clear(g.c), s	13.5	0.0	16.1	5.6	0.0	0.0	12.2	8.1	4.0	17.9	7.8	0.0
Prop. In Lane	1.00	0.09	0.05	0.65	1.00							0.00
Lane Gp Cap(c), veh/h	357	0	394	403	0	0	517	1304	1108	561	2430	0.00
V/C Ratio(X)	0.35	0.00	0.28	0.00	0.00	0.00	0.09	0.30	0.17	0.24	0.29	0.00
Avail Cap(C-a), veh/h	519	0	626	615	0	0	517	1304	1108	561	2430	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(f)	1.00	0.00	1.00	1.00	0.00	0.00	0.96	0.96	0.96	1.00	1.00	0.00
Uniform Delay (d), s/veh	35.7	0.0	37.0	32.8	0.0	0.0	8.6	5.9	5.3	9.9	5.9	0.0
Incr Delay (d2), s/veh	1.3	0.0	3.5	0.4	0.0	0.0	0.3	0.6	0.3	1.0	0.3	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackQ(50%),veh/hln	5.1	0.0	8.4	2.6	0.0	0.0	0.6	4.4	1.8	2.0	3.8	0.0
LnGrp Delay(d),s/veh	37.1	0.0	40.4	33.2	0.0	0.0	8.9	6.5	5.6	10.9	6.2	0.0
LnGrp LOS	D	D	D	C	A	A	A	A	A	B	A	A
Approach Vol, veh/h	506			113			623			843		
Approach Delay, s/veh	39.1			33.2			6.4			7.0		
Approach LOS	D			C			A			A		
Timer	1	2	3	4	5	6	7	8				
Assigned Pts	2	2	4	4	5	6	8					
Pts Duration (G+Y+Rc), s	74.1	25.9	74.1	25.9	74.1	25.9	4.5					
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5					
Max Green Setting (Gmax), s	56.5	34.5	56.5	34.5	56.5	34.5	7.6					
Max O Clear Time (g.c+1), s	14.2	18.1	14.2	18.1	14.2	18.1	3.4					
Green Ext Time (p.c.), s	12.7	3.0	12.2	3.0	12.2	3.0						
Intersection Summary												
HCM 2010 Crt Delay	16.0											
HCM 2010 LOS	B											

Lanes, Volumes, Timings

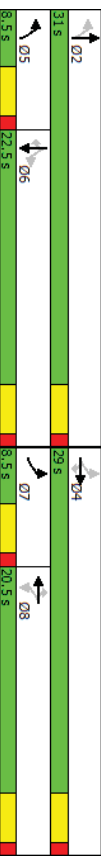
Existing 2015
PM Peak Hour

3: Crosby Blvd & Irving St

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	75	20	15	165	35	25	25	290	15	160	425	95
Future Volume (vph)	75	20	15	165	35	25	25	290	15	160	425	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	200	0	0	150	200	0	0	0	250	250
Storage Lanes	0	1	0	1	0	1	1	0	1	1	1	1
Taper Length (ft)	25			25			25			25		
Right Turn on Red		Yes			Yes			Yes			Yes	
Link Speed (mph)	30			30			30			30		
Link Distance (ft)	468			2725			1710			645		
Travel Time (s)	10.6			61.9			38.9			14.7		
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	8%	8%	8%	1%	1%	1%	1%	1%	1%	2%	2%	2%
Shared Lane Traffic (%)												
Turn Type	pm+pl	NA	Perm	Perm	NA	pm+pl	NA	Perm	NA	Perm	NA	Perm
Protected Phases	7	4		8	8		5	2		6	6	6
Permitted Phases	4			4	8		8	2		6	6	6
Detector Phase	7	4	4	4	8	8	8	5	2	6	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Spill (s)	8.5	20.5	20.5	20.5	20.5	20.5	8.5	20.5	20.5	20.5	20.5	20.5
Total Spill (s)	8.5	29.0	29.0	20.5	20.5	20.5	8.5	31.0	22.5	22.5	22.5	22.5
Total Split (%)	14.2%	48.3%	48.3%	34.2%	34.2%	34.2%	14.2%	51.7%	37.5%	37.5%	37.5%	37.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
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	4.5
Lead/Lag	Lead			Lag			Lag			Lag		
Lead-Lag Optimizer?	Yes			Yes			Yes			Yes		
Recall Mode	None	None	None	None	None	None	None	Max		Max	Max	Max

Area Type:	Other
Cycle Length:	60
Actuated Cycle Length:	51.7
Natural Cycle:	60
Control Type:	Actuated-Uncoordinated

Splits and Phases: 3 Crosby Blvd & Irving St



HCM 2010 Signalized Intersection Summary

Existing 2015
PM Peak Hour

3: Crosby Blvd & Irving St

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	75	20	15	165	35	25	25	290	15	160	425	95
Future Volume (veh/h)	75	20	15	165	35	25	25	290	15	160	425	95
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb) veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped Bike Adj (Adj _b)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/hln	1900	1759	1759	1900	1881	1881	1881	1900	1863	1863	1863	1863
Adj Flow Rate, veh/h	84	22	17	185	39	28	28	326	17	180	478	0
Adj No. of Lanes	0	1	1	0	1	1	1	1	0	1	1	1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh. %	8	8	8	1	1	1	1	1	1	2	2	2
Arrive On Green	0.26	0.26	0.26	0.26	0.26	0.26	0.03	0.55	0.55	0.43	0.43	0.00
Cap. veh/h	137	20	387	370	61	414	416	980	51	598	807	686
Sat Flow, veh/h	11	77	1495	898	236	1599	1792	1772	92	1033	1863	1583
Gp Volume (v) veh/h	106	0	17	224	0	28	28	0	343	180	478	0
Gp Sat Flow (s) veh/hln	88	0	1495	1134	0	1599	1792	0	1865	1033	1863	1583
Q Sat Flow (s) s	3.1	0.0	0.4	6.6	0.0	0.6	0.4	0.0	4.8	5.7	9.4	0.0
Cycle Q Clear (g-c) s	3.1	0.0	0.4	9.7	0.0	0.6	0.4	0.0	4.8	5.7	9.4	0.0
Prop In Lane	0.79	1.00	0.83	1.00	0.83	1.00	1.00	0.05	1.00	1.00	1.00	1.00
Lane Gp Cap (c) veh/h	0	0	387	431	0	414	416	0	1032	598	807	686
Aval Ratio (X)	0.00	0.00	0.04	0.52	0.00	0.07	0.07	0.00	0.33	0.30	0.89	0.00
Avail Cap (c-a) veh/h	0	0	765	539	0	534	519	0	1032	598	807	686
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter (f)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d) s/veh	0.0	0.0	13.3	17.8	0.0	13.4	7.5	0.0	5.9	9.3	10.3	0.0
Incrl Delay (d2) s/veh	0.0	0.0	0.0	1.0	0.0	0.1	0.1	0.0	0.9	1.3	3.2	0.0
Initial Q Delay (d3) s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back (Q/50%) veh/hln	0.0	0.0	0.2	2.9	0.0	0.3	0.2	0.0	2.7	1.8	5.5	0.0
LnGrp Delay (d) s/veh	0.0	0.0	13.4	18.8	0.0	13.5	7.5	0.0	6.7	10.6	13.5	0.0
LnGrp LOS			B	B		B	A		A	B	B	
Approach Vol, veh/h	123			252				371			658	
Approach Delay, s/veh	1.8			18.2				6.8			12.7	
Approach LOS	A			B				A			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Pts	2	2	3	4	5	6	7	8				
Pts Duration (G+Y+Rc) s	31.0	16.9	5.7	25.3	16.9	16.9	16.9	16.9				
Change Period (Y+Rc) s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax) s	26.5	24.5	4.0	18.0	26.5	26.5	26.5	26.5				
Max Q Clear Time (g-c+1) s	6.8	5.1	2.4	11.4	6.8	6.8	6.8	6.8				
Green Ext Time (p-c) s	6.1	2.0	0.0	3.2	6.1	6.1	6.1	6.1				

HCM 2010 AWSC
4: Irving St & 7th Ave

Existing 2015
PM Peak Hour

Intersection												
Intersection Delay, s/veh		8.5										
Intersection LOS		A										
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	5	10	165	0	1	20	1	0	175	5	1
Future Vol, veh/h	0	5	10	165	0	1	20	1	0	175	5	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	1	1	1	2	0	0	0	2	1	1	1
Wmnt Flow	0	5	11	179	0	1	22	1	0	190	5	1
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	WB	NB
Opposing Approach	WB		EB	SB
Opposing Lanes	1		1	1
Conflicting Approach Left	SB		NB	EB
Conflicting Lanes Left	1		1	1
Conflicting Approach Right	NB		SB	WB
Conflicting Lanes Right	1		1	1
HCM Control Delay	8		7.7	9.1
HCM LOS	A		A	A

Lane	NB Ln1	EB Ln1	WB Ln1	SB Ln1
Vol Left, %	97%	3%	5%	0%
Vol Thru, %	3%	6%	91%	50%
Vol Right, %	1%	92%	5%	50%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	181	180	22	10
LT Vol	175	5	1	0
Through Vol	5	10	20	5
RT Vol	1	165	1	5
Lane Flow Rate	197	196	24	11
Geometry Grp	1	1	1	1
Degree of Util (X)	0.246	0.212	0.03	0.013
Departure Headway (Hd)	4.497	3.901	4.579	4.282
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	787	925	785	837
Service Time	2.59	1.904	2.588	2.3
HCM Lane V/C Ratio	0.25	0.212	0.031	0.013
HCM Control Delay	9.1	8	7.7	7.4
HCM Lane LOS	A	A	A	A
HCM 95th-ile Q	1	0.8	0.1	0

HCM 2010 AWSC
4: Irving St & 7th Ave

Existing 2015
PM Peak Hour

Intersection												
Intersection Delay, s/veh												
Intersection LOS												
Movement	SBU	SBL	SBT	SBR								
Traffic Vol, veh/h	0	0	5	5								
Future Vol, veh/h	0	0	5	5								
Peak Hour Factor	0.92	0.92	0.92	0.92								
Heavy Vehicles, %	2	0	0	0								
Wmnt Flow	0	0	5	5								
Number of Lanes	0	0	1	0								

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	7.4
HCM LOS	A

Lane	
------	--

HCM 2010 TWSC
5: Crosby Blvd & Barnes Rd

Existing 2015
PM Peak Hour

Intersection												
Int Delay, s/veh		6.3										
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	10	1	0	10	5	190	1	80	5	235	110	20
Future Vol, veh/h	10	1	0	10	5	190	1	80	5	235	110	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	0	-	-	-	175	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	10	10	10	2	2	2	4	4	4	2	2	2
Mvmt Flow	11	1	0	11	5	209	1	88	5	258	121	22

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	744	744	132	742	752	91	143	0	0	93	0	0
Stage 1	648	648	-	93	93	-	-	-	-	-	-	-
Stage 2	96	96	-	649	659	-	-	-	-	-	-	-
Critical Hdwy	7.2	6.6	6.3	7.12	6.52	6.22	4.14	-	-	4.12	-	-
Critical Hdwy Sig 1	6.2	5.6	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Sig 2	6.2	5.6	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.59	4.09	3.39	3.518	4.018	3.318	2.236	-	-	2.218	-	-
Pot Cap-1 Maneuver	321	333	896	332	339	967	1427	-	-	1501	-	-
Stage 1	446	454	-	914	818	-	-	-	-	-	-	-
Stage 2	891	800	-	458	461	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	215	215	896	287	280	967	1427	-	-	1501	-	-
Mov Cap-2 Maneuver	215	215	-	287	280	-	-	-	-	-	-	-
Stage 1	446	376	-	913	817	-	-	-	-	-	-	-
Stage 2	693	799	-	378	382	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB			
HCM Control Delay, s	22.4		10.3		0.1		5.1			
HCM LOS	C		B							
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBL	EBT	WBL	WBR	SBL	SBT	SBR
Capacity (veh/h)	1427	-	219	285	967	1501	-	-	-	-
HCM Lane V/C Ratio	0.001	-	0.055	0.058	0.216	0.172	-	-	-	-
HCM Control Delay (s)	7.5	0	22.4	18.4	9.7	7.9	-	-	-	-
HCM Lane LOS	A	A	C	C	A	A	-	-	-	-
HCM 95th %ile Q(veh)	0	-	0.2	0.2	0.8	0.6	-	-	-	-

HCM 2010 TWSC
6: Black Lake Belmore Rd & Black Lake Blvd

Existing 2015
PM Peak Hour

Intersection												
Int Delay, s/veh		11.9										
Movement	EBT	EBR	WBL	WBT	NBL	NBR						
Traffic Vol, veh/h	170	70	130	305	180	105						
Future Vol, veh/h	170	70	130	305	180	105						
Conflicting Peds, #/hr	0	0	0	0	0	0						
Sign Control	Free	Free	Free	Free	Stop	Stop						
RT Channelized	-	None	-	None	-	None						
Storage Length	-	-	250	-	0	-						
Veh in Median Storage, #	0	-	0	0	0	-						
Grade, %	0	-	-	0	0	-						
Peak Hour Factor	94	94	94	94	94	94						
Heavy Vehicles, %	3	3	0	0	1	1						
Mvmt Flow	181	74	138	324	191	112						

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	295	0	819	218
Stage 1	-	-	-	-	218	-
Stage 2	-	-	-	-	601	-
Critical Hdwy	-	-	4.1	-	6.41	6.21
Critical Hdwy Sig 1	-	-	-	-	5.41	-
Critical Hdwy Sig 2	-	-	-	-	5.41	-
Follow-up Hdwy	-	-	2.2	-	3.509	3.309
Pot Cap-1 Maneuver	-	-	1322	-	346	824
Stage 1	-	-	-	-	821	-
Stage 2	-	-	-	-	549	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1322	-	310	824
Mov Cap-2 Maneuver	-	-	-	-	310	-
Stage 1	-	-	-	-	821	-
Stage 2	-	-	-	-	492	-

Approach	EB		WB		NB	
HCM Control Delay, s	0		2.4		36.5	
HCM LOS					E	
Minor Lane/Major Mvmt	NBL	EBT	EBR	WBL	WBT	
Capacity (veh/h)	403	-	-	1322	-	-
HCM Lane V/C Ratio	0.752	-	-	0.105	-	-
HCM Control Delay (s)	36.5	-	-	8	-	-
HCM Lane LOS	E	-	-	A	-	-
HCM 95th %ile Q(veh)	6.1	-	-	0.3	-	-

HCM 2010 TWSC
7: RW Johnson Rd & Sapp Rd

Existing 2015
PM Peak Hour

Intersection													
Int Delay, s/veh													
5.2													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Traffic Vol, veh/h	15	20	1	5	35	70	0	1	5	85	5	30	
Future Vol, veh/h	15	20	1	5	35	70	0	1	5	85	5	30	
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None	
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-	
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-	
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-	
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85	
Heavy Vehicles, %	3	3	3	1	1	1	0	0	0	3	3	3	
Mvmt Flow	18	24	1	6	41	82	0	1	6	100	6	35	

Major/Minor	Major1	Major2	Minor1	Minor2	
Conflicting Flow All	124	0	0	0	174 194 24 157 154 82
Stage 1	-	-	-	-	59 59 - 94 94 -
Stage 2	-	-	-	-	115 135 - 63 60 -
Critical Hdwy	4.13	-	4.11	-	7.1 6.5 6.2 7.13 6.53 6.23
Critical Hdwy Sig 1	-	-	6.1	5.5	- 6.13 5.53 -
Critical Hdwy Sig 2	-	-	6.1	5.5	- 6.13 5.53 -
Follow-up Hdwy	2.227	-	2.209	-	3.5 4 3.3 3.527 4.027 3.327
Poi Cap-1 Maneuver	1457	-	1596	-	793 705 1058 807 736 975
Stage 1	-	-	-	-	968 850 - 910 815 -
Stage 2	-	-	-	-	895 789 - 945 843 -
Platoon blocked, %	-	-	-	-	- - - - -
Mov Cap-1 Maneuver	1457	-	1596	-	750 693 1058 791 724 975
Mov Cap-2 Maneuver	-	-	-	-	750 693 - 791 724 -
Stage 1	-	-	-	-	946 839 - 898 812 -
Stage 2	-	-	-	-	853 786 - 926 832 -

Approach	EB	WB	NB	SB				
HCM Control Delay, s	3.1	0.3	8.7	10.2				
HCM LOS			A	B				
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	973	1457	-	-	1596	-	-	827
HCM Lane V/C Ratio	0.007	0.012	-	-	0.004	-	-	0.171
HCM Control Delay (s)	8.7	7.5	0	-	7.3	0	-	10.2
HCM Lane LOS	A	A	A	-	A	A	-	B
HCM 95th %ile Q(veh)	0	0	-	-	0	-	-	0.6

HCM 2010 TWSC
8: Sapp Rd & Crosby Blvd

Existing 2015
PM Peak Hour

Intersection													
Int Delay, s/veh													
5.6													
Movement	WBL	WBR	NBT	NBR	SBL	SBT							
Traffic Vol, veh/h	60	15	130	70	20	110							
Future Vol, veh/h	60	15	130	70	20	110							
Conflicting Peds, #/hr	0	0	0	0	0	0							
Sign Control	Stop	Stop	Free	Free	Stop	Stop							
RT Channelized	-	None	-	None	-	None							
Storage Length	250	0	-	-	0	-							
Veh in Median Storage, #	0	-	0	-	0	-							
Grade, %	0	-	0	-	0	-							
Peak Hour Factor	91	91	91	91	91	91							
Heavy Vehicles, %	1	1	1	1	1	0							
Mvmt Flow	66	16	143	77	22	121							

Major/Minor	Minor1	Major1	Minor2	
Conflicting Flow All	241	181	0	181 220
Stage 1	181	-	-	0 0
Stage 2	60	-	-	181 220
Critical Hdwy	7.11	6.21	-	7.1 6.5
Critical Hdwy Sig 1	-	-	-	-
Critical Hdwy Sig 2	-	-	-	-
Follow-up Hdwy	3.509	3.309	-	3.5 4
Poi Cap-1 Maneuver	715	864	-	785 682
Stage 1	823	-	-	-
Stage 2	-	-	-	825 725
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	618	864	-	770 682
Mov Cap-2 Maneuver	618	-	-	770 682
Stage 1	823	-	-	-
Stage 2	-	-	-	809 725

Approach	WB	NB	SB
HCM Control Delay, s	11	0	11.2
HCM LOS	B		B
Minor Lane/Major Mvmt	NBT	NBR/WB, nTWB/Ln2	SBLn1, SBLn2
Capacity (veh/h)	-	618 864 770 682	
HCM Lane V/C Ratio	-	0.107 0.019 0.029 0.177	
HCM Control Delay (s)	-	11.5 9.2 9.8 11.4	
HCM Lane LOS	-	B A A B	
HCM 95th %tile Q(veh)	-	0.4 0.1 0.1 0.6	

SimTraffic Performance Report

Existing 2015
PM Peak Hour

9: Black Lake Belmore Rd & 49th Ave Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Total Del/Veh (s)	5.9	6.9	3.4	7.0	8.7	4.6	6.2	8.3	4.7	0.8	1.1	0.8

9: Black Lake Belmore Rd & 49th Ave Performance by movement

Movement	All
Denied Del/Veh (s)	0.2
Total Del/Veh (s)	4.4

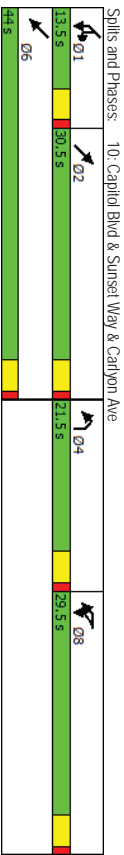
Lanes, Volumes, Timings

Existing 2015
PM Peak Hour

10: Capitol Blvd & Sunset Way & Carlyon Ave

Lane Group	WBL2	WBL	WBR	NBL	NBR	NBR2	NET	NER	NER2	SWL2	SWL	SWT
Lane Configurations												
Traffic Volume (vph)	1	55	40	35	15	2	440	90	15	45	10	815
Future Volume (vph)	1	55	40	35	15	2	440	90	15	45	10	815
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0	0	0	0	0	0	0	0	0	150
Storage Lanes	1	0	1	0	1	0	0	0	0	1	0	1
Taper Length (ft)	25			25								25
Right Turn on Red		Yes			Yes			Yes				
Link Speed (mph)	30			30			30					30
Link Distance (ft)	840			629			731					791
Travel Time (s)	19.1			14.3			16.6					18.0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	2%	2%	2%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	Prot	Prot	Prot	Prot	Prot	Prot	NA	Prot	Prot	Prot	Prot	NA
Protected Phases	8	8		4			2			1		1
Permitted Phases												
Detector Phase	8	8		4			2			1		1
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0			10.0			6.0		10.0
Minimum Spill (s)	29.5	29.5		21.5			29.5			10.5		20.0
Total Split (s)	29.5	29.5		21.5			30.5			13.5		44.0
Total Split (%)	31.1%	31.1%		22.6%			32.1%			14.2%		46.3%
Yellow Time (s)	3.5	3.5		3.5			3.5			3.5		3.5
All-Red Time (s)	1.0	1.0		1.0			1.0			1.0		1.0
Lost Time Adjust (s)	0.0	0.0		0.0			0.0			0.0		0.0
Total Lost Time (s)	4.5			4.5						4.5		4.5
LeadLag							Lag			Lead		
Lead-Lag Optimize?							Yes			Yes		
Recall Mode	None	None		None			Max			None		Max

Area Type:	Other
Cycle Length: 95	
Actuated Cycle Length: 62.3	
Natural Cycle: 95	
Control Type: Actuated-Uncoordinated	



HCM Signalized Intersection Capacity Analysis 10: Capitol Blvd & Sunset Way & Carlyon Ave

Existing 2015
PM Peak Hour

Movement	WBL2	WBL	WBR	NBL	NBR	NBR2	NET	NER	NER2	SWL2	SWL	SWT
Lane Configurations												
Traffic Volume (vph)	1	55	40	35	15	2	440	90	15	45	10	815
Future Volume (vph)	1	55	40	35	15	2	440	90	15	45	10	815
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		1.00		1.00			0.95				1.00	0.95
Fit		0.94		0.96			0.97				1.00	1.00
Fit Protected		0.97		0.97			1.00				0.95	1.00
Satd. Flow (vpo)		1742		1757			3437				1787	3574
Fit Permitted		0.97		0.97			1.00				0.95	1.00
Satd. Flow (perm)		1742		1757			3437				1787	3574
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	1	65	47	41	18	2	518	106	18	53	12	959
RTOR Reduction (vph)	0	104	0	58	0	0	1	0	0	0	0	0
Lane Group Flow (vph)	0	9	0	3	0	0	641	0	0	0	65	959
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	2%	2%	2%	1%	1%	1%
Turn Type	Prot	Prot	Prot	Prot	NA	2	NA	Prot	Prot	Prot	Prot	NA
Protected Phases	8	8		4			2			1		6
Permitted Phases												
Actuated Green, G (s)		5.3		3.4			35.6			4.8	44.9	
Effective Green, g (s)		5.3		3.4			35.6			4.8	44.9	
Actuated g/C Ratio		0.08		0.05			0.53			0.07	0.67	
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 Cap Cap (vph)		137		89			1823			127	2391	
v/s Ratio Prot		c0.01		c0.00			0.19			0.04	c0.27	
v/s Ratio Perm												
V/C Ratio		0.07		0.03			0.35			0.51	0.40	
Uniform Delay, d1		28.6		30.3			9.1			30.0	5.0	
Progression Factor		1.00		1.00			1.00			1.00	1.00	
Incremental Delay, d2		0.2		0.2			0.5			3.5	0.5	
Delay (s)		28.8		30.4			9.6			33.5	5.5	
Level of Service		C		C			A			C	A	
Approach Delay (s)		28.8		30.4			9.6			7.3		
Approach LOS		C		C			A			A		
Intersection Summary												
HCM 2000 Control Delay		10.2		HCM 2000 Level of Service			B					
HCM 2000 Volume to Capacity ratio		0.38										
Actuated Cycle Length (s)		67.1		Sum of lost time (s)			18.0					
Intersection Capacity Utilization		46.1%		ICU Level of Service			A					
Analysis Period (min)		15										
c Critical Lane Group												

HCM 2010 TWSC 11: Deschutes Way & I-5 NB On-Ramp

Existing 2015
PM Peak Hour

Intersection	1.7											
Int Delay s/veh												
Movement		SEL	SET	NWT	NWR	SWL	SWR					
Traffic Vol, veh/h		160	305	225	145	0	0					
Future Vol, veh/h		160	305	225	145	0	0					
Conflicting Peds. #/hr		0	0	0	0	0	0					
Sign Control		Free	Free	Free	Free	Stop	Stop					
RT Channelized		-	None	-	None	-	None					
Storage Length		-	-	-	-	0	-					
Veh in Median Storage, #		-	0	0	0	-	-					
Grade, %		-	0	-	0	-	-					
Peak Hour Factor		79	79	79	79	79	79					
Heavy Vehicles, %		0	0	1	1	0	0					
Mvmt Flow		203	386	285	184	0	0					

Major/Minor	Major1	Major2	Minor2	
Conflicting Flow All	468	0	1168	377
Stage 1	-	-	-	377
Stage 2	-	-	-	791
Critical Hdwy	4.1	-	-	6.4
Critical Hdwy Sig 1	-	-	-	5.4
Critical Hdwy Sig 2	-	-	-	5.4
Follow-up Hdwy	2.2	-	-	3.5
Pot Cap-1 Maneuver	1104	-	-	216
Stage 1	-	-	-	698
Stage 2	-	-	-	450
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	1104	-	-	165
Mov Cap-2 Maneuver	-	-	-	165
Stage 1	-	-	-	698
Stage 2	-	-	-	345

Approach	SE	NW	SW	
HCM Control Delay, s	3.1	0	0	A
HCM LOS				A
Minor Lane/Minor Mvmt	NWT	NWR	SET	SWLT
Capacity (veh/h)	-	1104	-	-
HCM Lane V/C Ratio	-	0.183	-	-
HCM Control Delay (s)	-	9	0	0
HCM Lane LOS	-	A	A	A
HCM 95th %ile Delay	-	0.7	-	-

HCM 2010 TWSC
12: Deschutes Way & US 101 WB On-Ramp

Existing 2015
PM Peak Hour

Intersection						
Int Delay, s/veh		3.7				
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	0	0	430	385	260	20
Future Vol, veh/h	0	0	430	385	260	20
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	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	1	1	0	0
Mvmt Flow	0	0	467	418	283	22

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	1646	-	304	0	- 0
Stage 1	293	-	-	-	-
Stage 2	1353	-	-	-	-
Critical Hdwy	6.4	-	4.11	-	-
Critical Hdwy Sig 1	5.4	-	-	-	-
Critical Hdwy Sig 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	-	2.209	-	-
Poi Cap-1 Maneuver	111	0	1263	-	-
Stage 1	762	0	-	-	-
Stage 2	243	0	-	-	-
Platoon blocked, %					
Mov Cap-1 Maneuver	70	-	1263	-	-
Mov Cap-2 Maneuver	70	-	-	-	-
Stage 1	762	-	-	-	-
Stage 2	153	-	-	-	-

Approach	EB	NB		SB
HCM Control Delay, s	0	5		0
HCM LOS	A			
Minor Lane	Major Mvmt	NBL	NBT EBLn1	SBT SBR
Capacity (veh/h)	1263	-	-	-
HCM Lane V/C Ratio	0.37	-	-	-
HCM Control Delay (s)	9.5	-	0	-
HCM Lane LOS	A	-	A	-
HCM 95th %ile Q(veh)	1.7	-	-	-

SimTraffic Performance Report







Existing 2015
PM Peak Hour

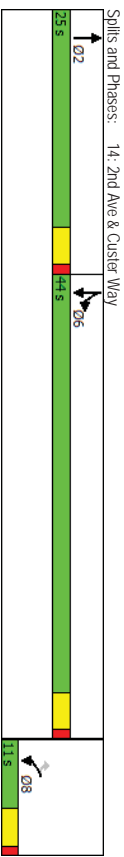
13: 2nd Ave/US 101/I-5 Off-Ramps Performance by movement

Movement	EBR	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	0.2	0.0	0.0	0.5	0.5	0.4
Total Del/Veh (s)	0.7	1.0	0.9	32.0	12.2	22.6

Lanes, Volumes, Timings 14: 2nd Ave & Custer Way







Existing 2015
PM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	125	150	25	150	815	230
Future Volume (vph)	125	150	25	150	815	230
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	225	0	0	0	0
Storage Lanes	1	1	1	1	1	1
Taper Length (ft)	25				25	
Right Turn on Red		Yes		Yes		
Link Speed (mph)	30		30		30	
Link Distance (ft)	662		2035		505	
Travel Time (s)	15.0		46.3		11.5	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	1%	1%	1%	1%	0%	0%
Shared Lane Traffic (%)						
Turn Type	Prot	Perm	NA	Split	NA	NA
Protected Phases	8		2		6	6
Detector Phase	8	8	2		6	6
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0		4.0	4.0
Minimum Spill (s)	100	10.0	24.5		20.0	20.0
Total Spill (s)	11.0	11.0	25.0		44.0	44.0
Total Spill (%)	13.8%	13.8%	31.3%		55.0%	55.0%
Yellow Time (s)	3.5	3.5	3.5		3.5	3.5
All-Red Time (s)	1.0	1.0	1.0		1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5		4.5	4.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	None		Max	Max
Intersection Summary						
Area Type:	Other					
Cycle Length: 80						
Actuated Cycle Length: 66.3						
Natural Cycle: 90						
Control Type: Actuated-Uncoordinated						



HCM 2010 Signalized Intersection Summary 14: 2nd Ave & Custer Way

Existing 2015
PM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT		
Lane Configurations								
Traffic Volume (veh/h)	125	150	25	150	815	230		
Future Volume (veh/h)	125	150	25	150	815	230		
Number	3	18	2	12	1	6		
Initial Q (Ob), veh	0	0	0	0	0	0		
Ped-Bike Adj(A _{pbT})	1.00	1.00	1.00	1.00	1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/hln	1881	1881	1881	1900	1900	1900		
Adj Flow Rate, veh/h	142	5	28	5	926	261		
Adj No. of Lanes	1	1	1	0	1	1		
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88		
Percent Heavy Veh. %	1	1	1	1	0	0		
Cap. veh/h	181	162	44	8	1174	1233		
Arrive On Green	0.10	0.10	0.03	0.03	0.65	0.65		
Sat Flow, veh/h	1792	1599	1555	278	1810	1900		
Gp Volume(v), veh/h	142	5	0	33	926	261		
Gp Sat Flow(s), veh/hln	1792	1599	0	1832	1810	1900		
Q Serve(g.s), s	4.7	0.2	0.0	1.1	22.4	3.4		
Cycle Q Clear(g.c), s	4.7	0.2	0.0	1.1	22.4	3.4		
Prop In Lane	1.00	1.00		0.15	1.00			
Lane Gp Cap(c), veh/h	181	162	0	51	1174	1233		
V/C Ratio(X)	0.78	0.03	0.00	0.64	0.79	0.21		
Avail Cap(C _a), veh/h	191	171	0	617	1174	1233		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(f)	1.00	1.00	0.00	1.00	1.00	1.00		
Uniform Delay (d), s/veh	26.7	24.7	0.0	29.3	7.7	4.3		
Incr Delay (d2), s/veh	16.3	0.0	0.0	4.9	5.4	0.4		
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackQ(50%),veh/hln	3.1	0.1	0.0	0.6	12.6	1.9		
LnGrp Delay(d),s/veh	43.0	24.7	0.0	34.1	13.1	4.7		
LnGrp LOS	D	C		C	B	A		
Approach Vol, veh/h	147		33		1187			
Approach Delay, s/veh	42.4		34.1		11.2			
Approach LOS	D		C		B			
Timer	1	2	3	4	5	6	7	8
Assigned Pts		2				6		8
Pts Duration (G+Y+Rc), s		6.2				44.0		10.7
Change Period (Y+Rc), s		4.5				4.5		4.5
Max Green Setting (Gmax), s		20.5				39.5		6.5
Max Q Clear Time (q _c +1), s		3.1				24.4		6.7
Green Ext Time (p _c), s		0.1				5.0		0.0
Intersection Summary								
HCM 2010 Crt Delay 15.1								
HCM 2010 LOS B								

HCM 2010 TWSC
15: Boston St & Custer Way

Existing 2015
PM Peak Hour

Intersection													
Int Delay, s/veh		4.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	GBR	
Traffic Vol, veh/h	0	710	165	370	260	5	0	1	150	0	1	5	
Future Vol, veh/h	0	710	165	370	260	5	0	1	150	0	1	5	
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	-	-	-	425	-	-	-	-	-	-	-	-	
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	-	-	
Grade, %	-	-	-	-	-	-	-	-	-	-	-	-	
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95	
Heavy Vehicles, %	1	1	1	1	1	1	0	0	0	0	0	0	
Mvmt Flow	0	747	174	389	274	5	0	1	158	0	1	5	
Major/Minor	Major1			Major2			Minor1			Minor2			
Conflicting Flow All	279	0	0	921	0	0	1892	461	1429	1976	276		
Stage 1	-	-	-	-	-	-	-	834	-	1055	1055	-	
Stage 2	-	-	-	-	-	-	-	1058	-	374	921	-	
Critical Hdwy	4.115	-	-	4.115	-	-	-	6.5	6.9	7.3	6.5	6.2	
Critical Hdwy Sig 1	-	-	-	-	-	-	-	5.5	-	6.1	5.5	-	
Critical Hdwy Sig 2	-	-	-	-	-	-	-	5.5	-	6.5	5.5	-	
Follow-up Hdwy	2.2095	-	-	2.2095	-	-	-	4	3.3	3.5	4	3.3	
Pot Cap-1 Maneuver	1289	-	-	744	-	-	0	71	553	105	63	768	
Stage 1	-	-	-	-	-	-	0	386	-	275	305	-	
Stage 2	-	-	-	-	-	-	0	304	-	624	352	-	
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-	
Mov Cap-1 Maneuver	1289	-	-	744	-	-	-	34	553	43	30	768	
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	34	-	43	30	-	
Stage 1	-	-	-	-	-	-	-	386	-	275	146	-	
Stage 2	-	-	-	-	-	-	-	145	-	445	352	-	
Approach	EB			WB			NB			SB			
HCM Control Delay, s	0			8.8			15.5			29.9			
HCM LOS							C			D			
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1					
Capacity (veh/h)	502	1289	-	-	744	-	-	151					
HCM Lane V/C Ratio	0.317	-	-	-	0.523	-	-	0.042					
HCM Control Delay (s)	15.5	0	-	-	15	-	-	29.9					
HCM Lane LOS	C	A	-	-	C	-	-	D					
HCM 95th %ile Q(veh)	1.3	0	-	-	3.1	-	-	0.1					

HCM 2010 AWSC
16: Deschutes Way & Boston St

Existing 2015
PM Peak Hour

Intersection													
Intersection Delay, s/veh		29											
Intersection LOS		D											
Movement	WBL	WBL	WBR	NBL	NBT	NBR	SBL	SBT					
Traffic Vol, veh/h	0	95	415	0	365	60	0	100	185				
Future Vol, veh/h	0	95	415	0	365	60	0	100	185				
Peak Hour Factor	0.92	0.93	0.92	0.93	0.93	0.92	0.93	0.93	0.93				
Heavy Vehicles, %	2	1	1	2	0	0	2	0	0				
Mvmt Flow	0	102	446	0	392	65	0	108	199				
Number of Lanes	0	1	0	0	1	0	0	0	1				
Approach	WB			NB			SB						
Opposing Approach				NB			SB						
Opposing Lanes	0			SB			NB			1			
Conflicting Approach Left	NB						WB			1			
Conflicting Lanes Left				1			0			1			
Conflicting Approach Right	SB						WB			0			
Conflicting Lanes Right	1						1			0			
HCM Control Delay	36			28			17.8			C			
HCM LOS	E			D			C						
Lane	NBLn1	WBLn1	SBLn1										
Vol Left, %	0%	19%	35%										
Vol Thru, %	86%	0%	65%										
Vol Right, %	14%	81%	0%										
Sign Control	Stop	Stop	Stop										
Traffic Vol by Lane	425	510	285										
LT Vol	0	95	100										
Through Vol	365	0	185										
RT Vol	60	415	0										
Lane Flow Rate	457	548	306										
Geometry Grp	1	1	1										
Degree of Util (X)	0.783	0.875	0.561										
Departure Headway (Hd)	6.167	5.742	6.587										
Convergence, Y/N	Yes	Yes	Yes										
Cap	585	631	545										
Service Time	4.216	3.782	4.642										
HCM Lane V/C Ratio	0.781	0.868	0.561										
HCM Control Delay	28	36	17.8										
HCM Lane LOS	D	E	C										
HCM 95th %ile Q	7.4	10.2	3.4										

HCM 2010 TWSC 17: Capitol Blvd & Cleveland Ave

Existing 2015
PM Peak Hour

Intersection									
Int Delay, s/veh		4.1							
Movement	NBL	NBR	NET	NER	SWL	SWT			
Traffic Vol, veh/h	0	225	330	20	365	550			
Future Vol, veh/h	0	225	330	20	365	550			
Conflicting Peds, #/hr	0	0	0	0	0	0			
Sign Control	Stop	Stop	Free	Free	Free	Free			
RT Channelized	-	None	-	Yield	-	None			
Storage Length	-	0	-	-	150	-			
Veh in Median Storage, #	0	-	0	-	-	0			
Grade, %	0	-	0	-	-	0			
Peak Hour Factor	88	88	88	88	88	88			
Heavy Vehicles, %	4	4	1	1	1	1			
Wmtl Flow	0	256	375	23	415	625			
Major/Minor	Minor1	Major1		Major2					
Conflicting Flow All	-	188	0	0	375	0			
Stage 1	-	-	-	-	-	-			
Stage 2	-	-	-	-	-	-			
Critical Hdwy	-	6.98	-	-	4.12	-			
Critical Hdwy Sig 1	-	-	-	-	-	-			
Critical Hdwy Sig 2	-	-	-	-	-	-			
Follow-up Hdwy	-	3.34	-	-	2.21	-			
Poi Cap-1 Maneuver	0	816	-	-	1187	-			
Stage 1	0	-	-	-	-	-			
Stage 2	0	-	-	-	-	-			
Platoon blocked, %	-	-	-	-	-	-			
Mov Cap-1 Maneuver	-	816	-	-	1187	-			
Mov Cap-2 Maneuver	-	-	-	-	-	-			
Stage 1	-	-	-	-	-	-			
Stage 2	-	-	-	-	-	-			
Approach	NB	NE		SW					
HCM Control Delay, s	11.4	0		3.9					
HCM LOS	B								
Minor Lane/Major Wmtl	NET	NER/NBL1	SWL	SWT					
Capacity (veh/h)	-	816	1187	-					
HCM Lane V/C Ratio	-	0.313	0.349	-					
HCM Control Delay (s)	-	11.4	9.7	-					
HCM Lane LOS	-	B	A	-					
HCM 95th %ile Q(veh)	-	1.3	1.6	-					

Lanes, Volumes, Timings 18: Capitol Blvd & Custer Way

Existing 2015
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↰	↰	↰	↰	↰	↰	↰	↰	↰	↰	↰
Traffic Volume (vph)	135	415	650	80	345	440	5	20	330	425	20	390
Future Volume (vph)	135	650	80	345	440	5	20	330	425	20	390	135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	150	0	0	1	0	100	0	100	0	100	0
Storage Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Taper Length (ft)	25	25	25	25	25	25	25	25	25	25	25	25
Right Turn on Red	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Link Speed (mph)	30	30	684	631	631	631	2019	1179	1179	1179	1179	1179
Link Distance (ft)	15.5	15.5	15.5	14.3	14.3	14.3	45.9	26.8	26.8	26.8	26.8	26.8
Travel Time (s)	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Peak Hour Factor	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Heavy Vehicles (%)	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
Shared Lane Traffic (%)	Split	Split	Split	Split	Split	Split	Split	Split	Split	Split	Split	Split
Turn Type	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Protected Phases	4	4	4	8	8	8	5	2	5	2	5	2
Permitted Phases	4	4	4	8	8	8	5	2	5	2	5	2
Detector Phase	4	4	4	8	8	8	5	2	5	2	5	2
Switch Phase	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Minimum Initial (s)	22.0	22.0	22.0	22.0	22.0	22.0	12.5	22.0	12.5	22.0	12.5	22.0
Minimum Split (s)	25.0	25.0	30.0	30.0	30.0	30.0	12.5	22.5	12.5	22.5	12.5	22.5
Total Split (%)	27.8%	27.8%	33.3%	33.3%	33.3%	33.3%	13.9%	25.0%	13.9%	25.0%	13.9%	25.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
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	4.5
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	None	None	None	None	None

Intersection Summary												
Area Type: Other												
Cycle Length: 90												
Actuated Cycle Length: 82.5												
Natural Cycle: 90												
Control Type: Actuated-Uncoordinated												
Spills and Phases: 18: Capitol Blvd & Custer Way												
01	02	03	04	05	06	07	08	09	10	11	12	13
12.5 s	22.5 s	25 s	30 s	12.5 s	22.5 s	25 s	30 s	12.5 s	22.5 s	25 s	30 s	12.5 s
05	06	07	08	09	10	11	12	13	14	15	16	17
12.5 s	22.5 s	25 s	30 s	12.5 s	22.5 s	25 s	30 s	12.5 s	22.5 s	25 s	30 s	12.5 s

HCM 2010 Signalized Intersection Summary

Existing 2015
PM Peak Hour

18: Capitol Blvd & Custer Way

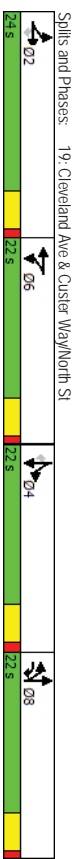
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	135	415	650	80	345	440	5	20	330	425	20	390
Future Volume (veh/h)	135	650	80	345	440	5	20	330	425	20	390	135
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Q ₀), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped/Bike Adj(A _{pb})	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/hln	1881	1881	1900	1881	1881	1900	1881	1881	1900	1900	1900	1900
Adj Flow Rate, veh/h	150	722	0	383	489	6	22	367	189	22	433	150
Adj No of Lanes	1	2	0	1	1	0	1	2	0	1	2	0
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
Percent Heavy Veh. %	1	1	1	1	1	1	1	1	1	1	1	1
Cap. veh/h	410	861	0	525	543	7	69	505	256	70	580	199
Arrive On Green	0.23	0.23	0.00	0.29	0.29	0.04	0.22	0.22	0.04	0.22	0.22	0.22
Sat Flow, veh/h	1792	3762	0	1792	1854	23	1792	2298	1165	1810	2639	906
Grp Volume(V _g), veh/h	150	722	0	383	0	495	22	284	272	22	295	288
Grp Sat Flow(S _g), veh/hln	1792	1881	0	1792	0	1877	1792	1787	1676	1810	1805	1740
Q Serve(g.s), s	5.8	15.0	0.0	15.7	0.0	20.7	1.0	12.1	12.4	1.0	12.5	12.7
Cycle Q Clear(g.c), s	5.8	15.0	0.0	15.7	0.0	20.7	1.0	12.1	12.4	1.0	12.5	12.7
Prop In Lane	1.00	1.00	0.00	1.00	0.01	1.00	0.01	1.00	0.70	1.00	0.52	0.52
Lane Grp Cap(c), veh/h	410	861	0	525	0	550	69	393	368	70	397	383
W/C Ratio(X)	0.37	0.84	0.00	0.73	0.00	0.90	0.32	0.72	0.74	0.32	0.74	0.75
Avail Cap(c, a), veh/h	449	942	0	558	0	585	175	393	368	177	397	383
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(f)	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.6	30.1	0.0	26.0	0.0	27.8	38.3	29.6	29.7	38.3	29.8	29.9
Incr Delay (d ₂), s/veh	0.5	6.3	0.0	4.5	0.0	16.4	2.6	11.0	12.4	2.6	11.9	12.9
Initial Q Delay(d ₀), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackQ(50%), veh/h	2.9	8.5	0.0	8.4	0.0	13.2	0.5	7.1	7.0	0.5	7.5	7.5
LnGrp Delay(d), s/veh	27.1	36.5	0.0	30.6	0.0	44.2	40.9	40.6	42.2	40.9	41.7	42.7
LnGrp LOS	C	D		C		D		D	D	D	D	D
Approach Vol, veh/h	872			878			578			605		
Approach Delay, s/veh	34.9			38.2			41.4			42.1		
Approach LOS	C			D			D			D		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+R ₀), s	7.6	22.5		23.2	7.6	22.5		28.5				
Change Period (Y+R ₀), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (G _{max}), s	8.0	18.0		20.5	8.0	18.0		25.5				
Max Q Clear Time (G ₀ +C+I), s	3.0	14.4		17.0	3.0	14.7		22.7				
Green Ext Time (G ₀ -C), s	0.0	2.2		1.7	0.0	2.1		1.3				
Intersection Summary												
HCM 2010 Ctrl Delay	38.7											
HCM 2010 LOS	D											
Notes												

Lanes, Volumes, Timings

Existing 2015
PM Peak Hour

19: Cleveland Ave & Custer Way/North St

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	330	645	15	245	70	480	135	415	15	105	105
Future Volume (vph)	50	330	645	15	245	70	480	135	415	15	105	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100	0	200	0	300	0	300	0	150	150	150	150
Storage Lanes	1	1	1	1	1	1	1	1	1	1	1	1
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		631			2207			2922			341	
Travel Time (s)		14.3			50.2			66.4			7.8	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	2%	2%	2%
Shared Lane Traffic (%)							50%					
Turn Type	Split	NA	pm+ov	Split	NA		Split	NA		Split	NA	Perm
Protected Phases	2	2	8	6	6	6	8	8	4	4	4	4
Permitted Phases	2	2	8	6	6	6	8	8	4	4	4	4
Detector Phase	2	2	8	6	6	6	8	8	4	4	4	4
Switch Phase												
Minimum Initial (s)	6.0	6.0	8.0	6.0	6.0	6.0	8.0	8.0	6.0	6.0	6.0	6.0
Minimum Spill (s)	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
Total Spill (s)	24.0	24.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (%)	26.7%	26.7%	24.4%	24.4%	24.4%	24.4%	24.4%	24.4%	24.4%	24.4%	24.4%	24.4%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead-Lag Optimizer?												
Recall Mode	None	None	None	None	None	None	None	None	None	None	None	None
Intersection Summary												
Area Type:	Other											
Cycle Length: 90												
Actuated Cycle Length: 88.6												
Natural Cycle: 90												
Control Type: Actuated-Uncoordinated												



HCM 2010 Signalized Intersection Summary 19: Cleveland Ave & Custer Way/North St

Existing 2015
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (veh/h)	50	330	645	15	245	70	480	135	15	106	280	105
Future Volume (veh/h)	50	330	645	15	245	70	480	135	15	106	280	105
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped Bike Adj(A_pb7)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/hln	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881
Adj Flow Rate, veh/h	54	355	586	16	263	75	516	145	16	113	301	22
Adj No of Lanes	1	1	1	1	1	1	0	2	1	0	1	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh. %	1	1	1	1	1	1	1	1	1	2	2	2
Cap veh/h	391	411	625	350	275	79	619	287	32	325	342	290
Arrive On Green	0.22	0.22	0.22	0.20	0.20	0.20	0.17	0.17	0.17	0.18	0.18	0.18
Sat Flow, veh/h	1792	1881	1599	1792	1409	402	3583	1665	184	1774	1863	1583
Sat Volume(V), veh/h	54	355	586	16	0	338	516	0	161	113	301	22
Grip Sat Flow(s), veh/hln	1792	1881	1599	1792	0	1810	1792	0	1849	1774	1863	1583
Q Serve(s), s	2.1	15.8	19.0	0.6	0.0	16.1	12.1	0.0	6.9	4.8	13.7	1.0
Cycle Q Clear(g,c), s	2.1	15.8	19.0	0.6	0.0	16.1	12.1	0.0	6.9	4.8	13.7	1.0
Prop In Lane	1.00	1.00	1.00	0.0	0.22	1.00	1.00	0.10	1.00	1.00	1.00	1.00
Lane Cap Cap(c), veh/h	391	411	625	350	0	354	619	0	319	325	342	290
W/C Ratio(X)	0.14	0.86	0.94	0.05	0.00	0.96	0.83	0.00	0.50	0.35	0.88	0.08
Avail Cap(c), a, veh/h	391	411	625	350	0	354	700	0	361	347	364	310
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(f)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.4	32.7	21.9	28.4	0.0	34.6	34.8	0.0	32.6	31.0	34.6	29.4
Incr Delay (d2), s/veh	0.2	17.1	21.8	0.1	0.0	36.1	7.8	0.0	1.2	0.5	20.1	0.1
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOf(50%), veh/h	1.1	10.1	17.8	0.3	0.0	11.5	6.6	0.0	3.6	2.4	8.9	0.4
Lngrp Delay(d), s/veh	27.5	49.8	43.7	28.5	0.0	70.7	42.6	0.0	33.8	31.4	54.7	29.5
Lngrp LOS	C	D	D	C	E	D	D	C	C	C	D	C
Approach Vol, veh/h	995	45.0	354	67	405	436	47.4					
Approach Delay, s/veh	45.0	688	405	D								
Approach LOS	D	E	D									
Timer	1	2	3	4	5	6	7	8				
Assigned Pks	2	2	4	6	8							
Pks Duration (G+Y+R), s	24.0	21.0	22.0	20.0								
Change Period (Y+R), s	5.0	5.0	5.0	5.0								
Max Green Setting (Gmax), s	19.0	17.0	17.0	17.0								
Max Q Clear Time (G+Ch1), s	21.0	15.7	18.1	14.1								
Green Ext Time (p,c), s	0.0	0.3	0.0	0.9								
Intersection Summary												
HCM 2010 Ctrl Delay	47.6											
HCM 2010 LOS	D											
Notes												

HCM 2010 TWSC 20: Hoady St & North St

Existing 2015
PM Peak Hour

Intersection	1.7											
Int Delay, s/veh	1.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	50	270	2	10	395	50	1	2	5	25	1	15
Future Vol, veh/h	50	270	2	10	395	50	1	2	5	25	1	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	1	1	1	1	1	1	0	0	0	0	0	0
Mvmt Flow	57	310	2	11	454	57	1	2	6	29	1	17

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	511	0	0	941
Stage 1	-	-	-	426
Stage 2	-	-	-	515
Critical Hdwy	4.11	-	-	7.1
Critical Hdwy Stg 1	-	-	-	6.1
Critical Hdwy Stg 2	-	-	-	6.1
Follow-up Hdwy	2.209	-	-	3.5
Pot Cap-1 Maneuver	1059	-	-	245
Stage 1	-	-	-	610
Platoon blocked, %	-	-	-	546
Mov Cap-1 Maneuver	1059	-	-	223
Mov Cap-2 Maneuver	-	-	-	223
Stage 1	-	-	-	570
Stage 2	-	-	-	523
Approach	EB	WB	NB	SB
HCM Control Delay, s	1.3	0.2	14.1	19.5
HCM LOS	B	C		
Minor Lane/Minor Mvmt	NBLn1	EBL	EBT	EBR
Capacity (veh/h)	407	1059	-	1253
HCM Lane V/C Ratio	0.023	0.054	-	0.009
HCM Control Delay (s)	14.1	8.6	-	7.9
HCM Lane LOS	B	A	A	A
HCM 95th %ile Delay	0.1	0.2	-	0

SimTraffic Performance Report

Existing 2015
PM Peak Hour

21: I-5 NB Off-Ramp/Deschutes Way & E St Performance by movement

Movement	WBR	NBT	NBR	SBL	All
Denied Del/Veh (s)	0.3	0.2	0.2	0.2	0.2
Total Del/Veh (s)	1.3	12.2	2.7	0.8	2.4

Lanes, Volumes, Timings 22: E St & Capitol Blvd

Existing 2015
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	90	90	255	115	90	130	215	445	130	190	585	70
Future Volume (vph)	90	90	255	115	90	130	215	445	130	190	585	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0	0	0	175	0	150	0	150	0	0
Storage Lanes	0	0	0	0	0	1	1	1	0	1	1	0
Taper Length (ft)	25	25	25	25	25	25	25	25	25	25	25	25
Right Turn on Red			Yes			Yes		Yes		Yes		Yes
Link Speed (mph)	30	30	30	30	30	30	30	30	30	30	30	30
Link Distance (ft)	282	282	479	479	479	1902	1902	43.2	43.2	43.2	43.2	43.2
Travel Time (s)	6.4	6.4	10.9	10.9	10.9	43.2	43.2	0.86	0.86	0.86	0.86	0.86
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	4	4	8	8	8	5	2	1	6	1	6	6
Detector Phase	4	4	8	8	8	5	2	1	6	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	5.0	8.0	5.0	8.0	5.0	8.0	8.0
Minimum Spill (s)	29.5	29.5	29.5	29.5	29.5	9.5	26.5	9.5	26.5	9.5	26.5	26.5
Total Split (s)	34.0	34.0	34.0	34.0	34.0	18.0	30.0	16.0	28.0	16.0	28.0	28.0
Total Split (%)	42.5%	42.5%	42.5%	42.5%	42.5%	22.5%	37.5%	20.0%	35.0%	20.0%	35.0%	35.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
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	4.5
LeadLag						Lead	Lag	Lead	Lag	Lead	Lag	Lead
LeadLag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Min	None	Min	None	Min	None

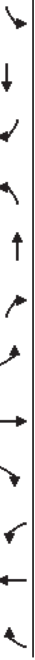
Intersection Summary	Other
Area Type:	Other
Cycle Length: 80	
Actuated Cycle Length: 74.9	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	



HCM 2010 Signalized Intersection Summary

22: E St & Capitol Blvd

Existing 2015
PM Peak Hour

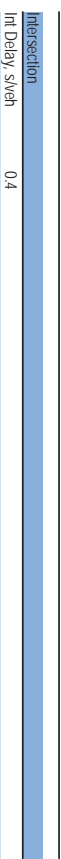


Movement	EBL	EET	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4			4			1		1	4	
Traffic Volume (veh/h)	90	90	255	115	90	130	215	445	130	190	585	70
Future Volume (veh/h)	90	90	255	115	90	130	215	445	130	190	585	70
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (OB) veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped/Bike Adj (pb)	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow (veh/hln)	1900	1881	1900	1900	1900	1881	1881	1900	1881	1881	1900	1881
Adj Flow Rate, veh/h	105	105	0	134	105	151	250	517	151	221	680	81
Adj No. of Lanes	0	1	0	0	1	0	1	2	0	1	2	0
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh. %	1	1	1	0	0	0	1	1	1	1	1	1
Cap. veh/h	258	231	0	223	156	190	302	906	263	269	1008	120
Arrive On Green	0.30	0.30	0.00	0.30	0.30	0.30	0.17	0.33	0.33	0.15	0.31	0.31
Sat Flow, veh/h	567	767	0	483	516	631	1792	2134	795	1792	3218	377
Grp Volume(s), veh/h	210	0	0	390	0	0	250	337	331	221	377	384
Grp Sat Flow(s), veh/hln	1333	0	0	1630	0	0	1792	1787	1741	1792	1787	1814
Q Served(s), s	0.0	0.0	0.0	5.5	0.0	0.0	8.4	9.7	9.8	7.4	11.4	11.5
Cycle Q Clearing(c), s	7.9	0.0	0.0	13.3	0.0	0.0	8.4	9.7	9.8	7.4	11.4	11.5
Prop In Lane	0.50		0.00	0.34		0.39	1.00		0.46	1.00		0.21
Lane Cap(c), veh/h	489	0	0	569	0	0	302	592	577	269	560	568
V/C Ratio(X)	0.43	0.00	0.00	0.69	0.00	0.00	0.83	0.57	0.82	0.67	0.68	0.67
Avail Cap(c), veh/h	732	0	0	837	0	0	389	732	713	331	675	685
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(f)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), veh/h	17.6	0.0	0.0	19.7	0.0	0.0	25.0	17.2	17.2	25.6	18.6	18.6
Inc Delay (d2), veh/h	0.6	0.0	0.0	1.5	0.0	0.0	11.1	0.9	0.9	12.6	2.0	2.0
Initial Q Delay(d3), veh/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/hln	3.1	0.0	0.0	6.3	0.0	0.0	5.1	4.9	4.8	4.6	5.9	6.1
LnGrp Delay(d), veh/h	18.2	0.0	0.0	21.1	0.0	0.0	36.2	18.0	18.1	38.2	20.6	20.6
LnGrp LOS	B			C			D	B	B	D	C	C
Approach Vol, veh/h			210			390			918		982	
Approach Delay, veh/h			18.2			21.1			23.0		24.6	
Approach LOS			B			C			C		C	
Timer	1	2	3	4	5	6	7	8				
Assigned Pns	1	2		4	5	6		8				
Pns Duration (G+Y+Rc), s	13.9	25.1		23.3	15.0	24.0		23.3				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	11.5	25.5		29.5	13.5	23.5		29.5				
Max Q Clear Time (G-C+1), s	9.4	11.8		9.9	10.4	13.5		15.3				
Green Ext Time (p_c), s	0.1	7.5		3.9	0.2	6.0		3.4				
Intersection Summary												
HCM 2010 CH Delay	22.9											
HCM 2010 LOS	C											

HCM 2010 TWSC
23: Cleveland Ave & South St

23: Cleveland Ave & South St

Existing 2015
PM Peak Hour



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	5	15	570	10	15	85
Future Vol, veh/h	5	15	570	10	15	85
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	-	-	-	-	-
Vehin Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	0	0	1	1	1	1
Mmt Flow	6	17	648	11	17	972

HCM 2010 TWSC
24: Linwood Ave & 7th Ave

Existing 2015
PM Peak Hour

Intersection													
Int Delay, s/veh													
3.3													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Traffic Vol, veh/h	20	140	0	1	260	225	0	0	1	120	0	15	
Future Vol, veh/h	20	140	0	1	260	225	0	0	1	120	0	15	
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None	
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-	
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	-	0	
Grade, %	-	0	-	-	0	-	-	0	-	-	-	0	
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93	
Heavy Vehicles, %	3	3	3	1	1	1	0	0	0	1	1	1	
Mvmt Flow	22	151	0	1	280	242	0	0	1	129	0	16	
Major/Minor	Major1			Major2			Minor1			Minor2			
Conflicting Flow All	522	0	0	151	0	0	605	718	151	597	597	401	
Stage 1	-	-	-	-	-	-	194	194	-	403	403	-	
Stage 2	-	-	-	-	-	-	411	524	-	194	194	-	
Critical Hdwy	4.13	-	-	4.11	-	-	7.1	6.5	6.2	7.11	6.51	6.21	
Critical Hdwy Sig 1	-	-	-	-	-	-	6.1	5.5	-	6.11	5.51	-	
Critical Hdwy Sig 2	-	-	-	-	-	-	6.1	5.5	-	6.11	5.51	-	
Follow-up Hdwy	2.227	-	-	2.209	-	-	3.5	4	3.3	3.509	4.009	3.309	
Pln Cap-1 Maneuver	1039	-	-	1436	-	-	413	357	901	416	418	651	
Stage 1	-	-	-	-	-	-	812	744	-	626	601	-	
Stage 2	-	-	-	-	-	-	622	533	-	810	742	-	
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-	
Moar Cap-1 Maneuver	1039	-	-	1436	-	-	395	348	901	408	408	651	
Moar Cap-2 Maneuver	-	-	-	-	-	-	395	348	-	408	408	-	
Stage 1	-	-	-	-	-	-	793	727	-	612	600	-	
Stage 2	-	-	-	-	-	-	606	532	-	790	725	-	
Approach	EB			WB			NB			SB			
HCM Control Delay, s	1.1			0			9			17.8			
HCM LOS							A			C			
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1					
Capacity (veh/h)	901	1039	-	-	1436	-	-	426					
HCM Lane V/C Ratio	0.001	0.021	-	-	0.001	-	-	0.341					
HCM Control Delay (s)	9	8.5	0	-	7.5	0	-	17.8					
HCM Lane LOS	A	A	A	-	A	A	-	C					
HCM 95th %ile Q(veh)	0	0.1	-	-	0	-	-	1.5					

HCM 2010 AWSC
25: Linwood Ave & 2nd Ave

Existing 2015
PM Peak Hour

Intersection													
Intersection Delay, s/veh													
Intersection LOS													
C													
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	
Traffic Vol, veh/h	0	30	165	100	0	100	245	60	0	105	115	95	
Future Vol, veh/h	0	30	165	100	0	100	245	60	0	105	115	95	
Peak Hour Factor	0.92	0.89	0.89	0.92	0.89	0.89	0.89	0.89	0.92	0.89	0.89	0.89	
Heavy Vehicles, %	2	1	1	1	2	1	1	1	2	0	0	0	
Mvmt Flow	0	34	185	112	0	112	215	67	0	118	129	107	
Number of Lanes	0	1	1	0	0	1	1	0	0	1	1	0	
Approach	EB			WB			NB			SB			
Opposing Approach	WB			EB			SB			EB			
Opposing Lanes	2			2			2			2			
Conflicting Approach Left	SB			NB			EB			EB			
Conflicting Lanes Left	2			2			2			2			
Conflicting Approach Right	NB			SB			WB			WB			
Conflicting Lanes Right	2			2			2			2			
HCM Control Delay	25.2			28.5			18.5			C			
HCM LOS	D			D			C			C			
Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2					
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%					
Vol Thru, %	0%	55%	0%	62%	0%	80%	0%	57%					
Vol Right, %	0%	45%	0%	38%	0%	20%	0%	43%					
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop					
Traffic Vol by Lane	105	210	30	265	100	305	65	290					
LT Vol	105	0	30	0	100	0	65	0					
Through Vol	0	115	0	165	0	245	0	165					
RT Vol	0	95	0	100	0	60	0	125					
Lane Flow Rate	118	236	34	298	112	343	73	326					
Geometry Grp	7	7	7	7	7	7	7	7					
Degreed of Util (X)	0.296	0.536	0.084	0.678	0.272	0.768	0.18	0.728					
Departure Headway (Hd)	9.024	8.176	8.986	8.193	8.73	8.07	8.874	8.043					
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes					
Service Time	6.782	5.933	6.742	5.948	6.487	5.826	6.629	5.797					
HCM Lane V/C Ratio	0.296	0.535	0.085	0.676	0.273	0.764	0.18	0.724					
HCM Control Delay	15.6	20	12.6	26.6	14.7	33	13.6	29.6					
HCM Lane LOS	C	C	B	D	B	D	B	D					
HCM 95th-ile Q	1.2	3.1	0.3	4.9	1.1	6.6	0.6	5.8					

HCM 2010 AWSC 25: Linwood Ave & 2nd Ave

Existing 2015
PM Peak Hour

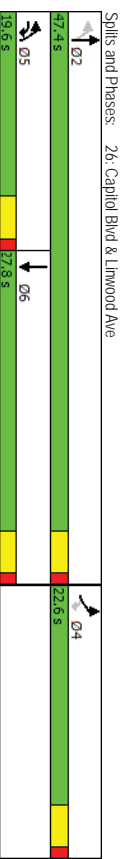
Intersection					
Intersection Delay, s/veh					
Intersection LOS					
Movement	SBU	SBL	SBT	SBR	
Traffic Vol, veh/h	0	65	165	125	
Future Vol, veh/h	0	65	165	125	
Peak Hour Factor	0.92	0.89	0.89	0.89	
Heavy Vehicles, %	2	1	1	1	
Wmtl Flow	0	73	185	140	
Number of Lanes	0	1	1	0	
Approach					
	SB				
Opposing Approach	NB				
Opposing Lanes	2				
Conflicting Approach Left	WB				
Conflicting Lanes Left	2				
Conflicting Approach Right	EB				
Conflicting Lanes Right	2				
HCM Control Delay	26.7				
HCM LOS	D				
Lane					

Lanes, Volumes, Timings 26: Capitol Blvd & Linwood Ave

Existing 2015
PM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	165	145	155	625	705	240
Future Volume (vph)	165	145	155	625	705	240
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150	0	150	1900	1900	0
Storage Lanes	1	1	1	1	1	0
Taper Length (ft)	25		25			
Right Turn on Red		Yes				Yes
Link Speed (mph)	30		30		30	
Link Distance (ft)	489		2664		1902	
Travel Time (s)	11.1		60.5		43.2	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)						
Turn Type	Prot	pm+ov	pm+pl	NA	NA	
Protected Phases	4	5	2	2	6	
Permitted Phases	4	4	2			
Detector Phase	4	5	3	2	6	
Switch Phase						
Minimum Initial (s)	5.0	15.0	15.0	15.0	15.0	
Minimum Spill (s)	22.5	19.5	19.5	20.0	21.5	
Total Spill (s)	22.6	19.6	19.6	47.4	27.8	
Total Split (%)	32.3%	28.0%	28.0%	67.7%	39.7%	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	
Lead/lag		Lead	Lead		Lag	
Lead-lag Optimize?	Yes	Yes	Yes		Yes	
Recall Mode	None	None	None	Max	Max	

Intersection Summary	
Area Type:	Other
Cycle Length:	70
Actuated Cycle Length:	63.3
Natural Cycle:	70
Control Type:	Actuated-Uncoordinated



HCM 2010 Signalized Intersection Summary 26: Capitol Blvd & Linwood Ave

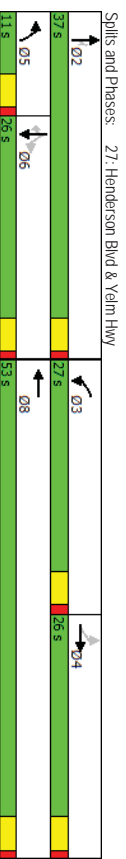
Existing 2015
PM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Volume (veh/h)	165	145	155	625	705	240
Future Volume (veh/h)	165	145	155	625	705	240
Number	7	14	5	2	6	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped Bike Adj(A_pb7)	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/hln	1881	1881	1881	1881	1881	1900
Adj Flow Rate, veh/h	196	173	185	744	839	286
Adj No of Lanes	1	1	1	2	2	0
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh. %	1	1	1	1	1	1
Cap. veh/h	260	610	598	2526	1038	353
Arrive On Green	0.15	0.15	0.24	0.71	0.40	0.40
Sat Flow, veh/h	1792	1599	1792	3668	2713	892
Grip Volume(V), veh/h	196	173	185	744	572	553
Grip Sat Flow(s), veh/hln	1792	1599	1792	1787	1787	1724
Q Serve(g.s), s	6.4	4.6	2.3	4.7	17.3	17.3
Cycle Q Clear(g.c), s	6.4	4.6	2.3	4.7	17.3	17.3
Prop In Lane	1.00	1.00	1.00	0.52	0.52	0.52
Lane Grp Cap(c), veh/h	260	610	598	2526	708	683
W/C Ratio(X)	0.75	0.28	0.31	0.29	0.81	0.81
Avail Cap(c), veh/h	534	854	620	2526	708	683
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(f)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	249	13.0	8.4	3.3	16.3	16.3
Incr Delay (d2), s/veh	1.7	0.1	0.1	0.3	9.6	10.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackQ(50%), veh/h	3.3	4.7	1.4	2.4	10.3	10.0
LnGrp Delay(d), s/veh	26.6	13.1	8.5	3.6	25.9	26.3
LnGrp LOS	C	B	A	A	C	C
Approach Vol, veh/h	369		929	1125		
Approach Delay, s/veh	20.3		4.6	26.1		
Approach LOS	C		A	C		
Timer	1	2	3	4	5	6
Assigned Phs						
Phs Duration (G+Y+R), s	47.4		13.3	18.8	28.6	
Change Period (Y+R), s	4.5		4.5	4.5	4.5	
Max Green Setting (Gmax), s	42.9		18.1	15.1	23.3	
Max Q Clear Time (G_c+H), s	6.7		8.4	4.3	19.3	
Green Ext Time (G_c), s	15.1		0.5	0.2	3.2	
Intersection Summary						
HCM 2010 Crt Delay	16.9					
HCM 2010 LOS	B					

Lanes, Volumes, Timings 27: Henderson Blvd & Yelm Hwy

Existing 2015
PM Peak Hour

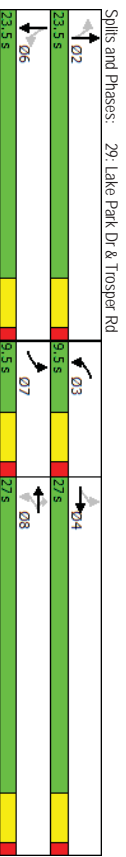
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	5	680	160	430	505	80	110	165	645	155	205	20
Future Volume (vph)	5	680	160	430	505	80	110	165	645	155	205	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	200	0	450	0	200	0	100	0	100	0	150
Storage Lanes	1	1	0	1	1	0	1	1	1	1	1	1
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes		Yes			Yes			Yes	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1947			1645			3441			1606	
Travel Time (s)		44.3			37.4			78.2			36.5	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	Perm	NA		Prot	NA		Prot	NA	Perm	Perm	NA	Perm
Protected Phases		4		3	8		5	2		6		6
Permitted Phases	4		4	3	8		5	2	2	6		6
Detector Phase	4		4	3	8		5	2	2	6		6
Switch Phase												
Minimum Initial (s)	6.0	6.0		5.0	6.0		5.0	6.0	6.0	6.0		6.0
Minimum Spill (s)	24.5	24.5		9.5	24.5		9.5	24.5	24.5	24.5		24.5
Total Split (s)	26.0	26.0		27.0	53.0		11.0	37.0	26.0	26.0		26.0
Total Split (%)	28.9%	28.9%		30.0%	58.9%		12.2%	41.1%	28.9%	28.9%		28.9%
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5		3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0		1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5		4.5
Lead/Lag	Lag	Lag		Lead	Lead		Lead	Lead	Lag	Lag		Lag
Lead-Lag Optimizer?	Yes	Yes		Yes	Yes		Yes	Yes	Lag	Lag		Yes
Recall Mode	Max	Max		None	Max		None	None	None	None		None
Intersection Summary												
Area Type:	Other											
Cycle Length:	90											
Actuated Cycle Length:	85.2											
Natural Cycle:	100											
Control Type:	Actuated-Uncoordinated											



Lanes, Volumes, Timings 29: Lake Park Dr & Trosper Rd

Existing 2015
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	10	250	45	50	370	50	60	25	55	40	20	15
Future Volume (vph)	10	250	45	50	370	50	60	25	55	40	20	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	125	150	225	1	1	1	1	1	1	1	1	0
Storage Length (ft)	1	1	1	1	1	1	1	1	1	1	1	0
Taper Length (ft)	25	25	25	25	25	25	25	25	25	25	25	25
Right Turn on Red	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Link Speed (mph)	30	30	30	30	30	30	30	30	30	30	30	30
Link Distance (ft)	2012	2012	2012	652	652	652	269	269	269	583	583	583
Travel Time (s)	45.7	45.7	45.7	14.8	14.8	14.8	6.1	6.1	6.1	13.3	13.3	13.3
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)	1%	1%	1%	1%	1%	1%	0%	0%	0%	0%	0%	0%
Turn Type	pm+pl	NA	NA	pm+pl	NA	Perm	Perm	NA	NA	Perm	NA	NA
Protected Phases	7	4	3	8	8	8	2	2	2	6	6	6
Permitted Phases	4	4	8	8	8	8	2	2	2	6	6	6
Detector Phase	7	4	3	8	8	8	2	2	2	6	6	6
Switch Phase	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Initial (s)	9.5	26.5	9.5	26.5	26.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5
Minimum Spill (s)	9.5	27.0	9.5	27.0	27.0	23.5	23.5	23.5	23.5	23.5	23.5	23.5
Total Spill (s)	15.8%	45.0%	15.8%	45.0%	45.0%	39.2%	39.2%	39.2%	39.2%	39.2%	39.2%	39.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
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	4.5
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimizer?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	Max	Max	Max	Max	Max
Intersection Summary												
Area Type:	Other											
Cycle Length:	60											
Actuated Cycle Length:	45											
Natural Cycle:	60											
Control Type:	Actuated-Uncoordinated											



HCM 2010 Signalized Intersection Summary 29: Lake Park Dr & Trosper Rd

Existing 2015
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (veh/h)	10	250	45	50	370	50	60	25	55	40	20	15
Future Volume (veh/h)	10	250	45	50	370	50	60	25	55	40	20	15
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Q ₀) veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped Bike Adj (Adj _{pb})	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/hln	1881	1881	1900	1881	1881	1881	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	11	263	47	53	389	53	63	26	58	42	21	16
Adj No of Lanes	1	2	0	1	1	1	1	1	1	1	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh. %	1	1	1	1	1	1	1	1	1	1	1	1
Cap. veh/h	289	791	139	451	563	479	693	210	469	646	402	306
Arrive On Green	0.01	0.26	0.26	0.05	0.30	0.30	0.40	0.40	0.40	0.40	0.40	0.40
Sat Flow, veh/h	1792	3038	536	1792	1881	1599	1393	524	1169	1335	1002	763
Gp Volume(v), veh/h	11	153	157	53	389	53	63	0	84	42	0	37
Gp Sat Flow(s), veh/hln	1792	1787	1787	1792	1881	1599	1393	0	1694	1335	0	1765
Q Sat Flow(s), s	0.2	3.3	3.4	1.0	8.6	1.1	1.4	0.0	1.5	1.0	0.0	0.6
Cycle Q Clear(g.c.), s	0.2	3.3	3.4	1.0	8.6	1.1	2.0	0.0	1.5	2.4	0.0	0.6
Prop In Lane	1.00	0.30	1.00	1.00	1.00	1.00	1.00	0.69	1.00	0.69	1.00	0.43
Lane Gp Cap(c), veh/h	289	466	465	451	563	479	693	0	680	646	0	708
Aval Ratio(X)	0.04	0.33	0.34	0.12	0.69	0.11	0.09	0.00	0.12	0.07	0.00	0.05
Avail Cap(C _a), veh/h	452	849	849	545	894	760	693	0	680	646	0	708
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Filler(f)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	13.0	14.2	14.2	11.6	14.7	12.0	9.3	0.0	8.9	9.7	0.0	8.7
Initial Delay (d ₀), s/veh	0.1	0.4	0.4	0.1	1.5	0.1	0.3	0.0	0.4	0.2	0.0	0.1
Initial Q Delay(d ₀), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackQ(50%), veh/h	0.1	1.7	1.7	0.5	4.7	0.5	0.6	0.0	0.7	0.4	0.0	0.3
LnGrp Delay(d), s/veh	13.1	14.6	14.6	11.7	16.2	12.1	9.5	0.0	9.3	9.9	0.0	8.8
LnGrp LOS	B	B	B	B	B	B	A	A	A	A	A	A
Approach Vol, veh/h	321	495	147									
Approach Delay, s/veh	14.5	15.3	9.4									
Approach LOS	B	B	A									
Timer	1	2	3	4	5	6	7	8				
Assigned Pts	2	3	4	6	7	8						
Pts Duration (G+Y+R ₀), s	23.5	7.0	16.8	23.5	5.2	18.7						
Change Period (Y+R ₀), s	4.5	4.5	4.5	4.5	4.5	4.5						
Max Green Setting (G _{max}), s	19.0	5.0	22.5	19.0	5.0	22.5						
Max Q Clear Time (Q ₀ +c+1), s	4.0	3.0	5.4	4.4	2.2	10.6						
Green Ext Time (P ₀ +c), s	0.8	0.0	4.2	0.8	0.0	3.5						
Intersection Summary												
HCM 2010 Cnt Delay	138											
HCM 2010 LOS	B											

Lanes, Volumes, Timings 30: Littlerock Rd/2nd Ave & Trospier Rd

Existing 2015
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	4	4	4	4	4	4	4	4	4	4	4	4
Traffic Volume (vph)	40	265	110	370	295	30	185	215	395	100	235	45
Future Volume (vph)	40	265	110	370	295	30	185	215	395	100	235	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100	0	150	0	250	0	250	0	150	0	250	0
Storage Lanes	1	0	1	1	0	1	1	0	1	1	0	0
Taper Length (ft)	25	0	25	0	25	0	25	0	25	0	25	0
Right Turn on Red	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Link Speed (mph)	30	652	14.8	520	11.8	520	896	20.4	896	1861	42.3	1861
Travel Time (s)	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Peak Hour Factor	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)	38%	38%	38%	38%	38%	38%	38%	38%	38%	38%	38%	38%
Turn Type	Split	NA	Split	NA	Split	NA	Split	NA	Split	NA	Split	NA
Protected Phases	4	4	4	8	8	8	5	2	8	1	6	6
Permitted Phases	4	4	4	8	8	8	5	2	8	1	6	6
Detector Phase	4	4	4	8	8	8	5	2	8	1	6	6
Switch Phase	4	4	4	8	8	8	5	2	8	1	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Spill (s)	35.6	35.6	35.6	33.6	33.6	24.5	30.6	33.6	8.6	31.6	31.6	31.6
Total Split (s)	36.0	36.0	36.0	37.0	37.0	29.0	42.0	37.0	20.0	33.0	33.0	33.0
Total Split (%)	26.7%	26.7%	26.7%	27.4%	27.4%	21.5%	31.1%	27.4%	14.8%	24.4%	24.4%	24.4%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lost Time (s)	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimizer?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	Max	Max	Max	C-Max	C-Max	C-Max	Max	Max	C-Max	None	Max	Max
Area Type:	Other											
Cycle Length:	135											
Actuated Cycle Length:	135											
Offset:	46 (34%), Referenced to phase 8:WBT, Start of Red											
Natural Cycle:	130											
Control Type:	Actuated-Coordinated											
Spills and Phases:	30: Littlerock Rd/2nd Ave & Trospier Rd											
01	02	03	04	05	06	07	08	09	10	11	12	13
20 s	2 s	2 s	36 s	37 s	33 s	33 s	33 s	33 s	33 s	33 s	33 s	33 s
05	06	07	08	09	10	11	12	13	14	15	16	17

HCM 2010 Signalized Intersection Summary 30: Littlerock Rd/2nd Ave & Trospier Rd

Existing 2015
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	4	4	4	4	4	4	4	4	4	4	4	4
Traffic Volume (veh/h)	40	265	110	370	295	30	185	215	395	100	235	45
Future Volume (veh/h)	40	265	110	370	295	30	185	215	395	100	235	45
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Q ₀) veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped Bike Adj (Adj _{pb})	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/hln	1881	1881	1900	1881	1881	1900	1881	1881	1881	1881	1881	1900
Adj Flow Rate, veh/h	41	270	51	237	499	31	189	219	286	102	240	46
Adj No of Lanes	1	2	1	1	2	0	1	1	1	1	2	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh. %	1	1	1	1	1	1	1	1	1	1	1	1
Arrive On Green	0.23	0.23	0.23	0.40	0.40	0.40	0.40	0.18	0.32	0.32	0.07	0.21
Sat Flow, veh/h	1792	3009	560	1792	3507	217	1792	1881	1599	1792	3002	566
Gp Volume (V _g) veh/h	41	159	162	237	267	263	189	219	286	102	141	145
Gp Sat Flow (S _g) veh/hln	1792	1782	1782	1792	1881	1843	1792	1881	1599	1792	1787	1781
Q Serve (S _g) s	2.4	10.1	10.4	13.7	15.1	15.1	13.0	12.1	12.9	7.6	9.2	9.4
Cycle Q Clear (C _g) s	2.4	10.1	10.4	13.7	15.1	15.1	13.0	12.1	12.9	7.6	9.2	9.4
Prop In Lane	1.00	0.31	1.00	0.12	1.00	0.12	1.00	1.00	1.00	1.00	0.32	0.32
Lane Gp Cap (C _g) veh/h	417	416	415	430	451	442	324	604	897	126	376	375
AVC Ratio (X)	0.10	0.38	0.39	0.55	0.59	0.58	0.36	0.32	0.81	0.38	0.39	0.39
Avail Cap (C _a) veh/h	417	416	415	430	451	442	324	604	897	126	376	375
HCM Platoon Ratio	1.00	1.00	1.00	1.67	1.67	1.67	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Filler (f)	0.97	0.97	0.97	0.87	0.87	0.87	0.91	0.91	0.91	1.00	1.00	1.00
Uniform Delay (d) s/veh	40.7	43.6	43.7	34.9	35.3	35.3	50.6	35.2	15.8	61.9	45.7	45.8
Incrr Delay (d ₂) s/veh	0.5	2.6	2.7	4.4	4.9	5.0	6.9	1.5	0.9	11.7	2.9	3.0
Initial Q Delay (d ₃) s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackQ(50%) s/veh	1.3	5.3	5.4	7.3	8.4	8.3	7.1	6.5	9.0	4.2	4.8	4.9
LnGrp Delay (d ₄) s/veh	41.1	46.2	46.4	39.2	40.1	40.3	57.5	36.8	16.7	73.6	48.6	48.8
LnGrp LOS	D	D	D	D	D	D	E	D	B	E	D	D
Approach Vol, veh/h	362											
Approach Delay, s/veh	45.7											
Approach LOS	D											
Timer	1	2	3	4	5	6	7	8				
Assigned Pts	1	2	4	5	6	8						
Pts Duration (G+Y+R _c) s	14.1	47.9	36.0	29.0	33.0	37.0						
Change Period (Y+R _c) s	4.6	4.6	4.6	4.6	4.6	4.6						
Max Green Setting (G _{max}) s	15.4	37.4	24.4	28.4	32.4	32.4						
Max O Clear Time (G _c +H ₁) s	9.6	14.9	12.4	15.0	11.4	17.1						
Green Ext Time (P _c) s	0.1	3.2	1.5	0.3	3.0	3.5						
Intersection Summary	41.7											
HCM 2010 Cnt Delay	D											
HCM 2010 LOS	D											
Notes												

Lanes, Volumes, Timings

31: Tyee Dr/I-5 SB Ramps & Trosper Rd

Existing 2015
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	155	540	20	245	320	190	25	160	335	460	325	375
Future Volume (vph)	155	540	20	245	320	190	25	160	335	460	325	375
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200	100	275	0	75	0	75	125	400	400	400	400
Storage Lanes	1	1	1	1	1	1	1	1	1	1	1	1
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes		Yes			Yes	
Link Speed (mph)	30			30			30			30		
Link Distance (ft)	520			883			832			952		
Travel Time (s)	11.8			20.1			18.9			21.6		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	2%	2%	2%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	Prot	NA	Perm	Prot	NA	Split	NA	NA	Split	NA	NA	Perm
Protected Phases	7	4		3	8	2	2	2.3	6	6		6
Permitted Phases	7	4	4	3	8	2	2	2.3	6	6		6
Detector Phase	7	4	4	3	8	2	2	2.3	6	6		6
Switch Phase												
Minimum Initial (s)	4.0	10.0	10.0	4.0	10.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Spill (s)	8.6	33.6	33.6	8.6	29.6	20.5	20.5	36.6	36.6	36.6	36.6	36.6
Total Split (s)	25.5	38.0	38.0	32.0	44.5	24.0	24.0	41.0	41.0	41.0	41.0	41.0
Total Split (%)	18.9%	28.1%	28.1%	23.7%	33.0%	17.8%	17.8%	30.4%	30.4%	30.4%	30.4%	30.4%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lag	Lag	Lag
Lead-Lag Optimizer?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	Max	Max	Max	Max	Max	Max	Max

Intersection Summary

Area Type: Other

Cycle Length: 135

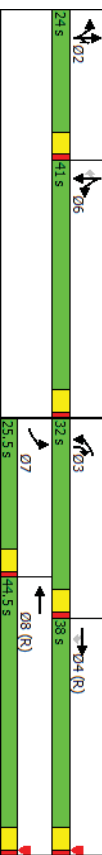
Actuated Cycle Length: 135

Offset: 46 (34%), Referenced to phase 4:EBT and 8:WBT, Start of Red

Natural Cycle: 110

Control Type: Actuated-Coordinated

Splits and Phases: 31: Tyee Dr/I-5 SB Ramps & Trosper Rd



HCM 2010 Signalized Intersection Summary

31: Tyee Dr/I-5 SB Ramps & Trosper Rd

Existing 2015
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (veh/h)	155	540	20	245	320	190	25	160	335	460	325	375
Future Volume (veh/h)	155	540	20	245	320	190	25	160	335	460	325	375
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Q ₀) veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped Bike Adj (Adj _{pb})	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/hln	1881	1881	1881	1881	1881	1881	1863	1863	1863	1881	1881	1881
Adj Flow Rate, veh/h	163	568	21	258	337	0	26	168	300	484	342	79
Adj No of Lanes	1	2	1	1	2	0	1	1	1	2	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh. %	1	1	1	1	1	1	2	2	2	1	1	1
Cap. veh/h	187	1046	468	283	1237	0	255	268	477	628	507	431
Arrive On Green	0.21	0.59	0.59	0.26	0.58	0.00	0.14	0.14	0.14	0.27	0.27	0.27
Sat Flow veh/h	1792	3574	1599	1792	3668	0	1774	1863	1583	2329	1881	1599
Gp Volume(v), veh/h	163	568	21	258	337	0	26	168	300	484	342	79
Gp Sat Flow(s), veh/hln	1792	1787	1599	1792	1787	0	1774	1863	1583	1165	1881	1599
Q Serve(g.s), s	11.9	13.0	0.8	18.9	6.4	0.0	1.7	11.5	19.4	25.9	21.9	5.1
Cycle Q Clear(g.c), s	11.9	13.0	0.8	18.9	6.4	0.0	1.7	11.5	19.4	25.9	21.9	5.1
Prop In Lane	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Gp Cap(c), veh/h	187	1046	468	283	1237	0	255	268	477	628	507	431
V/C Ratio(X)	0.87	0.54	0.04	0.91	0.27	0.00	0.10	0.63	0.63	0.77	0.67	0.18
Avail Cap(C-a), veh/h	277	1046	468	364	1237	0	255	268	477	628	507	431
HCM Platoon Ratio	2.00	2.00	2.00	1.67	1.67	1.67	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(f)	0.89	0.89	0.89	0.85	0.85	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.6	22.5	20.0	48.8	20.0	0.0	50.2	54.4	40.6	45.5	44.0	37.9
Incr Delay (d ₂), s/veh	16.2	1.8	0.2	20.6	0.5	0.0	0.8	10.7	6.2	8.9	7.0	0.9
Initial Q Delay(d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackQ(50%), veh/h	6.7	6.6	0.4	10.9	3.2	0.0	0.9	6.7	10.4	9.1	12.4	2.4
LnGrp Delay(d ₄), s/veh	68.7	24.3	20.1	69.4	20.4	0.0	51.0	65.1	46.8	54.3	51.0	38.8
LnGrp LOS	E	C	C	E	C	D	D	E	D	D	D	D
Approach Vol, veh/h	752			595			494			905		
Approach Delay, s/veh	33.8			41.7			53.2			51.7		
Approach LOS	C			D			D			D		
Timer	1	2	3	4	5	6	7	8				
Assigned Pts	2	2	3	4	5	6	7	8				
Pts Duration (G+Y+Rc), s	24.0	25.9	44.1	41.0	18.7	51.3						
Change Period (Y+Rc), s	4.6	4.6	4.6	4.6	4.6	4.6						
Max Green Setting (Gmax), s	27.4	19.4	33.4	36.4	20.9	39.9						
Max Q Clear Time (Q-clear), s	21.4	20.9	15.0	27.9	13.9	8.4						
Green Ext Time (p.c.), s	0.0	0.5	5.6	3.3	0.2	6.6						

Intersection Summary

HCM 2010 Cnt Delay 44.9

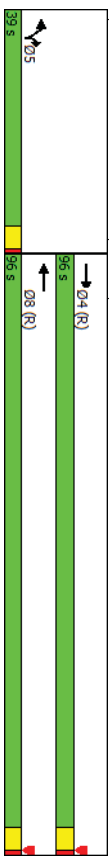
HCM 2010 LOS D

Lanes, Volumes, Timings 32: I-5 NB Ramps & Trosper Rd

Existing 2015
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL2	NBL	NBR	SEL	SER
Lane Configurations		4+1			4+1						
Traffic Volume (vph)	0	815	525	0	590	615	170	0	80	0	0
Future Volume (vph)	0	815	525	0	590	615	170	0	80	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	300	0	0	0	0	0	200	0	0	0
Storage Lanes	1	0	0	0	0	0	1	1	0	0	0
Taper Length (ft)	25			25			25			25	
Right Turn on Red		Yes			Yes			Yes			
Link Speed (mph)	30			30			30			30	
Link Distance (ft)	883			397			785			593	
Travel Time (s)	20.1			9.0			17.8			13.5	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	0%	0%	0%
Shared Lane Traffic (%)											
Turn Type	NA			NA			Prot			Prot	
Protected Phases	4			8			5			5	
Detector Phase	4			8			5			5	
Switch Phase											
Minimum Initial (s)	10.0			10.0			6.0			6.0	
Minimum Spill (s)	21.5			21.5			10.6			10.6	
Total Spill (s)	96.0			96.0			39.0			39.0	
Total Spill (%)	71.1%			71.1%			28.9%			28.9%	
Yellow Time (s)	3.6			3.6			3.6			3.6	
All-Red Time (s)	1.0			1.0			1.0			1.0	
Lost Time Adjust (s)	0.0			0.0			0.0			0.0	
Total Lost Time (s)	4.6			4.6			4.6			4.6	
Lead/Lag											
Lead-Lag Optimize?											
Recall Mode	C-Max			C-Max			None			None	
Intersection Summary											
Area Type:	Other										
Cycle Length:	135										
Actuated Cycle Length:	135										
Offset:	103 (76%), Referenced to phase 4:EBT and 8:WBT, Start of Red										
Natural Cycle:	40										
Control Type:	Actuated Coordinated										

Splis and Phases: 32: I-5 NB Ramps & Trosper Rd



HCM 2010 Signalized Intersection Summary 32: I-5 NB Ramps & Trosper Rd

Existing 2015
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL2	NBL	NBR	SEL	SER
Lane Configurations		4+1			4+1						
Traffic Volume (veh/h)	0	815	525	0	590	615	170	0	80	0	0
Future Volume (veh/h)	0	815	525	0	590	615	170	0	80	0	0
Number	7	4	14	3	8	18	5	5	12		
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0
Ped Bldg Adj (A _{pb})	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Adj Sat Flow, veh/hln	0	1881	1900	0	1881	1900	1881	1881	1881	1881	
Adj Flow Rate, veh/h	0	876	0	0	634	0	183	183	0		
Adj No of Lanes	0	3	0	0	2	0	1	1	1		
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93		
Percent Heavy Veh. %	0	1	1	0	1	1	1	1	1		
Arrive On Green	0	1886	0	0	2913	0	209	209	187		
Cap. veh/h	0	1.00	0.00	0.00	1.00	0.00	0.12	0.12	0.00		
Sat Flow, veh/h	0	5474	0	0	3762	0	1792	1792	1599		
Grp Volume(v), veh/h	0	876	0	0	634	0	183	183	0		
Grp Sat Flow(s), veh/hln	0	1712	0	0	1787	0	1792	1792	1599		
Q Serve(g.s), s	0.0	0.0	0.0	0.0	0.0	0.0	13.6	13.6	0.0		
Cycle Q Clear(g.c), s	0.0	0.0	0.0	0.0	0.0	0.0	13.6	13.6	0.0		
Prop In Lane	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00		
Lane Grp Cap(c), veh/h	0	4186	0	0	2913	0	209	209	187		
V/C Ratio(X)	0.00	0.21	0.00	0.00	0.22	0.00	0.87	0.87	0.00		
Avail Cap(C-a), veh/h	0	4186	0	0	2913	0	457	457	407		
HCM Platoon Ratio	1.00	2.00	2.00	1.00	1.67	1.67	1.00	1.00	1.00		
Upstream Filter(f)	0.00	0.70	0.00	0.00	0.61	0.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	58.6	58.6	0.0		
Incr Delay (d2), s/veh	0.0	0.1	0.0	0.0	0.1	0.0	4.4	4.4	0.0		
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackQ(50%),veh/hln	0.0	0.0	0.0	0.0	0.0	0.0	7.0	7.0	0.0		
LnGrp Delay(d), s/veh	0.0	0.1	0.0	0.0	0.1	0.0	63.1	63.1	0.0		
LnGrp LOS	A										
Approach Vol, veh/h	876										
Approach Delay, s/veh	0.1										
Approach LOS	A										
Timer	1	2	3	4	5	6	7	8			
Assigned Pts	2	2	4	4	5	6	7	8			
Pts Duration (G+Y+Rc), s	20.4		114.6					114.6			
Change Period (Y+Rc), s	4.6		4.6					4.6			
Max Green Setting (Gmax), s	34.4		91.4					91.4			
Max O Clear Time (g-c+1), s	15.6		2.0					2.0			
Green Ext Time (p.c.), s	0.2		12.9					12.9			
Intersection Summary											
HCM 2010 Ctrl Delay	6.9										
HCM 2010 LOS	A										

Lanes, Volumes, Timings

33: Capitol Blvd & Trospier Rd

Existing 2015
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	280	45	580	30	70	35	770	5/5	10	15	465	330
Future Volume (vph)	280	45	580	30	70	35	770	5/5	10	15	465	330
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0	50	0	250	0	100	0	100	200	200
Storage Lanes	1	1	1	1	1	0	1	0	1	1	1	1
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes		Yes	
Link Speed (mph)	30			30			30			30		
Link Distance (ft)	397			338			735			2664		
Travel Time (s)	9.0			7.7			16.7			60.5		
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)	42%						42%					
Turn Type	Split	NA	pm+ov	Split	NA		Split	NA		Split	NA	Perm
Permitted Phases	4	4	2	8	8		2	2		6	6	6
Detector Phase	4	4	2	8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	100	10.0	6.0	6.0	6.0		6.0	6.0		6.0	6.0	6.0
Minimum Spill (s)	206	20.6	29.6	28.6	28.6		29.6	29.6		34.6	34.6	34.6
Total Split (s)	206	20.6	51.2	28.6	28.6		51.2	51.2		34.6	34.6	34.6
Total Spill (%)	15.3%	15.3%	37.9%	21.2%	21.2%		37.9%	37.9%		25.6%	25.6%	25.6%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6		3.6	3.6		3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	4.6	4.6	4.6		4.6	4.6		4.6	4.6	4.6
Lead-Lag Optimizer?												
Recall Mode	None	None	C-Min	None	None		C-Min	C-Min		None	None	None
Area Type:	Other											
Cycle Length: 135												
Actuated Cycle Length: 135												
Offset: 6 (4%), Referenced to phase 2-NBT, Start of Red												
Natural Cycle: 145												
Control Type: Actuated-Coordinated												

Splits and Phases: 33: Capitol Blvd & Trospier Rd



HCM 2010 Signalized Intersection Summary

33: Capitol Blvd & Trospier Rd

Existing 2015
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	280	45	580	30	70	35	770	5/5	10	15	465	330
Future Volume (veh/h)	280	45	580	30	70	35	770	5/5	10	15	465	330
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Ob.) veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped Bike Adj (A _{pb})	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/hln	1881	1881	1881	1900	1900	1900	1881	1881	1900	1881	1881	1881
Adj Flow Rate, veh/h	315	0	359	30	71	35	456	1031	10	15	470	0
Adj No. of Lanes	2	0	1	1	1	0	1	2	0	1	2	1
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh. %	1	1	1	0	0	0	1	1	1	1	1	1
Cap. veh/h	403	0	1015	134	89	44	936	1943	19	277	553	248
Arrive On Green	0.04	0.00	0.04	0.07	0.07	0.07	0.69	0.69	0.69	0.15	0.15	0.00
Sat Flow veh/h	3583	0	1599	1810	1203	593	1792	3720	36	1792	3574	1599
Gp Volume(v), veh/h	315	0	359	30	0	106	456	521	520	15	470	0
Gp Sat Flow(s), veh/hln	1792	0	1599	1810	0	1795	1792	1881	1875	1792	1787	1599
Q Serve(g.s), s	11.8	0.0	13.0	2.1	0.0	7.8	15.9	18.1	18.1	1.0	17.3	0.0
Cycle Q Clear(g.c), s	11.8	0.0	13.0	2.1	0.0	7.8	15.9	18.1	18.1	1.0	17.3	0.0
Prop In Lane	1.00		1.00	1.00		0.33	1.00		0.02	1.00		1.00
Lane Gp Cap(c), veh/h	403	0	1015	134	0	133	936	982	979	277	553	248
Avl Ratio(X)	0.78	0.00	0.35	0.22	0.00	0.80	0.49	0.53	0.53	0.05	0.85	0.00
Avl Cap(C,a), veh/h	425	0	1025	322	0	319	936	982	979	398	794	355
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.33	1.33	1.33	0.00	1.00	1.00
Upstream Filter(f)	0.94	0.00	0.94	1.00	0.00	1.00	0.86	0.86	0.86	0.55	0.55	0.00
Uniform Delay (d), s/veh	63.3	0.0	12.3	58.8	0.0	61.5	12.3	12.6	12.6	48.6	55.5	0.0
Incr Delay (d2), s/veh	7.3	0.0	0.1	0.3	0.0	4.0	1.6	1.8	1.8	0.0	2.4	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackQ(50%), veh/h	6.3	0.0	13.5	1.1	0.0	4.0	8.1	9.8	9.8	0.5	8.7	0.0
LnGrp Delay(d), s/veh	70.7	0.0	12.4	59.1	0.0	65.5	13.8	14.4	14.4	48.6	58.0	0.0
LnGrp LOS	E		B	E		E	B	B	B	D	E	
Approach Vol, veh/h	674			136			1497			485		
Approach Delay, s/veh	39.6			64.1			14.2			57.7		
Approach LOS	D			E			B			E		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		75.1		19.8		25.5		14.6				
Change Period (Y+Rc), s		4.6		4.6		4.6		4.6				
Max Green Setting (Gmax), s		46.6		16.0		30.0		24.0				
Max Q Clear Time (q-clear), s		9.8		20.1		19.3		9.8				
Green Ext Time (p-c), s		5.6		0.2		1.6		0.2				

Intersection Summary

HCM 2010 Ctrl Delay	30.3
HCM 2010 LOS	C

Notes

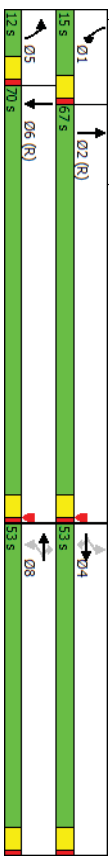
Lanes, Volumes, Timings

34: Capitol Blvd & Lee St

Existing 2015
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	260	5	40	15	5	80	25	1025	20	50	815	150
Future Volume (vph)	260	5	40	15	5	80	25	1025	20	50	815	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	125	0	0	100	250	0	200	0	200	0
Storage Lanes	0	0	1	0	0	1	1	0	1	0	1	0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes		Yes		Yes		Yes
Link Speed (mph)	30			30			30			30		
Link Distance (ft)	718			814			621			735		
Travel Time (s)	16.3			18.5			14.1			16.7		
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA	Prot	NA	Prot	NA
Permitted Phases	4	4	4	8	8	8	5	2		1	6	
Detector Phase	4	4	4	8	8	8	5	2		1	6	
Switch Phase												
Minimum Inhibit (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	12.0		6.0	12.0	
Minimum Spill (s)	29.0	29.0	29.0	30.0	30.0	30.0	11.0	25.0		11.0	25.0	
Total Spill (s)	53.0	53.0	53.0	53.0	53.0	53.0	12.0	67.0		15.0	70.0	
Total Split (%)	39.3%	39.3%	39.3%	39.3%	39.3%	39.3%	8.9%	49.6%		11.1%	51.9%	
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6		3.6	3.6	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6		4.6	4.6	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None	None	None	C-Max		None	C-Max	
Intersection Summary												
Area Type:	Other											
Cycle Length: 135												
Actuated Cycle Length: 135												
Offset: 130 (96%), Referenced to phase 2/NBT and 6/SBT Start of Red												
Natural Cycle: 70												
Control Type: Actuated-Coordinated												

Spills and Phases: 34: Capitol Blvd & Lee St



HCM Signalized Intersection Capacity Analysis

34: Capitol Blvd & Lee St

Existing 2015
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	260	5	40	15	5	80	25	1025	20	50	815	150
Future Volume (vph)	260	5	40	15	5	80	25	1025	20	50	815	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total lost time (s)	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Fit	1.00	0.85	1.00	0.85	1.00	0.85	1.00	0.85	1.00	0.85	1.00	0.85
Fit Protected	0.95	1.00	0.96	1.00	0.96	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Satd Flow (vph)	1793	1599	1615	1783	1615	1783	1615	1783	1615	1783	1615	1783
Fit Permitted	0.71	1.00	0.71	1.00	0.71	1.00	0.71	1.00	0.71	1.00	0.71	1.00
Satd Flow (vph)	1344	1599	1344	1599	1344	1599	1344	1599	1344	1599	1344	1599
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)	280	5	43	16	5	86	27	1102	22	54	876	161
RTOR Reduction (vph)	0	0	32	0	0	65	0	1	0	0	8	0
Lane Group Flow (vph)	0	285	11	0	21	21	27	1123	0	54	1029	0
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA	Prot	NA	Prot	NA
Permitted Phases	4	4	4	8	8	8	5	2		1	6	
Actuated Green, G (s)	33.6	33.6	33.6	33.6	33.6	33.6	4.3	80.4		7.2	83.3	
Effective Green, g (s)	33.6	33.6	33.6	33.6	33.6	33.6	4.3	80.4		7.2	83.3	
Actuated g/C Ratio	0.25	0.25	0.25	0.25	0.25	0.25	0.03	0.60		0.05	0.62	
Clearance Time (s)	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6		4.6	4.6	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	1.5	3.0		1.6	3.0	
Lane Grp Cap (vph)	334	397	351	401	351	401	56	2122		95	2154	
W/S Ratio Prot							0.02	c0.32		c0.03	c0.29	
W/S Ratio Perm	c0.21	0.01	0.01	0.01	0.01	0.01	0.01	0.01		0.01	0.01	
W/C Ratio	0.85	0.03	0.03	0.06	0.05	0.05	0.48	0.53		0.57	0.48	
Uniform Delay, d1	48.3	38.6	38.7	38.6	38.7	38.6	64.3	16.1		62.4	14.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		0.83	0.98	
Incremental Delay, d2	18.0	0.0	0.0	0.0	0.0	0.0	2.4	0.9		3.9	0.7	
Delay (s)	66.3	38.3	38.7	38.6	38.7	38.6	66.6	17.1		55.9	14.3	
Level of Service	E	D	D	D	D	D	E	B		E	B	
Approach Delay (s)	62.7			38.6			18.2			16.4		
Approach LOS	E			D			B			B		
Intersection Summary												
HCM 2000 Control Delay	23.7											
HCM 2000 Volume to Capacity ratio	0.62											
Actuated Cycle Length (s)	135.0											
Intersection Capacity Utilization	66.8%											
Analysis Period (min)	15											
C Critical Lane Group	C											

Lanes, Volumes, Timings

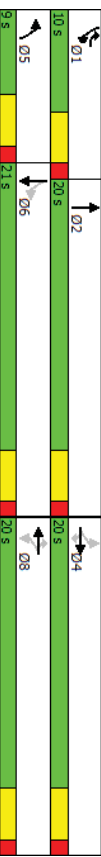
35: Litterlock Rd & Fred Meyer/Costco Drwy

Existing 2015
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4	4	4	4	4	4	4	4	4	4	4
Traffic Volume (vph)	0	0	0	130	5	115	0	650	95	105	585	0
Future Volume (vph)	0	0	0	130	5	115	0	650	95	105	585	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	0
Storage Length (ft)	0	0	0	0	0	100	0	175	0	175	0	0
Storage Lanes	0	0	1	0	1	1	1	0	1	1	0	0
Taper Length (ft)	25			25			25				25	
Right Turn on Red			Yes		Yes			Yes			Yes	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		390			426			713			896	
Travel Time (s)		8.9			9.7			16.2			20.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	Perm	Perm	Perm	NA	pm+ov	Prot	NA	pm+pl	NA	pm+pl	NA	NA
Permitted Phases	4	4	4	8	8	1	5	2	1	6	6	6
Detector Phase	4	4	4	8	8	1	5	2	1	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Spill (s)	200	200	200	200	200	9.0	9.0	200	9.0	200	200	200
Total Split (s)	200	200	200	200	200	10.0	9.0	200	10.0	21.0	21.0	21.0
Total Split (%)	40.0%	40.0%	40.0%	40.0%	40.0%	20.0%	18.0%	40.0%	20.0%	42.0%	42.0%	42.0%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
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	4.0
Lead/Lag						Lead		Lag		Lead		Lag
Lead-Lag Optimizer?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Max	None	Max	Max	Max

Area Type:	Other
Cycle Length: 50	
Actuated Cycle Length: 42.1	
Natural Cycle: 50	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 35: Litterlock Rd & Fred Meyer/Costco Drwy



HCM 2010 Signalized Intersection Summary

35: Litterlock Rd & Fred Meyer/Costco Drwy

Existing 2015
PM Peak Hour

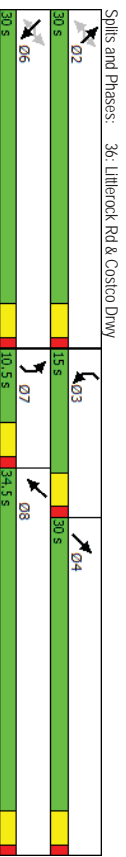
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4	4	4	4	4	4	4	4	4	4	4
Traffic Volume (veh/h)	0	0	0	130	5	115	0	650	95	105	585	0
Future Volume (veh/h)	0	0	0	130	5	115	0	650	95	105	585	0
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Obt) veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped Bike Adj (Adj)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/hln	1900	1900	1900	1881	1881	1881	1881	1900	1881	1881	1900	1900
Adj Flow Rate, veh/h	0	0	0	137	5	121	0	684	100	111	616	0
Adj No of Lanes	0	1	1	0	1	1	1	2	0	1	2	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh. %	0	0	0	1	1	1	1	1	1	1	1	1
Cap. veh/h	0	285	243	400	8	387	5	1355	198	550	2263	0
Arrive On Green	0.00	0.00	0.00	0.15	0.15	0.15	0.00	0.43	0.43	0.09	0.63	0.00
Sat Flow, veh/h	0	1900	1615	1387	51	1599	1792	3130	457	1792	3668	0
Gp Volume(v), veh/h	0	0	0	142	0	121	0	390	394	111	616	0
Gp Sat Flow(s), veh/hln	0	1900	1615	1438	0	1599	1792	1787	1800	1792	1787	0
Q SatFlow(s), s	0.0	0.0	0.0	3.4	0.0	2.3	0.0	5.9	5.9	1.0	2.8	0.0
Cycle Q Clear(g-c), s	0.0	0.0	0.0	3.4	0.0	2.3	0.0	5.9	5.9	1.0	2.8	0.0
Prop In Lane	0.00	1.00	0.96	1.00	1.00	1.00	1.00	0.25	1.00	1.00	0.00	0.00
Lane Gp Cap(c), veh/h	0	285	243	407	0	387	5	774	780	550	2263	0
Aval Ratio(X)	0.00	0.00	0.35	0.00	0.31	0.00	0.50	0.51	0.20	0.27	0.00	0.00
Adj Cap(C-a), veh/h	0	823	699	814	0	840	242	774	780	616	2263	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(f)	0.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	14.8	0.0	11.5	0.0	7.6	7.6	4.5	3.0	0.0
Incrl Delay (d2), s/veh	0.0	0.0	0.0	0.2	0.0	0.2	0.0	2.3	2.3	0.1	0.3	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackQ(50%),veh/hln	0.0	0.0	0.0	1.4	0.0	1.0	0.0	3.3	3.3	0.5	1.5	0.0
LnGrp Delay(d), s/veh	0.0	0.0	0.0	15.0	0.0	11.6	0.0	9.9	9.9	4.6	3.3	0.0
LnGrp LOS				B		B		A	A	A	A	
Approach Vol, veh/h		0			263			784			727	
Approach Delay, s/veh		0.0			13.5			9.9			3.5	
Approach LOS					B			A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Pks	1	2		4	5	6		8				
Pks Duration (G+Y+Rc), s	7.4	20.0		9.6	0.0	27.4		9.6				
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0				
Max Green Setting (Gmax), s	6.0	16.0		16.0	5.0	17.0		16.0				
Max Q Clear Time (q-c+1), s	3.0	7.9		0.0	0.0	4.8		5.4				
Green Ext Time (p-c), s	0.0	4.6		0.0	0.0	6.1		0.5				

Intersection Summary	
HCM 2010 Crt Delay	7.8
HCM 2010 LOS	A

Lanes, Volumes, Timings 36: Litterlock Rd & Costco Drwy

Existing 2015
PM Peak Hour

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	80	25	15	125	5	195	50	490	100	215	400	80
Future Volume (vph)	80	25	15	125	5	195	50	490	100	215	400	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	100	0	100	150	0	150	0	150	0	0
Storage Length (ft)	0	0	1	0	1	1	0	1	0	1	0	0
Taper Length (ft)	25			25			25				25	
Right Turn on Red												
Link Speed (mph)	30			30			30			30		Yes
Link Distance (ft)	325			608			995			713		
Travel Time (s)	7.4			13.8			22.6			16.2		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA		Prot	NA	
Permitted Phases	6	6	6	2	2	2	7	4		3	8	
Detector Phase	6	6	6	2	2	2	7	4		3	8	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Spill (s)	30.0	30.0	30.0	30.0	30.0	30.0	9.5	30.0		9.5	30.0	
Total Spill (s)	30.0	30.0	30.0	30.0	30.0	30.0	10.5	30.0		15.0	34.5	
Total Split (%)	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	14.0%	40.0%		20.0%	46.0%	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Allied Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.0			4.0			4.0			4.0		
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Recall Mode	Max	Max	Max	Max	Max	Max	None	None		None	None	
Intersection Summary												
Area Type:	Other											
Cycle Length: 75												
Actuated Cycle Length: 66.4												
Natural Cycle: 75												
Control Type: Actuated-Uncoordinated												



HCM Signalized Intersection Capacity Analysis 36: Litterlock Rd & Costco Drwy

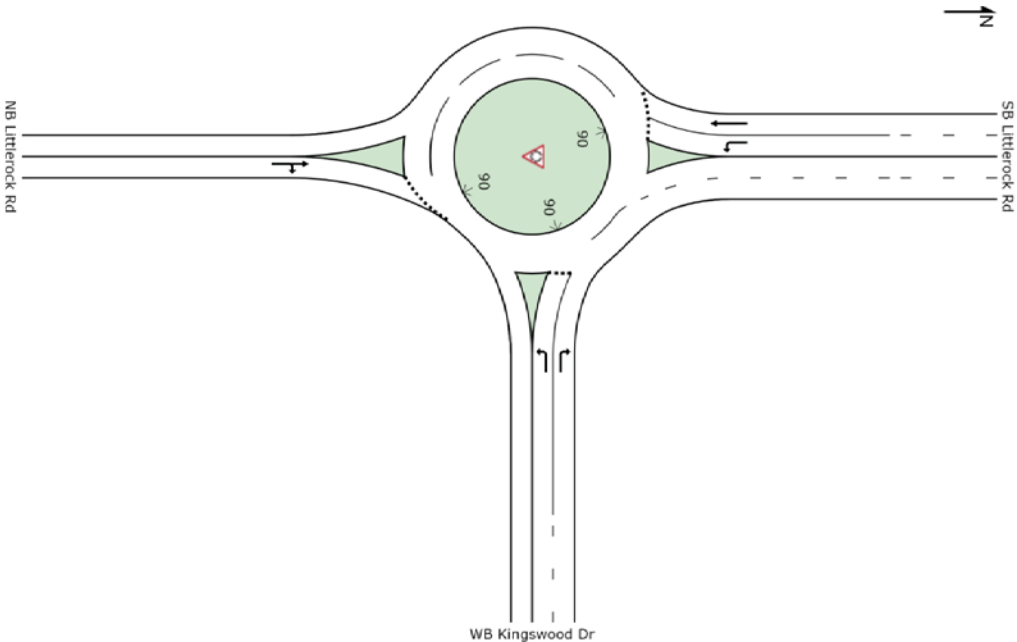
Existing 2015
PM Peak Hour

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	80	25	15	125	5	195	50	490	100	215	400	80
Future Volume (vph)	80	25	15	125	5	195	50	490	100	215	400	80
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	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Fit	1.00	0.85	1.00	1.00	0.85	1.00	0.97	1.00	0.98	1.00	0.98	1.00
Fit Protected	0.96	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Satd Flow (vph)	1830	1615	1813	1615	1787	3484	1787	3484	1787	3485	1787	3485
Fit Permitted	0.74	1.00	0.68	1.00	0.68	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Satd Flow (perm)	1406	1615	1287	1615	1787	3484	1787	3484	1787	3485	1787	3485
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)	84	26	16	132	5	205	53	516	105	226	421	84
RTOR Reduction (vph)	0	0	10	0	0	126	0	25	0	23	0	23
Lane Group Flow (vph)	0	110	6	0	137	79	53	596	0	226	482	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA	NA	Prot	NA	NA
Protected Phases	6	6	2	2	2	7	4			3	8	
Permitted Phases	6	6	2	2	2	7	4			3	8	
Actuated Green, G (s)	26.1	26.1	26.1	26.1	26.1	3.7	19.0			10.9	26.2	
Effective Green, g (s)	26.1	26.1	26.1	26.1	26.1	3.7	19.0			10.9	26.2	
Actuated g/C Ratio	0.38	0.38	0.38	0.38	0.38	0.05	0.28			0.16	0.39	
Clearance Time (s)	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	
Lane Grp Cap (vph)	539	619	493	619	97	973	286	1342		813	142	
W/S Ratio Prot	0.03						0.17			0.13	0.14	
W/S Ratio Perm	0.08	0.00		0.11	0.05					0.79	0.36	
W/C Ratio	0.20	0.01		0.28	0.13	0.55	0.61			0.79	0.36	
Uniform Delay, d1	14.0	13.0		14.5	13.6	31.3	21.3			27.5	14.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00			1.00	1.00	
Incremental Delay, d2	0.9	0.0		1.4	0.4	6.2	1.1			13.8	0.2	
(s)	14.9	13.0		15.8	14.0	37.5	22.4			41.2	15.1	
Level of Service	B	B		B	B	D	C			D	B	
Approach Delay (s)	14.6			14.7		23.6				23.2		
Approach LOS	B			B		C				C		

SITE LAYOUT

Site: 37) Litterrock Rd at Kingswood Dr

Existing 2015
PM Peak Hour
Roundabout



MOVEMENT SUMMARY

Site: 37) Litterrock Rd at Kingswood Dr

Existing 2015
PM Peak Hour
Roundabout

Movement Performance - Vehicles									
Mov ID	OD Mov	Demand Flows Total HV veh/h	Deg. of Satm %	Average Delay sec	Level of Service	95% Back of Queue Vehicles	Queue Distance ft	Prop. Queued	Effective Stop Rate per veh
South: NB Litterrock Rd									
8	T1	532	1.0	0.614	LOS A	5.4	136.6	0.38	0.44
18	R2	134	1.0	0.614	LOS A	5.4	136.6	0.38	0.44
Approach		667	1.0	0.614	LOS A	5.4	136.6	0.38	0.44
East: WB Kingswood Dr									
1	L2	194	1.0	0.198	LOS B	1.2	31.0	0.64	0.75
16	R2	81	1.0	0.049	LOS A	0.0	0.0	0.00	0.49
Approach		274	1.0	0.198	LOS A	1.2	31.0	0.45	0.57
North: SB Litterrock Rd									
7	L2	65	1.0	0.082	LOS B	0.4	10.7	0.44	0.65
4	T1	559	1.0	0.448	LOS A	3.5	89.2	0.53	0.52
Approach		624	1.0	0.448	LOS A	3.5	89.2	0.52	0.53
All Vehicles		1565	1.0	0.614	LOS A	5.4	136.6	0.45	0.52

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement. LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akecik M2D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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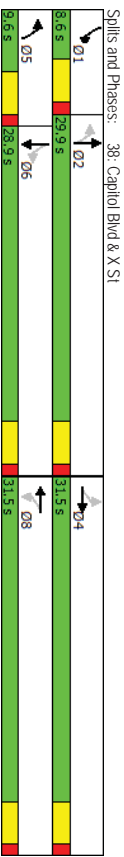
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SIDRA
INTERSECTION 6

Lanes, Volumes, Timings

Existing 2015
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	20	1	15	10	1	20	20	905	10	35	710	35
Future Volume (vph)	20	1	15	10	1	20	20	905	10	35	710	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100	0	100	0	150	0	250	0	250	0	250	0
Storage Lanes	1	0	1	1	0	1	1	0	1	1	1	0
Taper Length (ft)	25	0	25	0	25	0	25	0	25	0	25	0
Right Turn on Red	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Link Speed (mph)	30	30	30	30	30	30	30	30	30	30	30	30
Link Distance (ft)	642	642	642	1326	1326	1326	1300	1300	1368	1368	1368	1368
Travel Time (s)	14.6	14.6	14.6	30.1	30.1	30.1	29.5	29.5	31.1	31.1	31.1	31.1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)	0%	0%	0%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA	Perm	NA	pm+pl	NA	pm+pl	NA	pm+pl	NA	pm+pl	NA
Protected Phases	4	4	8	8	5	2	6	6	6	6	6	6
Permitted Phases	4	4	8	8	5	2	6	6	6	6	6	6
Detector Phase	4	4	8	8	5	2	6	6	6	6	6	6
Switch Phase	6.0	6.0	6.0	6.0	4.0	7.0	4.0	7.0	4.0	7.0	4.0	7.0
Minimum Initial (s)	31.5	31.5	31.5	31.5	9.5	25.5	8.5	26.5	8.5	26.5	8.5	26.5
Minimum Split (s)	31.5	31.5	31.5	31.5	9.6	29.9	8.6	28.9	8.6	28.9	8.6	28.9
Total Split (%)	45.0%	45.0%	45.0%	45.0%	13.7%	42.7%	12.3%	41.3%	12.3%	41.3%	12.3%	41.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
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	4.5
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimizer?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	None	None	None	None	None



HCM 2010 TWSC 39: Elm St & X St

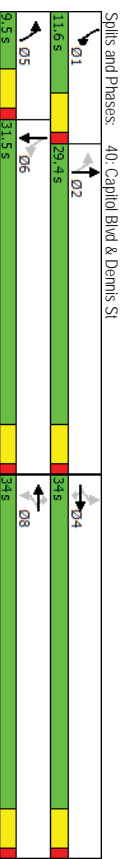
Existing 2015
PM Peak Hour

Intersection												
Int Delay, s/veh	2.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	5	10	10	5	5	2	2	65	5	0	45	5
Future Vol, veh/h	5	10	10	5	5	2	2	65	5	0	45	5
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	-	-	-	-	-	-	-	-	-	-	-	-
Vehicle in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	74	74	74	74	74	74	74	74	74	74	74	74
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	2	2	2
Wmtl Flow	7	14	14	7	7	3	88	7	0	61	7	0
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	165	164	64	175	165	91	68	0	0	95	0	0
Stage 1	64	64	-	97	97	-	-	-	-	-	-	-
Stage 2	101	100	-	78	68	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.12	-	-
Critical Hdwy Sig 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Sig 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.218	-	-
Plat Cap-1 Maneuver	804	732	1006	792	731	972	1546	-	-	1499	-	-
Stage 1	922	846	-	914	819	-	-	-	-	-	-	-
Stage 2	910	816	-	936	842	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Major Cap-1 Maneuver	795	731	1006	769	730	972	1546	-	-	1499	-	-
Major Cap-2 Maneuver	795	731	-	769	730	-	-	-	-	-	-	-
Stage 1	950	846	-	912	817	-	-	-	-	-	-	-
Stage 2	898	814	-	909	842	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	9.5	-	-	9.7	-	-	0.2	-	-	0	-	-
HCM LOS	A	-	-	A	-	-	-	-	-	-	-	-
Minor Lane/Major Wmtl	NBL	NBT	NBR	EBL	EBT	EBR	SBL	SBT	SBR			
Capacity (veh/h)	1546	-	-	836	779	1499	-	-	-			
HCM Lane V/C Ratio	0.002	-	-	0.04	0.021	-	-	-	-			
HCM Control Delay (s)	7.3	0	-	9.5	9.7	0	-	-	-			
HCM Lane LOS	A	A	-	A	A	-	-	-	-			
HCM 95th %ile Q(veh)	0	-	-	0.1	0.1	0	-	-	-			

Lanes, Volumes, Timings 40: Capitol Blvd & Dennis St

Existing 2015
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	4	4	4	4	4	4	4	4	4	4	4	4
Traffic Volume (vph)	145	40	30	30	20	75	10	690	25	50	575	70
Future Volume (vph)	145	40	30	30	20	75	10	690	25	50	575	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	125	0	100	175	0	225	0	0	225	0	0
Storage Lanes	0	1	1	0	1	1	1	1	0	1	1	0
Taper Length (ft)	25	25	25	25	25	25	25	25	25	25	25	25
Right Turn on Red	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Link Speed (mph)	30	30	30	30	30	30	30	30	30	30	30	30
Link Distance (ft)	834	834	834	834	834	834	834	834	834	834	834	834
Travel Time (s)	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)	Perm	NA	Perm	Perm	NA	Perm	pm+pl	NA	pm+pl	NA	pm+pl	NA
Protected Phases	4	4	4	8	8	8	5	2	6	1	6	6
Permitted Phases	4	4	4	8	8	8	5	2	6	1	6	6
Detector Phase	4	4	4	8	8	8	5	2	6	1	6	6
Switch Phase	7.0	7.0	7.0	7.0	7.0	7.0	5.0	8.0	7.0	8.0	7.0	8.0
Minimum Initial (s)	33.5	33.5	33.5	33.5	33.5	33.5	9.5	27.5	11.5	27.5	11.5	27.5
Minimum Spill (s)	34.0	34.0	34.0	34.0	34.0	34.0	9.5	29.4	11.6	29.4	11.6	29.4
Total Split (s)	45.3%	45.3%	45.3%	45.3%	45.3%	45.3%	12.7%	39.2%	15.5%	42.0%	15.5%	42.0%
Total Split (%)	45.3%	45.3%	45.3%	45.3%	45.3%	45.3%	12.7%	39.2%	15.5%	42.0%	15.5%	42.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
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	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead/Lag Optimizer?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	None	None	None	None	None
Intersection Summary	Other											
Area Type:	Other											
Cycle Length:	75											
Actuated Cycle Length:	58.5											
Natural Cycle:	75											
Control Type:	Actuated-Uncoordinated											



HCM Signalized Intersection Capacity Analysis

Existing 2015
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	
Traffic Volume (vph)	145	40	30	30	20	75	10	690	25	50	575	70	
Future Volume (vph)	145	40	30	30	20	75	10	690	25	50	575	70	
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	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	
Fit	1.00	0.85	1.00	1.00	0.85	1.00	0.99	1.00	0.98	1.00	0.98	1.00	
Fit Protected	0.96	1.00	0.96	1.00	0.97	1.00	0.95	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (vph)	1810	1599	1810	1599	1845	1615	1787	3556	1787	3516	1787	3516	
Fit Permitted	0.74	1.00	0.74	1.00	0.77	1.00	0.38	1.00	0.27	1.00	0.27	1.00	
Satd. Flow (vphpl)	1384	1599	1384	1599	1459	1615	719	3556	512	3516	512	3516	
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)	159	44	33	33	22	82	11	758	27	55	632	77	
RTOR Reduction (vph)	0	0	26	0	0	64	0	3	0	0	9	0	
Lane Group Flow (vph)	0	203	7	0	55	18	11	782	0	55	700	0	
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	1%	1%	1%	1%	1%	1%	
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	pm+pt	NA	NA	NA	
Protected Phases	4	4	8	8	8	2	5	2	1	6	1	6	
Permitted Phases													
Actuated Green, G (s)	13.7	13.7	13.7	13.7	13.7	31.8	30.9	38.0	34.0	38.0	34.0	34.0	
Effective Green, g (s)	13.7	13.7	13.7	13.7	13.7	31.8	30.9	38.0	34.0	38.0	34.0	34.0	
Actuated g/C Ratio	0.22	0.22	0.22	0.22	0.22	0.51	0.50	0.61	0.55	0.61	0.55	0.55	
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	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	3.0	
Lane Grp Cap (vph)	305	352	321	356	383	1769	395	1925	395	1925	395	1925	
W/S Ratio Pct	0.01	0.01	0.01	0.01	0.01	0.08	0.08	0.01	0.01	0.08	0.01	0.08	
W/S Ratio Perm	0.015	0.00	0.02	0.04	0.01	0.01	0.44	0.14	0.36	0.14	0.36	0.36	
V/C Ratio	0.67	0.02	0.17	0.05	0.03	0.03	0.44	0.14	0.36	0.14	0.36	0.36	
Uniform Delay, d1	22.1	18.9	19.1	19.6	19.1	7.4	10.0	5.4	7.9	5.4	7.9	7.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	5.4	0.0	0.3	0.1	0.0	0.8	0.2	0.5	0.2	0.5	0.2	0.5	
Delay (s)	27.5	19.0	19.1	19.9	19.1	7.5	10.9	5.5	8.5	5.5	8.5	8.5	
Level of Service	C	B	B	B	B	A	B	A	B	A	B	B	
Approach Delay (s)	26.3	19.4	10.8	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	
Approach LOS	C	B	B	B	B	A	B	A	B	A	B	B	
Intersection Summary													
HCM 2000 Control Delay	12.3					HCM 2000 Level of Service					B		
HCM 2000 Volume to Capacity ratio	0.48												
Actuated Cycle Length (s)	62.1					Sum of lost time (s)					13.5		
Intersection Capacity Utilization	53.8%					ICU Level of Service					A		
Analysis Period (min)	15												
Critical Lane Group													

Lanes, Volumes, Timings

Existing 2015
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	80	130	120	95	195	135	105	315	25	70	515	90
Future Volume (vph)	80	130	120	95	195	135	105	315	25	70	515	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0	150	0	150	0	150	0	100	0	0
Storage Lanes	1	0	0	1	0	1	0	1	0	1	0	0
Taper Length (ft)	25	0	25	25	0	25	25	0	25	25	0	25
Right Turn on Red	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Link Speed (mph)	30	30	30	30	30	30	30	30	30	30	30	30
Link Distance (ft)	2751	625	725	16.5	21.2	934	1337	1337	1337	1337	1337	1337
Travel Time (s)	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
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 (%)	0%	0%	0%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Turn Type	3	8	7	4	1	6	5	2	2	2	2	2
Protected Phases	3	8	7	4	1	6	5	2	2	2	2	2
Permitted Phases	8	8	4	4	6	6	6	6	6	6	6	6
Detector Phase	3	8	7	4	1	6	5	2	2	2	2	2
Switch Phase	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Minimum Initial (s)	10.5	26.5	10.5	26.5	10.5	26.5	10.5	26.5	10.5	26.5	10.5	26.5
Minimum Spill (s)	10.5	26.5	10.5	26.5	10.5	26.5	10.5	26.5	10.5	26.5	10.5	26.5
Total Spill (s)	14.0%	35.3%	14.0%	35.3%	14.0%	35.3%	14.0%	35.3%	14.0%	35.3%	14.0%	35.3%
Total Split (%)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Yellow Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lost Time Adjust (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Total Lost Time (s)	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead/Lag Optimizer?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	None	None	None	None	None
Intersection Summary												
Area Type:	Other											
Cycle Length: 75												
Actuated Cycle Length: 66.3												
Natural Cycle: 75												
Control Type: Actuated-Uncoordinated												
Spills and Phases:	41: Israel Rd & Capitol Blvd											
01	02	03	04	05	06	07	08	09	10	11	12	13
10.5 s	27.4 s	10.5 s	26.5 s	10.5 s	26.5 s	10.5 s	26.5 s	10.5 s	26.5 s	10.5 s	26.5 s	10.5 s

Existing 2015
PM Peak Hour

Synchro 9 Report
6/10/2016

Existing 2015
PM Peak Hour

Synchro 9 Report
6/10/2016

HCM 2010 TWSC
43: Kirsop Rd & 66th Ave

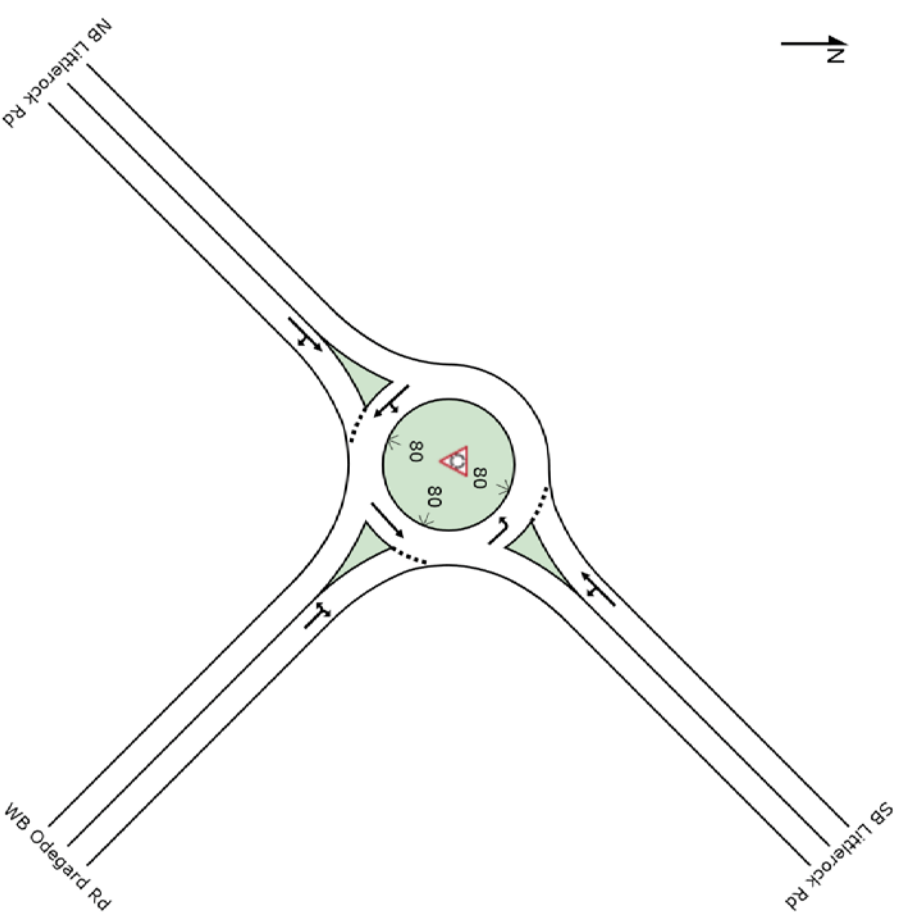
Existing 2015
PM Peak Hour

Intersection												
Int Delay, s/veh		7.7										
Movement												
Traffic Vol, veh/h	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Future Vol, veh/h	15	5	130	2	0	2	205	15	2	5	5	30
Conflicting Peds, #/hr	15	5	130	2	0	2	205	15	2	5	5	30
Sign Control	0	0	0	0	0	0	0	0	0	0	0	0
RT Channelized	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
Storage Length	-	-	None	-	-	None	-	-	None	-	-	None
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	84	84	84	84	84	84	84	84	84	84	84	84
Heavy Vehicles, %	1	1	1	0	0	0	1	1	1	0	0	0
Wmtl Flow	18	6	155	2	0	2	244	18	2	6	6	36
Major/Minor												
Conflicting Flow All	Mmnr2	544	544	24	Mmnr1	623	561	19	Major1	42	0	0
Stage 1	36	36	-	-	507	507	-	-	-	-	-	-
Stage 2	508	508	-	-	116	54	-	-	-	-	-	-
Critical Hdwy	7.11	6.51	6.21	-	7.1	6.5	6.2	-	4.11	-	4.1	-
Critical Hdwy Sig 1	6.11	5.51	-	-	6.1	5.5	-	-	-	-	-	-
Critical Hdwy Sig 2	6.11	5.51	-	-	6.1	5.5	-	-	-	-	-	-
Follow-up Hdwy	3.509	4.009	3.309	-	3.5	4	3.3	-	2.209	-	2.2	-
Plt Cap-1 Maneuver	451	448	1055	-	401	439	1065	-	1573	-	1609	-
Stage 1	982	867	-	-	552	543	-	-	-	-	-	-
Stage 2	549	540	-	-	894	854	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Max Cap-1 Maneuver	395	376	1055	-	297	369	1065	-	1573	-	1609	-
Max Cap-2 Maneuver	395	376	-	-	297	369	-	-	-	-	-	-
Stage 1	828	864	-	-	465	458	-	-	-	-	-	-
Stage 2	462	455	-	-	755	851	-	-	-	-	-	-
Approach												
HCM Control Delay, s	EB			WB			NB			SB		
HCM Control Delay, s	10.3			12.8			7.1			0.9		
HCM LOS	B			B								
Minor Lane/Major Wmtl												
Capacity (veh/h)	NBL	NBT	NBR	EBL	NBL	NBT	SBL	SBT	SBR			
Capacity (veh/h)	1573	-	-	860	464	1609	-	-	-			
HCM Lane V/C Ratio	0.155	-	-	0.208	0.01	0.004	-	-	-			
HCM Control Delay (s)	7.7	0	-	10.3	12.8	7.2	0	-	-			
HCM Lane LOS	A	A	-	B	B	A	A	-	-			
HCM 95th %ile Q(veh)	0.5	-	-	0.8	0	0	-	-	-			

SITE LAYOUT

Site: 44) Littlerock Rd at Odegard Rd

Existing 2015
PM Peak Hour
Roundabout



MOVEMENT SUMMARY

Site: 44) Littlerock Rd at Odegard Rd

Existing 2015
PM Peak Hour
Roundabout

Movement Performance - Vehicles									
Mov	OD	Demand Flows	Deg.	Average	Level of	95% Back of Queue	Pop.	Effective	Average
ID	Mov	Total	HV %	Delay	Service	Vehicles	Queued	Stop Rate	Speed
		veh/h		v/c	sec	veh	ft	per veh	mph
SouthEast: WB Odegard Rd									
3x	L2	16	0.0	0.030	13.6	0.2	3.9	0.64	0.70
18x	R2	5	0.0	0.030	8.2	0.2	3.9	0.64	0.70
Approach									
		22	0.0	0.030	12.2	0.2	3.9	0.64	0.70
NorthEast: SB Littlerock Rd									
1x	L2	11	1.0	0.594	9.6	6.8	172.4	0.21	0.39
6x	T1	720	1.0	0.594	4.4	6.8	172.4	0.21	0.39
Approach									
		731	1.0	0.594	4.4	6.8	172.4	0.21	0.39
SouthWest: NB Littlerock Rd									
2x	T1	667	1.0	0.541	4.3	5.0	127.2	0.14	0.39
12x	R2	5	1.0	0.541	4.2	5.0	127.2	0.14	0.39
Approach									
		672	1.0	0.541	4.3	5.0	127.2	0.14	0.39
All Vehicles									
		1425	1.0	0.594	4.5	6.8	172.4	0.18	0.39

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik MSD).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

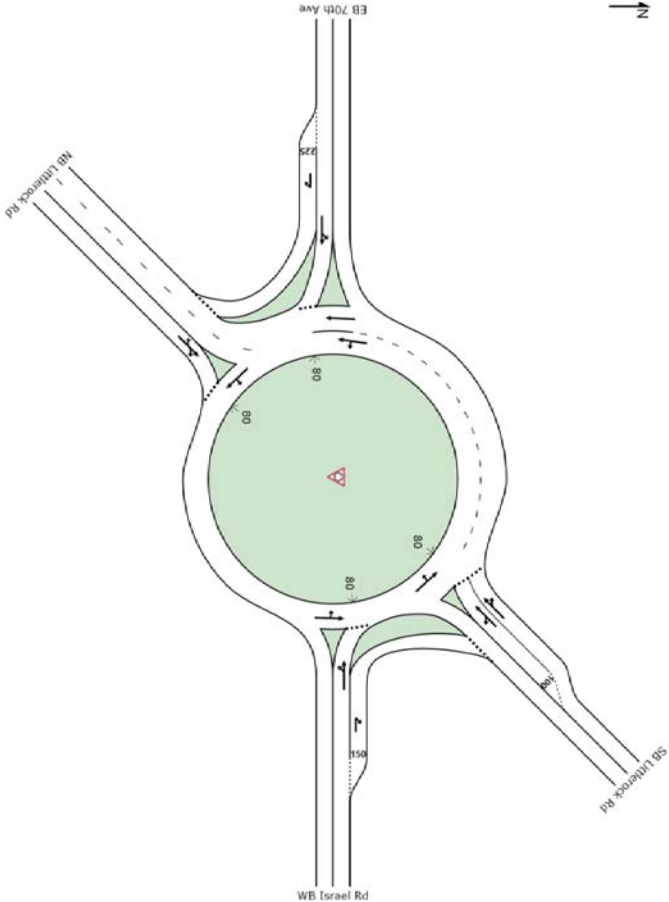
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SIDRA
INTERSECTION 6

SITE LAYOUT

Site: 45) Littlerock Rd at Israel Rd

Existing 2015
PM Peak Hour
Roundabout



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SIDRA
INTERSECTION 6

MOVEMENT SUMMARY

Site: 45) Littlerock Rd at Israel Rd

Existing 2015
PM Peak Hour
Roundabout

Movement Performance - Vehicles									
Mov	OD	Demand Flows	Deg. Satn	Average Delay	Level of Service	95% Back of Queue	Pop. Queued	Effective Stop Rate	Average Speed
ID	Mov	veh/h	%	sec		veh	Distance ft	per veh	mph
East WB Israel Rd									
1a	L1	58	1.0	0.259	LOS B	1.8	44.8	0.76	34.2
6	T1	158	1.0	0.259	LOS A	1.8	44.8	0.76	34.5
16b	R3	274	1.0	0.258	LOS A	1.7	41.6	0.66	34.9
Approach		489	1.0	0.259	LOS A	1.8	44.8	0.66	34.7
NorthEast SB Littlerock Rd									
1bx	L3	137	1.0	0.364	LOS B	2.4	60.0	0.69	34.3
6x	T1	426	1.0	0.364	LOS A	2.5	62.2	0.68	34.8
16ax	R1	121	1.0	0.364	LOS A	2.5	62.2	0.68	35.0
Approach		684	1.0	0.364	LOS A	2.5	62.2	0.68	34.7
West EB 70th Ave									
5a	L1	105	1.0	0.221	LOS B	1.0	25.7	0.58	34.3
2	T1	84	1.0	0.221	LOS A	1.0	25.7	0.58	34.7
12b	R3	79	1.0	0.085	LOS A	0.3	8.8	0.48	35.3
Approach		268	1.0	0.221	LOS A	1.0	25.7	0.55	34.7
SouthWest NB Littlerock Rd									
5bx	L3	253	1.0	0.606	LOS B	5.6	140.5	0.75	33.9
2x	T1	268	1.0	0.606	LOS A	5.6	140.5	0.75	33.6
12ax	R1	32	1.0	0.606	LOS A	5.6	140.5	0.75	33.4
Approach		553	1.0	0.606	LOS B	5.6	140.5	0.75	33.7
All Vehicles		1995	1.0	0.606	LOS A	5.6	140.5	0.68	34.4

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akcelik MSD).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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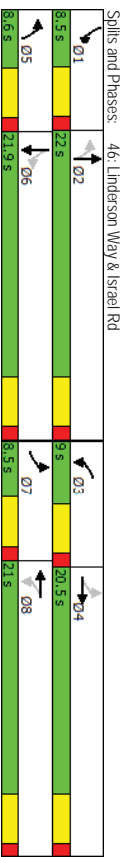
SIDRA
INTERSECTION 6

Lanes, Volumes, Timings
46: Linderson Way & Israel Rd

Existing 2015
PM Peak Hour










Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	165	30	135	260	25	110	85	110	40	80	50
Future Volume (vph)	40	165	30	135	260	25	110	85	110	40	80	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200	0	200	0	150	0	100	0	100	0	100	0
Storage Lanes	1	1	0	1	0	1	0	1	0	1	0	0
Taper Length (ft)	25		25		25		25		25		25	
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		3505			2751			2073			847	
Travel Time (s)		79.7			62.5			47.1			19.3	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	pm+pl	NA	pm+pl	NA	pm+pl	NA	pm+pl	NA	pm+pl	NA	pm+pl	NA
Protected Phases	7	4	3	8	5	2	1	6				
Permitted Phases	4		8		2		6					
Detector Phase	7	4	3	8	5	2	1	6				
Switch Phase												
Minimum Initial (s)	4.0	5.0	4.0	5.0	4.0	6.0	4.0	6.0				
Minimum Spill (s)	8.5	20.5	8.5	20.5	8.5	21.5	8.5	21.5				
Total Spill (s)	8.5	20.5	9.0	21.0	8.6	22.0	8.5	21.9				
Total Split (%)	14.2%	34.2%	15.0%	35.0%	14.3%	36.7%	14.2%	36.5%				
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5				
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0				
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimizer?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	None	None	None	None				

Intersection Summary		Other
Area Type:		
Cycle Length:	60	
Actuated Cycle Length:	52.4	
Natural Cycle:	60	
Control Type:	Actuated-Uncoordinated	



HCM 2010 Signalized Intersection Summary
46: Linderson Way & Israel Rd

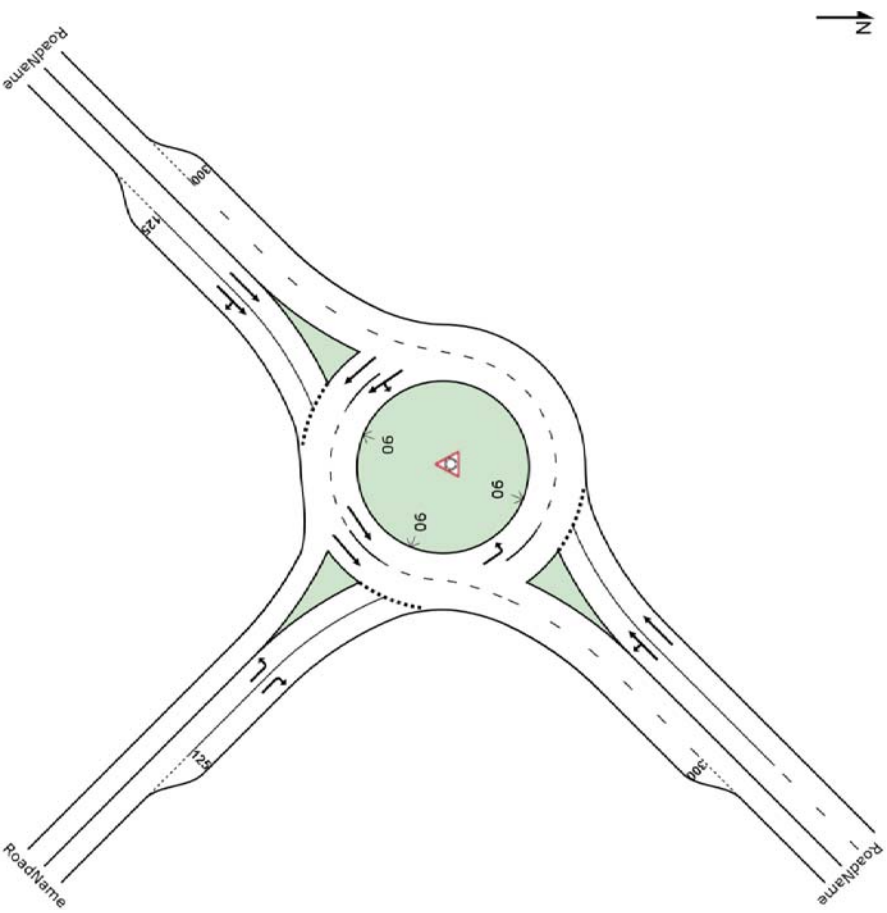
Existing 2015
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	165	30	135	260	25	110	85	110	40	80	50
Future Volume (veh/h)	40	165	30	135	260	25	110	85	110	40	80	50
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped Bike Adj(A, pb7)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/hln	1881	1881	1900	1881	1881	1900	1881	1881	1900	1881	1881	1900
Adj Flow Rate, veh/h	42	174	32	142	274	26	116	89	42	42	84	53
Adj No of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh %	1	1	1	1	1	1	1	1	1	1	1	1
Cap. veh/h	286	277	51	378	388	37	597	435	205	590	356	224
Arrive On Green	0.03	0.18	0.18	0.09	0.23	0.23	0.07	0.36	0.36	0.03	0.33	0.33
Sat Flow, veh/h	1792	1547	284	1792	1692	161	1792	1210	571	1792	1080	681
Grip Volume(V), veh/h	42	0	206	142	0	300	116	0	131	42	0	137
Grip Sat Flow(s), veh/hln	1792	0	1831	1792	0	1853	1792	0	1780	1792	0	1761
Q Serve(g, s)	1.0	0.0	5.5	3.3	0.0	7.9	2.2	0.0	2.7	0.8	0.0	3.0
Cycle Q Clear(g, c), s	1.0	0.0	5.5	3.3	0.0	7.9	2.2	0.0	2.7	0.8	0.0	3.0
Prop In Lane	1.00	0.16	1.00	0.09	1.00	0.09	1.00	0.32	1.00	0.39	0.00	0.39
Lane Grp Cap(c), veh/h	286	0	328	378	0	425	597	0	641	590	0	580
W/C Ratio(X)	0.15	0.00	0.63	0.38	0.00	0.71	0.19	0.00	0.24	0.07	0.00	0.24
Avail Cap(c, a), veh/h	360	0	555	378	0	579	619	0	641	663	0	580
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(f)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	17.0	0.0	20.0	15.7	0.0	18.7	10.4	0.0	11.7	10.9	0.0	12.9
Incr Delay (d2), s/veh	0.1	0.0	0.2	0.0	0.0	2.4	0.1	0.0	0.7	0.0	0.0	1.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOf(50%), veh/h	0.5	0.0	2.9	1.6	0.0	4.3	1.1	0.0	1.4	0.4	0.0	1.6
LnGrp Delay(d), s/veh	17.1	0.0	22.0	16.0	0.0	21.1	10.5	0.0	12.4	11.0	0.0	13.8
LnGrp LOS	B		C	B		C	B		B	B		B
Approach Vol, veh/h	248			442			247			179		
Approach Delay, s/veh	21.2			19.5			11.5			13.2		
Approach LOS	C			B			B			B		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rd), s	6.3	23.5	9.0	14.0	7.9	21.9	6.3	16.6				
Change Period (Y+Rd), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	4.0	17.5	4.5	16.0	4.1	17.4	4.0	16.5				
Max Q Clear Time (Q-clear), s	2.8	4.7	5.3	7.5	4.2	5.0	3.0	9.9				
Green Ext Time (p-c), s	0.0	1.2	0.0	2.0	0.0	1.2	0.0	1.7				
Intersection Summary												
HCM 2010 Ctrl Delay	17.1											
HCM 2010 LOS	B											

SITE LAYOUT

Site: 47) Litterrock Rd at Tumwater Blvd

Existing 2015
PM Peak Hour
Roundabout



MOVEMENT SUMMARY

Site: 47) Litterrock Rd at Turnwater Blvd

Existing 2015
PM Peak Hour
Roundabout

Movement Performance - Vehicles									
Mov	OD	Demand Flows	Deg. Satn	Average Delay	Level of Service	95% Back of Queue	Pop. Queued	Effective Stop Rate	Average Speed
ID	Mov	Total veh/s	HV %	sec		veh	Distance ft	per veh	mph
SouthEast: RoadName									
3x	L2	239	1.0	0.212	LOS B	1.1	26.8	0.32	0.64
18x	R2	298	1.0	0.251	LOS A	1.3	33.2	0.33	0.51
Approach									
		537	1.0	0.251	LOS A	1.3	33.2	0.32	0.57
NorthEast: RoadName									
1x	L2	324	1.0	0.365	LOS B	2.1	52.2	0.45	0.67
6x	T1	303	1.0	0.365	LOS A	2.1	52.2	0.43	0.56
Approach									
		628	1.0	0.365	LOS A	2.1	52.2	0.44	0.62
SouthWest: RoadName									
2x	T1	144	0.0	0.137	LOS A	0.7	16.7	0.44	0.52
12x	R2	112	0.0	0.115	LOS A	0.5	13.5	0.44	0.58
Approach									
		255	0.0	0.137	LOS A	0.7	16.7	0.44	0.55
All Vehicles									
		1420	0.8	0.365	LOS A	2.1	52.2	0.40	0.59
									35.2

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M&D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Processed: Friday, October 23, 2015 4:14:06 PM
SIDRA INTERSECTION 6.0.24.4877
Project: N:\Projects\0625.17 Turnwater Transportation Master Plan\TrafficOperations\sidra
Existing: 2015 PM.sip6
8001450, 6017302, SCJ ALLIANCE, PLUS / 1PC

**SIDRA
INTERSECTION 6**

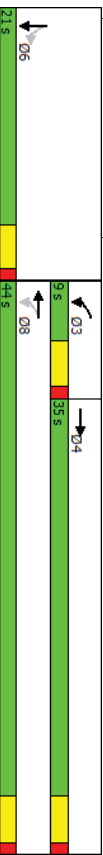
Lanes, Volumes, Timings
48: I-5 SB Ramps & Turnwater Blvd

Existing 2015
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	0	340	70	320	275	0	0	0	0	405	30	235
Future Volume (vph)	0	340	70	320	275	0	0	0	0	405	30	235
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0	0	0	0	0	0	0	350	0	0
Storage Lanes	0	0	0	0	0	0	0	0	0	1	0	0
Taper Length (ft)	25			25			25			25		
Right Turn on Red		Yes			Yes			Yes			Yes	
Link Speed (mph)	30			30			30			30		
Link Distance (ft)	1843			807			1457			1571		
Travel Time (s)	41.9			18.3			33.1			35.7		
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 (%)	1%	1%	1%	1%	1%	1%	0%	0%	0%	4%	4%	4%
Shared Lane Traffic (%)	NA			NA						14%		NA
Turn Type				pm+pt						Perm		NA
Protected Phases	4			3						6		6
Permitted Phases				8						6		6
Detector Phase	4			3						6		6
Switch Phase												
Minimum Initial (s)	4.0			4.0			4.0			4.0		4.0
Minimum Split (s)	20.5			8.5			20.5			20.5		20.5
Total Split (s)	35.0			9.0			44.0			21.0		21.0
Total Split (%)	53.8%			13.8%			67.7%			32.3%		32.3%
Yellow Time (s)	3.5			3.5			3.5			3.5		3.5
All-Red Time (s)	1.0			1.0			1.0			1.0		1.0
Lost Time Adjust (s)	0.0			0.0			0.0			0.0		0.0
Total Lost Time (s)	4.5						4.5			4.5		4.5
Lead/Lag	Lag			Lead								
Lead-Lag Optimize?	Yes			Yes								
Recall Mode	None			None			Max			None		None

Intersection Summary	
Area Type:	Other
Cycle Length:	65
Actuated Cycle Length:	64.6
Natural Cycle:	65
Control Type:	Actuated-Uncoordinated

Splits and Phases: 48: I-5 SB Ramps & Turnwater Blvd



HCM 2010 Signalized Intersection Summary

48: I-5 SB Ramps & Turnwater Blvd

Existing 2015
PM Peak Hour

PM Peak Hour

Movement	EBL	EET	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	340	70	320	275	0	0	0	0	405	30	235
Future Volume (veh/h)	0	340	70	320	275	0	0	0	0	405	30	235
Number	7	4	14	3	8	18	1	6	16	1	6	16
Initial Q (Ob.) veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped Bike Adj(A, pb1)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus. Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/hln	0	1881	1900	1900	1881	0	0	1827	1827	1900	1827	1900
Adj Flow Rate, veh/h	0	362	74	340	293	0	0	269	259	74	269	74
Adj No. of Lanes	0	2	0	0	1	0	1	1	1	0	1	0
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
Percent Heavy Veh %	0	1	1	1	1	1	0	4	4	4	4	4
Cap. veh/h	0	1864	377	90	26	0	0	336	311	89	336	311
Cap. veh/h	0	1864	377	90	26	0	0	336	311	89	336	311
Active On Green	0.00	0.63	0.63	0.63	0.63	0.00	0.23	0.23	0.23	0.23	0.23	0.23
Sat Flow, veh/h	0	3057	599	2	42	0	0	1740	1367	391	1740	1367
Grp Volume(y), veh/h	0	217	219	633	0	0	0	269	0	333	0	333
Grp Sat Flow(y), veh/hln	0	1787	1775	44	0	0	0	1740	0	1768	0	1768
Q Serve(g.s), s	0.0	3.2	3.3	17.2	0.0	0.0	0.0	8.9	0.0	11.3	0.0	11.3
Cycle Q Clear(g.c), s	0.0	3.2	3.3	17.2	0.0	0.0	0.0	8.9	0.0	11.3	0.0	11.3
Prop In Lane	0.00	0.34	0.54	0	0.00	0.00	0.22	1.00	0.68	0	400	0.22
Lane Grp Cap(c), veh/h	0	1124	1117	0	0	0	0	336	0	400	0	400
V/C Ratio(x)	0.00	0.19	0.20	0.00	0.00	0.00	0.00	0.68	0.00	0.83	0	0.83
Avail Cap(c, a), veh/h	0	1124	1117	0	0	0	0	457	0	462	0	462
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(i)	0.00	1.00	1.00	1.00	0.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	4.9	4.9	0.0	0.0	0.0	0.0	22.2	0.0	23.1	0.0	23.1
Incr Delay (d2), s/veh	0.0	0.1	0.1	0.0	0.0	0.0	0.0	3.3	0.0	11.0	0.0	11.0
Initial Q Delay(d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfC(50%), veh/ln	0.0	1.6	1.6	0.0	0.0	0.0	0.0	4.6	0.0	6.7	0.0	6.7
LnGrp Delay(d), s/veh	0.0	5.0	5.0	0.0	0.0	0.0	0.0	25.5	0.0	34.1	0.0	34.1
LnGrp LOS	A	A	A	C	C	C	C	C	C	C	C	C
Approach Vol, veh/h		436		633						602		
Approach Delay, s/veh		5.0		0.0						30.3		
Approach LOS		A		A						C		
Inter	1	2	3	4	5	6	7	8				
Assigned Phs				4		6		8				
Phs Duration (G+Y+R), s				44.0		18.8		44.0				
Change Period (Y+R), s				4.5		4.5		4.5				
Max Green Seling (Gmax), s				30.5		16.5		39.5				
Max Q Clear Time (G-C+I), s				5.3		13.3		19.2				
Green Ext Time (p, c), s				9.0		0.9		8.2				
Intersection Summary												
HCM 2010 Ctrl Delay	12.2											
HCM 2010 LOS	B											
100%												

HCM 2010 TWSC
49: I-5 NB Ramps & Turnwater Blvd

49: I-5 NB Ramps & Turnwater Blvd

Existing 2015
PM Peak Hour

PM Peak Hour

Intersection														
Int Delay, s/veh		5.5												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Traffic Vol, veh/h	135	610	0	0	550	1210	45	5	135	0	0	0		
Future Vol, veh/h	135	610	0	0	550	1210	45	5	135	0	0	0		
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	None		
RT Channelized	-	-	None	-	-	Free	-	-	None	-	-	None		
Storage Length	150	-	-	-	-	0	-	-	150	-	-	-		
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-		
Grade, %	-	0	-	-	-	0	-	-	0	-	-	-		
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88		
Heavy Vehicles, %	3	3	3	3	1	1	3	3	3	0	0	0		
Mnmt Flow	153	693	0	0	625	1375	51	6	153	0	0	0		
Major/Minor	Major1			Major2			Minor1							
Conflicting Flow All	625	0	-	-	-	0	1625	1625	347					
Stage 1	-	-	-	-	-	-	1000	1000	-					
Stage 2	-	-	-	-	-	-	625	625	-					
Critical Hdwy Sig 1	4,145	-	-	-	-	-	6,645	6,545	6,945					
Critical Hdwy Sig 2	-	-	-	-	-	-	5,845	5,545	-					
Follow-up Hdwy	2,2285	-	-	-	-	-	5,445	5,545	-					
Pot Cap-1 Maneuver	949	-	0	0	-	0	3,5285	4,0285	3,3285					
Stage 1	-	-	0	0	-	0	102	101	647					
Stage 2	-	-	0	0	-	0	316	318	-					
Platoon blocked, %	-	-	0	-	-	0	530	474	-					
Mov Cap-1 Maneuver	949	-	-	-	-	-	86	0	647					
Mov Cap-2 Maneuver	-	-	-	-	-	-	86	0	-					
Stage 1	-	-	-	-	-	-	265	0	-					
Stage 2	-	-	-	-	-	-	530	0	-					
Approach	EB			WB			NB							
HCM Control Delay, s	1.7	-	-	-	-	0	37.5	-	-	-	-	-		
HCM LOS	E													
Minor Lane(s)/Major Mnmt	NBLn1	NBLn2	EBL	EBT	WBL	WBT								
Capacity (veh/h)	86	647	949	-	-	-								
HCM Lane V/C Ratio	0.661	0.237	0.162	-	-	-								
HCM Control Delay (s)	105.7	12.3	9.5	-	-	-								
HCM Lane LOS	F	B	A	-	-	-								
HCM 95th %tile Q/veh	3.1	0.9	0.6	-	-	-								

Lanes, Volumes, Timings 50: Center St/Linderson Way & Turnwater Blvd

Existing 2015
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	135	550	155	55	700	30	170	85	45	190	160
Future Volume (vph)	135	550	155	55	700	30	170	85	45	190	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300	0	350	250	250	150	300	700	1	1	1
Storage Lanes	2	0	1	1	1	1	1	1	1	1	1
Taper Length (ft)	25	0	25	25	25	25	25	25	25	25	25
Right Turn on Red	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Link Speed (mph)	30	895	1275	30	1023	2073	47.1	0.94	0.94	0.94	0.94
Travel Time (s)	20.3	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
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
Heavy Vehicles (%)	2%	2%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)	Prot	NA	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Free
Turn Type	3	8	7	4	4	1	6	6	5	2	Free
Permitted Phases	3	8	7	4	4	1	6	6	5	2	Free
Detector Phase	3	8	7	4	4	1	6	6	5	2	Free
Switch Phase	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Minimum Initial (s)	11.0	31.0	11.0	31.0	31.0	11.0	31.0	11.0	31.0	31.0	31.0
Minimum Split (s)	11.0	31.0	11.0	31.0	31.0	12.0	31.0	31.0	12.0	31.0	31.0
Total Split (%)	12.9%	36.5%	12.9%	36.5%	14.1%	36.5%	14.1%	36.5%	14.1%	36.5%	36.5%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Allied Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimizer?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	None	Max	Max	None	None	None	None	None	None

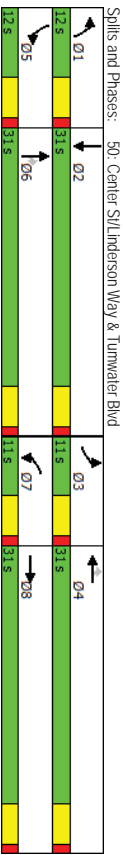
Area Type: Other

Cycle Length: 85

Actuated Cycle Length: 70.7

Natural Cycle: 85

Control Type: Actuated-Uncoordinated



HCM 2010 Signalized Intersection Summary 50: Center St/Linderson Way & Turnwater Blvd

Existing 2015
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (veh/h)	135	550	155	55	700	30	170	85	45	190	160
Future Volume (veh/h)	135	550	155	55	700	30	170	85	45	190	160
Number	3	8	18	7	4	14	1	6	16	5	2
Initial Q (Q ₀) veh	0	0	0	0	0	0	0	0	0	0	0
Ped Bike Adj (Adj _{pb})	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/hln	1863	1900	1881	1881	1881	1881	1881	1881	1881	1881	1881
Adj Flow Rate, veh/h	144	585	165	59	745	32	181	90	48	202	170
Adj No of Lanes	2	2	2	1	2	1	1	1	1	1	1
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
Percent Heavy Veh. %	2	2	2	1	1	1	1	1	1	1	1
Cap. veh/h	284	1108	312	106	1369	612	185	258	219	185	219
Arrive On Green	0.08	0.41	0.41	0.06	0.38	0.38	0.10	0.14	0.14	0.14	0.00
Sat Flow, veh/h	3442	2729	768	1792	3574	1599	1792	1881	1599	1792	1881
Gp Volume(v), veh/hln	144	379	371	59	745	32	181	90	48	202	170
Gp Sat Flow(s), veh/hln	1721	1770	1727	1792	1787	1599	1792	1881	1599	1792	1881
Q Served(s), s	2.7	11.0	11.0	2.2	11.0	0.9	6.8	2.9	1.8	7.0	5.8
Cycle Q Clear(c), s	2.7	11.0	11.0	2.2	11.0	0.9	6.8	2.9	1.8	7.0	5.8
Prop In Lane	1.00	0.44	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Gp Cap(c), veh/h	284	719	701	106	1369	612	185	258	219	185	219
Avl Ratio(X)	0.31	0.53	0.53	0.56	0.54	0.06	0.96	0.35	0.22	1.09	0.66
Avl Cap(C-a), veh/h	304	719	701	158	1369	612	185	258	219	185	219
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Filler(f)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	298	15.2	15.3	31.1	16.3	13.2	30.4	26.6	26.1	30.5	27.8
Incrl Delay (d ₂), s/veh	1.4	2.8	2.8	4.5	1.6	0.2	60.2	0.8	0.5	93.5	2.9
Initial Q Delay(d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackQ(50%),veh/hln	1.3	5.9	5.8	12	5.7	0.4	6.4	1.6	0.8	8.2	3.2
LnGrp Delay(d ₄), s/veh	312	18.0	18.1	35.5	17.9	13.4	90.6	27.4	26.6	123.9	30.7
LnGrp LOS	C	B	B	D	B	B	F	C	C	F	C
Approach Vol, veh/h	894	836	319	372	813	813	813	813	813	813	813
Approach Delay, s/veh	202	19.0	63.1	87.3	87.3	87.3	87.3	87.3	87.3	87.3	87.3
Approach LOS	C	B	E	F	F	F	F	F	F	F	F
Timer	1	2	3	4	5	6	7	8	9	10	11
Assigned Pns	1	2	3	4	5	6	7	8	9	10	11
Pns Duration (G+Y+Rc), s	120	14.3	10.6	31.0	12.0	14.3	9.0	32.6	12.0	14.3	9.0
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	7.0	26.0	7.0	26.0	7.0	26.0	4.0	26.0	7.0	26.0	4.0
Max Q Clear Time (q_c+1), s	8.8	7.8	4.7	13.0	9.0	4.9	4.2	13.0	9.0	4.9	4.2
Green Ext Time (p_c), s	0.0	1.5	0.1	7.9	0.0	1.6	0.0	7.9	0.0	1.6	0.0

Intersection Summary

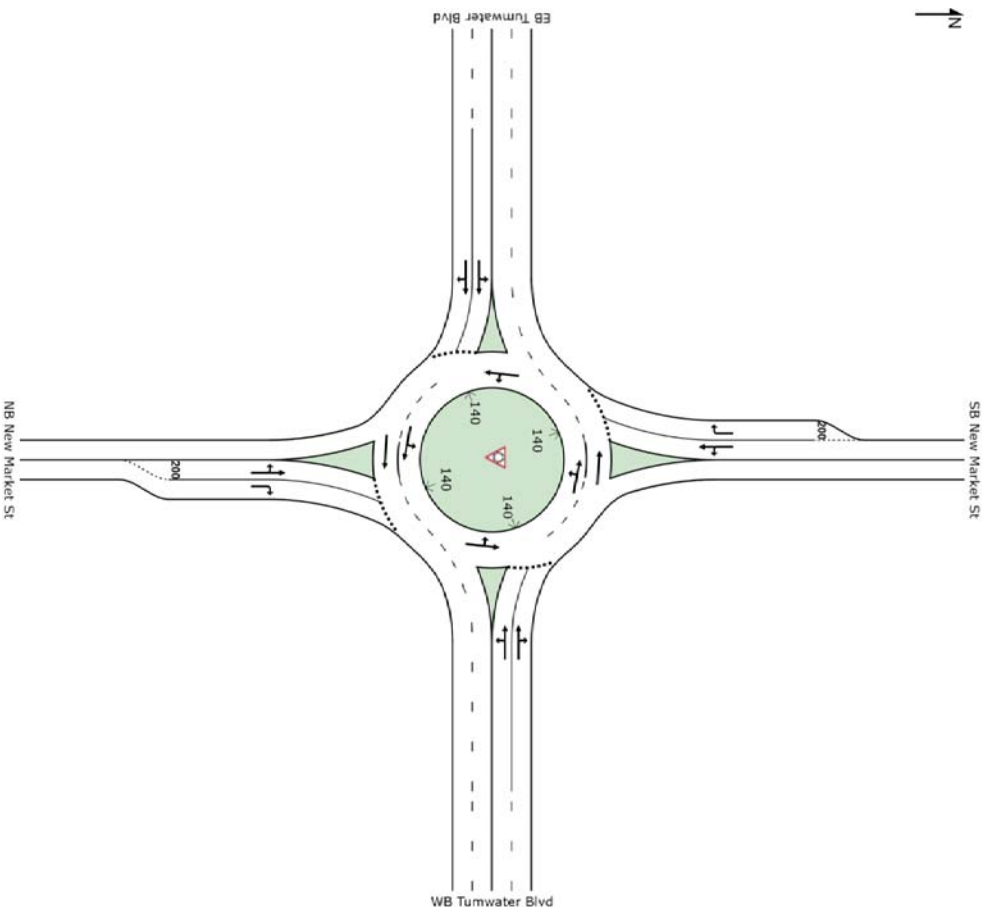
HCM 2010 Ctrl Delay

HCM 2010 LOS

SITE LAYOUT

Site: 51) New Market Rd at Tumwater Blvd

Existing 2015
PM Peak Hour
Roundabout



Created: Thursday, October 29, 2015 2:28:24 PM
SIDRA INTERSECTION 6.0.24.4877

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MOVEMENT SUMMARY

Site: 51) New Market Rd at Tumwater Blvd

Existing 2015
PM Peak Hour
Roundabout

Movement Performance - Vehicles										
Mov ID	OD Mov	Demand Flows Total HV veh/h	%	Deg. Satm v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles	Queue Distance ft	Prop. Queued	Effective Stop Rate per veh
South: NB New Market St										
3	L2	16	0.0	0.029	13.3	LOS B	0.1	2.6	0.57	0.76
8	T1	2	0.0	0.029	6.2	LOS A	0.1	2.6	0.57	0.76
18	R2	49	0.0	0.052	5.6	LOS A	0.2	5.1	0.54	0.65
Approach		67	0.0	0.062	7.5	LOS A	0.2	5.1	0.55	0.68
East: WB Tumwater Blvd										
1	L2	49	2.0	0.271	10.5	LOS B	1.7	42.4	0.20	0.38
6	T1	739	2.0	0.271	3.4	LOS A	1.7	42.7	0.19	0.34
16	R2	11	2.0	0.271	3.8	LOS A	1.7	42.7	0.19	0.32
Approach		799	2.0	0.271	3.8	LOS A	1.7	42.7	0.19	0.35
North: SB New Market St										
7	L2	33	4.0	0.072	13.3	LOS B	0.3	6.6	0.54	0.76
4	T1	16	4.0	0.072	6.2	LOS A	0.3	6.6	0.54	0.76
14	R2	114	4.0	0.121	5.7	LOS A	0.5	12.0	0.52	0.66
Approach		163	4.0	0.121	7.2	LOS A	0.5	12.0	0.53	0.69
West: EB Tumwater Blvd										
5	L2	27	4.0	0.323	10.8	LOS B	2.1	54.2	0.32	0.39
2	T1	842	4.0	0.323	3.7	LOS A	2.1	54.9	0.31	0.38
12	R2	22	4.0	0.323	4.1	LOS A	2.1	54.9	0.30	0.36
Approach		891	4.0	0.323	3.9	LOS A	2.1	54.9	0.31	0.38
All Vehicles		1921	3.0	0.323	4.3	LOS A	2.1	54.9	0.29	0.40

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akceik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Processed: Friday, October 23, 2015 4:21:53 PM
SIDRA INTERSECTION 6.0.24.4877
Project: N:\Projects\0625 City of Tumwater\0625_17 Tumwater Transportation Master Plan\Traffic\Operations\sidra
Existing 2015 PM.sip6
8001450, 8007302, SCJ ALLIANCE, PLUS / 1PC

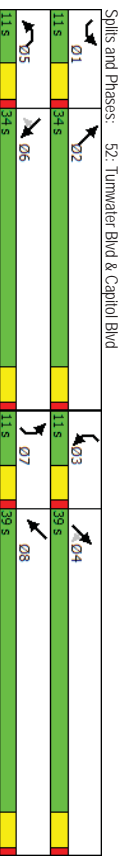
**SIDRA
INTERSECTION 6**

Lanes, Volumes, Timings 52: Tumwater Blvd & Capitol Blvd

Existing 2015
PM Peak Hour

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations	110	475	105	200	305	20	65	305	245	85	325	15
Traffic Volume (vph)	110	475	105	200	305	20	65	305	245	85	325	15
Future Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	250	0	200	0	275	0	200	0	200	0	200	0
Storage Length (ft)	1	2	1	2	0	1	1	1	1	1	1	0
Storage Lanes	25			25								
Taper Length (ft)					50			30				
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		50			3620			2404			1729	
Link Distance (ft)		934			49.4			54.6			39.3	
Travel Time (s)		12.7			0.90			0.90			0.90	
Peak Hour Factor		0.90			0.90			0.90			0.90	
Heavy Vehicles (%)		3%			3%			1%			1%	
Shared Lane Traffic (%)		3%			1%			1%			1%	
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Perm	Prot	NA	Prot	NA
Permitted Phases	1	6		5	2		7	4		4	3	8
Detector Phase	1	6	6	5	2		7	4	4	3	8	
Switch Phase												
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Minimum Split (s)	11.0	34.0	34.0	11.0	34.0	11.0	39.0	39.0	11.0	39.0	11.0	39.0
Total Split (s)	11.0	34.0	34.0	11.0	34.0	11.0	39.0	39.0	11.0	39.0	11.0	39.0
Total Split (%)	11.6%	35.8%	35.8%	11.6%	35.8%	11.6%	41.1%	41.1%	11.6%	41.1%	41.1%	39.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag
Lead-Lag Optimizer?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	Max	None	Max	None	None	None	None	None	None	None

Area Type:	Other
Cycle Length: 95	
Actuated Cycle Length: 82.1	
Natural Cycle: 95	
Control Type: Actuated-Uncoordinated	



HCM 2010 Signalized Intersection Summary 52: Tumwater Blvd & Capitol Blvd

Existing 2015
PM Peak Hour

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations	110	475	105	200	305	20	65	305	245	85	325	15
Traffic Volume (veh/h)	110	475	105	200	305	20	65	305	245	85	325	15
Future Volume (veh/h)	110	475	105	200	305	20	65	305	245	85	325	15
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Obs) veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped Bike Adj (Adj)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/hln	1845	1845	1845	1881	1881	1881	1881	1881	1881	1881	1881	1900
Adj Flow Rate, veh/h	122	528	39	222	339	22	72	339	33	94	361	17
Adj No of Lanes	1	1	2	2	2	0	1	1	1	1	2	0
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
Percent Heavy Veh. %	3	3	3	1	1	1	1	1	1	1	1	1
Cap. veh/h	132	669	569	261	1237	80	107	461	392	120	877	41
Arrive On Green	0.08	0.36	0.36	0.08	0.36	0.36	0.06	0.24	0.24	0.07	0.25	0.25
Sat Flow veh/h	1757	1845	1568	3476	3409	220	1792	1881	1599	1792	3476	163
Gp Volume(v), veh/h	122	528	39	222	177	184	72	339	33	94	185	193
Gp Sat Flow(s), veh/hln	1757	1845	1568	1738	1787	1842	1792	1881	1599	1792	1787	1852
Q Serve(g.s), s	5.5	20.4	1.3	5.0	5.6	5.7	3.1	13.3	1.3	4.1	6.9	7.0
Cycle Q Clear(g.c), s	5.5	20.4	1.3	5.0	5.6	5.7	3.1	13.3	1.3	4.1	6.9	7.0
Prop In Lane	1.00	1.00	1.00	1.00	0.12	1.00	1.00	1.00	1.00	1.00	1.00	0.09
Lane Gp Cap(c), veh/h	132	669	569	261	648	668	107	461	392	120	451	467
AVC Ratio(X)	0.93	0.79	0.07	0.85	0.27	0.28	0.67	0.74	0.08	0.78	0.41	0.41
Avail Cap(c), veh/h	132	669	569	261	648	668	134	800	680	134	781	788
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Filler(f)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.8	22.7	16.6	36.5	18.0	18.0	36.8	27.8	23.3	36.7	24.9	25.0
Initial Delay (d2), s/veh	56.0	9.2	0.2	22.6	1.0	1.0	4.8	2.3	0.1	19.8	0.6	0.6
%ile BackQ(50%), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LnGrp Delay(d), s/veh	4.7	12.1	0.6	3.2	2.9	3.1	1.7	7.2	0.6	2.7	3.5	3.6
LnGrp Delay(d), s/veh	92.8	31.9	16.9	59.1	19.1	19.1	41.6	30.1	23.4	56.6	25.5	25.5
LnGrp LOS	F	C	B	E	B	B	D	C	C	E	C	C
Approach Vol, veh/h	689			583			444			472		
Approach Delay, s/veh	41.8			34.3			31.5			31.7		
Approach LOS	D			C			C			C		
Timer	1	2	3	4	5	6	7	8				
Assigned Pns	1	2	3	4	5	6	7	8				
Pns Duration (G+Y+Rc), s	11.0	34.0	10.4	24.6	11.0	34.0	9.8	25.2				
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0				
Max Green Setting (Gmax), s	6.0	29.0	6.0	34.0	6.0	29.0	6.0	34.0				
Max Q Clear Time (q_c+1), s	7.5	7.7	6.1	15.3	7.0	22.4	5.1	9.0				
Green Ext Time (p.c.), s	0.0	6.1	0.0	4.3	0.0	3.1	0.0	4.7				

Intersection Summary	
HCM 2010 Ctrl Delay	35.5
HCM 2010 LOS	D

Lanes, Volumes, Timings

Existing 2015
PM Peak Hour

53: 65th Ave & Henderson Blvd

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	2	845	55	65	525	1	25	0	45	1	0	0
Future Volume (vph)	2	845	55	65	525	1	25	0	45	1	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100	0	150	0	0	0	0	0	0	0	0	0
Storage Lanes	1	0	1	1	0	0	0	0	0	0	0	0
Taper Length (ft)	25	0	25	0	25	0	25	0	25	0	25	0
Right Turn on Red	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Link Speed (mph)	30	30	30	30	30	30	30	30	30	30	30	30
Link Distance (ft)	2111	2111	1760	1760	704	704	354	8.0	8.0	8.0	8.0	8.0
Travel Time (s)	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Turn Type	Perm	2	Perm	6	Perm	8	Perm	8	Perm	4	Perm	4
Protected Phases	2	2	6	6	8	8	8	8	4	4	4	4
Detector Phase	2	2	6	6	8	8	8	8	4	4	4	4
Switch Phase	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Minimum Initial (s)	27.5	27.5	27.5	27.5	27.5	27.5	27.5	27.5	27.5	27.5	27.5	27.5
Minimum Spill (s)	52.5	52.5	52.5	52.5	52.5	52.5	52.5	52.5	52.5	52.5	52.5	52.5
Total Spill (s)	65.6%	65.6%	65.6%	65.6%	65.6%	65.6%	65.6%	65.6%	65.6%	65.6%	65.6%	65.6%
Total Split (%)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Yellow Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
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	4.5
Lead/Lag												
Lead-Lag Optimize?	Max	Max	Max	Max	Max	Max	None	None	None	None	None	None
Recall Mode	Max	Max	Max	Max	Max	Max	None	None	None	None	None	None
Area Type:	Other											
Cycle Length:	80											
Actuated Cycle Length:	74.1											
Natural Cycle:	80											
Control Type:	Actuated-Uncoordinated											

Splits and Phases: 53: 65th Ave & Henderson Blvd



HCM 2010 Signalized Intersection Summary

Existing 2015
PM Peak Hour

53: 65th Ave & Henderson Blvd

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (veh/h)	2	845	55	65	525	1	25	0	45	1	0	0
Future Volume (veh/h)	2	845	55	65	525	1	25	0	45	1	0	0
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (OB), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped Bike Adj (Adj)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/hln	1881	1881	1900	1881	1881	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	2	929	60	71	577	1	27	0	49	1	0	0
Adj No of Lanes	1	1	1	1	1	1	1	1	1	1	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh. %	1	1	1	1	1	1	1	1	1	1	1	1
Arrive On Green	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76
Cap. veh/h	667	1334	86	397	1432	2	116	14	96	263	0	0
Sat Flow veh/h	840	1748	113	573	1877	3	414	150	1023	1581	0	0
Gp Sat Flow(v), veh/h	2	0	989	71	0	578	76	0	1	0	0	0
Gp Sat Flow(s), veh/hln	840	0	1881	573	0	1881	1587	0	0	1581	0	0
Q Serve(g.s), s	0.1	0.0	16.9	4.5	0.0	6.6	1.3	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g.c), s	6.7	0.0	16.9	21.4	0.0	6.6	2.8	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00	0.06	1.00	0.06	1.00	0.00	0.36	0.64	1.00	0.00	0.00	0.00
Lane Gp Cap(c), veh/h	667	0	1420	397	0	1435	227	0	263	0	0	0
AVC Ratio(X)	0.00	0.00	0.70	0.18	0.00	0.40	0.34	0.00	0.00	0.00	0.00	0.00
Avail Cap(C,a), veh/h	667	0	1420	397	0	1435	647	0	637	0	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(f)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	3.7	0.0	3.8	9.2	0.0	2.6	21.0	0.0	0.0	25.8	0.0	0.0
Incrl Delay (d2), s/veh	0.0	0.0	2.8	1.0	0.0	0.8	1.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackQ(50%),veh/hln	0.0	0.0	9.4	0.8	0.0	3.7	1.3	0.0	0.0	0.0	0.0	0.0
LnGrp Delay(d), s/veh	3.7	0.0	6.6	10.2	0.0	3.4	28.1	0.0	25.8	0.0	0.0	0.0
LnGrp LOS	A	A	A	B	A	A	C	C	C	C	C	C
Approach Vol, veh/h	991	649	76	281	25.8	1						
Approach Delay, s/veh	6.6	4.1	C	C	C							
Approach LOS	A	A	C	C	C							
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	2	4	6	8								
Phs Duration (G+Y+Rc), s	52.5	10.4	52.5	10.4								
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5								
Max Green Setting (Gmax), s	48.0	23.0	48.0	23.0								
Max O Clear Time (G-c+I1), s	18.9	2.0	23.4	4.8								
Green Ext Time (p.c.), s	18.6	0.4	16.5	0.4								
Intersection Summary												
HCM 2010 Cnt Delay	6.6											
HCM 2010 LOS	A											

Lanes, Volumes, Timings

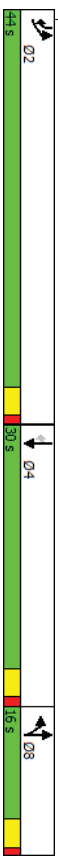
54: Henderson Blvd & Turnwater Blvd

Existing 2015

PM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	650	10	20	165	195	325
Future Volume (vph)	650	10	20	165	195	325
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0	0	100	100
Storage Lanes	1	0	0	0	1	1
Taper Length (ft)	25		25			
Right Turn on Red		Yes			Yes	
Link Speed (mph)	35		35		35	
Link Distance (ft)	3122		2394		2111	
Travel Time (s)	60.8		46.6		41.1	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Shield Lane Traffic (%)						
Turn Type	Prot		Split	NA	NA	pm+ov
Protected Phases	2		8	8	4	2
Permitted Phases						4
Detector Phase	2		8	8	4	2
Switch Phase						
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0	6.0
Minimum Spill (s)	20.5	10.5	10.5	30.0	20.5	20.5
Total Spill (s)	44.0	16.0	16.0	30.0	44.0	44.0
Total Split (%)	48.9%	17.8%	17.8%	33.3%	48.9%	48.9%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0		4.0		4.0	
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	Max		None	None	Max	Max
Intersection Summary						
Area Type:	Other					
Cycle Length:	90					
Actuated Cycle Length:	89.8					
Natural Cycle:	90					
Control Type:	Actuated-Uncoordinated					

Splits and Phases: 54: Henderson Blvd & Turnwater Blvd









HCM 2010 Signalized Intersection Summary

54: Henderson Blvd & Turnwater Blvd

Existing 2015

PM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations								
Traffic Volume (veh/h)	650	10	20	165	195	325		
Future Volume (veh/h)	650	10	20	165	195	325		
Number	5	12	3	8	4	14		
Initial Q (Ob), veh	0	0	0	0	0	0		
Ped Bike Adj(A _{pb}), pb/h	1.00	1.00	1.00			1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1881	1900	1900	1881	1881	1881		
Adj Flow Rate, veh/h	714	11	22	181	214	236		
Adj No. of Lanes	0	0	0	1	1	1		
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91		
Percent Heavy Veh. %	0	0	1	1	1	1		
Cap. veh/h	786	12	26	214	547	1179		
Arrive On Green	0.45	0.45	0.13	0.13	0.29	0.29		
Sat Flow, veh/h	1759	27	203	1668	1881	1599		
Gap Volume(v), veh/h	726	0	203	0	214	236		
Gap Sat Flow(s), veh/h/ln	1788	0	1871	0	1881	1599		
Q Serve(g, s), s	33.8	0.0	9.5	0.0	8.1	4.1		
Cycle Q Clear(g-c), s	33.8	0.0	9.5	0.0	8.1	4.1		
Prop In Lane	0.98	0.02	0.11			1.00		
Lane Grp Cap(c), veh/h	800	0	240	0	547	1179		
W/C Ratio(X)	0.91	0.00	0.85	0.00	0.39	0.20		
Avail Cap(C-a), veh/h	800	0	251	0	547	1179		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(f)	1.00	0.00	1.00	0.00	1.00	1.00		
Uniform Delay (d), s/veh	23.0	0.0	38.1	0.0	25.4	3.6		
Incr Delay (d2), s/veh	16.0	0.0	22.3	0.0	2.1	0.4		
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackQ(50%), veh/ln	20.1	0.0	6.4	0.0	4.5	5.0		
LnGrp Delay(d), s/veh	39.1	0.0	60.5	0.0	27.5	4.0		
LnGrp LOS	D		E		C	A		
Approach Vol, veh/h	726		203		450			
Approach Delay, s/veh	39.1		60.5		15.2			
Approach LOS	D		E		B			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4				8
Phs Duration (G+Y+Rc), s		44.0		30.0				15.5
Change Period (Y+Rc), s		4.0		4.0				4.0
Max Green Setting (Gmax), s		40.0		26.0				12.0
Max Q Clear Time (g-c+1), s		35.8		10.1				11.5
Green Ext Time (p-c), s		1.4		2.2				0.1

Intersection Summary

HCM 2010 Cnt Delay	34.4
HCM 2010 LOS	C

Notes

HCM 2010 TWSC 55: Henderson Blvd & Trails End Dr

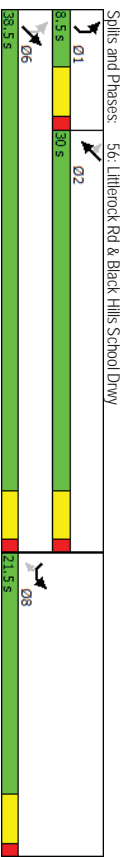
Existing 2015
PM Peak Hour

Intersection						
Int Delay, s/veh	3.8					
Movement	NWL	NWR	NET	NER	SWL	SWT
Traffic Vol, veh/h	55	50	150	90	95	140
Future Vol, veh/h	55	50	150	90	95	140
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	87	87	87	87	87	87
Heavy Vehicles, %	0	0	1	1	1	1
Wmnt Flow	63	57	172	103	109	161
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	603	224	0	0	276	0
Stage 1	224	-	-	-	-	-
Stage 2	379	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.11	-
Critical Hdwy Sig 1	5.4	-	-	-	-	-
Critical Hdwy Sig 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.209	-
Pot Cap-1 Maneuver	465	820	-	-	1293	-
Stage 1	818	-	-	-	-	-
Stage 2	696	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Max Cap-1 Maneuver	422	820	-	-	1293	-
Max Cap-2 Maneuver	422	-	-	-	-	-
Stage 1	818	-	-	-	-	-
Stage 2	631	-	-	-	-	-
Approach	NW		NE		SW	
HCM Control Delay, s	13.4		0		3.3	
HCM LOS	B					
Minor Lane/Major Wmnt	NET	NER	WLT	SWL	SWT	
Capacity (veh/h)	-	549	1293	-	-	
HCM Lane V/C Ratio	-	0.22	0.084	-	-	
HCM Control Delay (s)	-	13.4	8	0	-	
HCM Lane LOS	-	B	A	A		
HCM 95th %ile Q(veh)	-	0.8	0.3	-	-	

Lanes, Volumes, Timings 56: Littlerock Rd & Black Hills School Drwy







Existing 2015
PM Peak Hour

Lane Group	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Volume (vph)	5	5	10	160	390	50
Future Volume (vph)	5	5	10	160	390	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200	0	175	1900	350	350
Storage Lanes	1	1	1	1	1	1
Taper Length (ft)	25		25			
Right Turn on Red		Yes			Yes	
Link Speed (mph)	30			30	30	
Link Distance (ft)	1065			1067	3970	
Travel Time (s)	24.2			24.3	90.2	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	1%	1%	1%	1%
Shared Lane Traffic (%)						
Turn Type	Prot	Perm	pm+pl	NA	NA	Perm
Protected Phases	8	8	6	6	2	2
Permitted Phases	1	1	1	1	1	1
Detector Phase	8	8	1	6	2	2
Switch Phase						
Minimum Initial (s)	7.0	7.0	4.0	7.0	7.0	7.0
Minimum Spill (s)	21.5	21.5	8.5	24.5	27.5	27.5
Total Spill (s)	21.5	21.5	8.5	38.5	30.0	30.0
Total Split (%)	35.8%	35.8%	14.2%	64.2%	50.0%	50.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None	None	None	Max	None	None
Intersection Summary						
Area Type:	Other					
Cycle Length: 60						
Actuated Cycle Length: 54.5						
Natural Cycle: 60						
Control Type: Actuated-Uncoordinated						



HCM 2010 Signalized Intersection Summary 56: Litterock Rd & Black Hills School Drwy

Existing 2015
PM Peak Hour

Movement	SEL	SER	NEL	NET	SWT	SWR		
Lane Configurations								
Traffic Volume (veh/h)	5	5	10	160	390	50		
Future Volume (veh/h)	5	5	10	160	390	50		
Number	3	18	1	6	2	12		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped Bike Adj(A_pb7)	1.00	1.00	1.00	1.00	1.00	1.00		
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/hln	1900	1900	1881	1881	1881	1881		
Adj Flow Rate, veh/h	5	5	11	168	411	53		
Adj No. of Lanes	1	1	1	1	1	1		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95		
Percent Heavy Veh. %	0	0	1	1	1	1		
Cap. veh/h	33	30	715	1460	1245	1059		
Arrive On Green	0.02	0.02	0.01	0.78	0.66	0.66		
Sat Flow, veh/h	1810	1615	1792	1881	1881	1599		
Grip Volume(V), veh/h	5	5	11	168	411	53		
Grip Sat Flow(s), veh/hln	1810	1615	1792	1881	1881	1599		
Q Serve(q,s), s	0.1	0.1	0.1	1.0	4.1	0.5		
Cycle Q Clear(q,c), s	0.1	0.1	0.1	1.0	4.1	0.5		
Prop In Lane	1.00	1.00	1.00		1.00			
Lane Grip Cap(c), veh/h	33	30	715	1460	1245	1059		
V/C Ratio(X)	0.15	0.17	0.02	0.12	0.33	0.05		
Avail Cap(c), veh/h	702	627	858	1460	1245	1059		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(f)	1.00	1.00	1.00	1.00	1.00	1.00		
Uniform Delay (d), s/veh	21.2	21.2	2.2	1.2	3.2	2.6		
Incr Delay (d2), s/veh	2.1	2.7	0.0	0.2	0.2	0.0		
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackQ(50%), veh/hln	0.1	0.1	0.0	0.5	2.1	0.2		
LnGrp Delay(d), s/veh	23.2	23.8	2.2	1.4	3.4	2.6		
LnGrp LOS	C	C	A	A	A	A		
Approach Vol, veh/h	10			179	464			
Approach Delay, s/veh	23.5			1.4	3.3			
Approach LOS	C			A	A			
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2			6			8
Phs Duration (G+Y+Rd), s	5.0	33.5			38.5			5.3
Change Period (Y+Rd), s	4.5	4.5			4.5			4.5
Max Green Setting (Gmax), s	4.0	25.5			34.0			17.0
Max Q Clear Time (q_c+H), s	2.1	6.1			3.0			2.1
Green Ext Time (p_c), s	0.0	4.4			5.0			0.0
Intersection Summary								
HCM 2010 Ctrl Delay	3.1							
HCM 2010 LOS	A							

HCM 2010 TWSC 57: Center St & 76th Ave

Existing 2015
PM Peak Hour

Intersection		2.3															
Int Delay, s/veh																	
Movement		EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR				
Traffic Vol, veh/h		50	10	1	10	10	20		1	245	1	10	310	40			
Future Vol, veh/h		50	10	1	10	10	20		1	245	1	10	310	40			
Conflicting Peds, #/hr		0	0	0	0	0	0	0	0	0	0	0	0	0			
Sign Control		Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free			
RT Channelized		-	-	None	-	-	None	-	-	None	-	-	None	-			
Storage Length		-	-	-	-	-	-	-	-	-	-	-	-	-			
Veh in Median Storage, #		-	0	-	-	-	0	-	-	0	-	-	0	-			
Grade, %		-	0	-	-	-	0	-	-	0	-	-	0	-			
Peak Hour Factor		92	92	92	92	92	92	92	92	92	92	92	92	92			
Heavy Vehicles, %		3	3	3	11	11	11	1	1	1	1	3	3	3			
Mmnt Flow		54	11	1	11	11	22	1	266	1	11	337	43				
Major/Minor		Minor2				Minor1				Major1				Major2			
Conflicting Flow All		665	650	359		655	671	267		380	0	0	267	0			
Stage 1		380	380	-		269	269	-		-	-	-	-	-			
Stage 2		285	270	-		386	402	-		-	-	-	-	-			
Critical Hdwy		7.13	6.53	6.23		7.21	6.61	6.31		4.11	-	-	4.13	-			
Critical Hdwy Stg 1		6.13	5.53	-		6.21	5.61	-		-	-	-	-	-			
Critical Hdwy Stg 2		6.13	5.53	-		6.21	5.61	-		-	-	-	-	-			
Follow-up Hdwy		3.527	4.027	3.327		3.599	4.099	3.399		2.209	-	-	2.227	-			
Pot Cap-1 Maneuver		372	387	683		367	366	750		1184	-	-	1291	-			
Stage 1		640	612	-		717	670	-		-	-	-	-	-			
Platoon blocked, %		720	684	-		620	585	-		-	-	-	-	-			
Mov Cap-1 Maneuver		350	382	683		355	362	750		1184	-	-	1291	-			
Mov Cap-2 Maneuver		350	382	-		355	362	-		-	-	-	-	-			
Stage 1		639	605	-		716	669	-		-	-	-	-	-			
Stage 2		687	683	-		601	579	-		-	-	-	-	-			
Approach		EB				WB				NB				SB			
HCM Control Delay, s		17.3				13.2				0				0.2			
HCM LOS		C				B											
Minor Lane/Major Mmnt		NBL	NBT	NBR	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBT	SBR				
Capacity (veh/h)		1184	-	-	358	485	1291	-	-	-	-	-	-				
HCM Lane V/C Ratio		0.001	-	-	0.185	0.09	0.008	-	-	-	-	-	-				
HCM Lane LOS		8	0	-	17.3	13.2	7.8	0	-	-	-	-	-				
HCM Lane LOS		A	A	-	C	B	A	A	A	-	-	-	-				
HCM 95th %ile Q(veh)		0	-	-	0.7	0.3	0	-	-	-	-	-	-				

Lanes, Volumes, Timings 58: Old Hwy 99 & Henderson Blvd

Existing 2015
PM Peak Hour

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	105	815	10	2	510	110	15	5	5	140	5	50
Future Volume (vph)	105	815	10	2	510	110	15	5	5	140	5	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150	50	50	0	0	0	0	150	0	150	0	0
Storage Lanes	1	1	1	1	1	1	1	1	1	1	1	1
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes		Yes		Yes			Yes		Yes
Link Speed (mph)	50				50		30			30		30
Link Distance (ft)	3620				1652		415			2274		2274
Travel Time (s)	49.4				22.5		9.4			51.7		51.7
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	3%	3%	3%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	pm+pl	NA	Perm	Perm	NA	Perm	NA	Perm	NA	Perm	NA	NA
Protected Phases	1	6			2		4			8		8
Permitted Phases	6		6	2		2	4			8		8
Detector Phase	1	6	6	2	2	2	4	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Spill (s)	10.5	25.5	25.5	26.5	26.5	26.5	33.5	33.5	33.5	33.5	33.5	33.5
Total Spill (s)	11.0	56.5	56.5	45.5	45.5	45.5	33.5	33.5	33.5	33.5	33.5	33.5
Total Split (%)	12.2%	62.8%	62.8%	50.6%	50.6%	50.6%	37.2%	37.2%	37.2%	37.2%	37.2%	37.2%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimizer?	Yes			Yes	Yes		None	None	None	None	None	None
Recall Mode	None	Max	Max	Max	Max	Max	None	None	None	None	None	None
Intersection Summary												
Area Type:	Other											
Cycle Length:	90											
Actuated Cycle Length:	77.7											
Natural Cycle:	90											
Control Type:	Actuated-Uncoordinated											

Splits and Phases: 58: Old Hwy 99 & Henderson Blvd

01	02	03	04	05	06	07	08
11.5	5.5	33.5	33.5	33.5	33.5	33.5	33.5
56.5	5	5	5	5	5	5	5

HCM 2010 Signalized Intersection Summary 58: Old Hwy 99 & Henderson Blvd

Existing 2015
PM Peak Hour

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	105	815	10	2	510	110	15	5	5	140	5	50
Future Volume (veh/h)	105	815	10	2	510	110	15	5	5	140	5	50
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Ob) veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped Bike Adj (Adj)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/hln	1881	1881	1881	1863	1863	1900	1845	1900	1881	1881	1900	1900
Adj Flow Rate, veh/h	121	937	11	2	586	126	17	6	161	6	57	57
Adj No of Lanes	1	1	1	1	1	1	1	1	1	1	1	1
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh. %	1	1	1	2	2	2	3	3	3	1	1	1
Cap. veh/h	433	1342	1141	353	851	183	163	57	37	302	21	195
Arrive On Green	0.06	0.71	0.71	0.57	0.57	0.57	0.13	0.13	0.13	0.13	0.13	0.13
Sat Flow veh/h	1792	1881	1599	589	1487	320	627	428	275	1410	154	1468
Gp Volume(v), veh/h	121	937	11	2	0	712	29	0	0	161	0	63
Gp Sat Flow(s), veh/hln	1792	1881	1599	589	0	1806	1331	0	0	1410	0	1622
Q Serve(g.s), s	1.7	20.3	0.1	0.1	0.0	19.9	0.0	0.0	0.0	4.7	0.0	2.5
Cycle Q Clear(g.c), s	1.7	20.3	0.1	10.4	0.0	19.9	2.5	0.0	0.0	7.2	0.0	2.5
Prop In Lane	1.00	1.00	1.00	1.00	0.18	0.18	0.59	0.21	1.00	0.90	0.90	0.90
Lane Gp Cap(c), veh/h	433	1342	1141	353	0	1035	257	0	0	302	0	216
Avc Ratio(X)	0.28	0.70	0.01	0.01	0.00	0.69	0.11	0.00	0.00	0.53	0.00	0.29
Avail Cap(c), veh/h	457	1342	1141	353	0	1035	633	0	0	666	0	635
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(f)	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	8.3	5.9	3.0	11.7	0.0	10.8	21.3	0.0	0.0	29.8	0.0	28.0
Incr Delay (d2), s/veh	0.1	3.0	0.0	0.0	0.0	3.7	0.1	0.0	0.0	0.5	0.0	0.3
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackQ(50%),veh/hln	0.9	11.5	0.1	0.0	0.0	10.8	0.5	0.0	0.0	3.1	0.0	1.1
LnGrp Delay(d), s/veh	8.4	8.9	3.0	11.7	0.0	14.5	21.4	0.0	0.0	30.4	0.0	28.2
LnGrp LOS	A	A	A	B	B	B	C	C	C	C	C	C
Approach Vol, veh/h	1069											
Approach Delay, s/veh	8.8											
Approach LOS	A											
Timer	1	2	3	4	5	6	7	8				
Assigned Pts	1	2		4		6		8				
Pts Duration (G+Y+R), s	100	46.5		15.0		56.5		15.0				
Change Period (Y+R), s	5.5	5.5		5.5		5.5		5.5				
Max Green Setting (Gmax), s	5.5	40.0		28.0		51.0		28.0				
Max Q Clear Time (q_c+1), s	3.7	21.9		4.5		22.3		9.2				
Green Ext Time (p_c), s	0.0	10.5		0.4		13.5		0.3				
Intersection Summary												
HCM 2010 Ctrl Delay	13.4											
HCM 2010 LOS	B											

HCM 2010 TWSC
59: Old Hwy 99 & 79th Ave

Existing 2015
PM Peak Hour

Intersection													
Int Delay, s/veh													
2.2													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR	
Traffic Vol, veh/h	1	1	10	10	0	110	130	840	0	1	430	15	
Future Vol, veh/h	1	1	10	10	0	110	130	840	0	1	430	15	
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None	
Storage Length	-	-	-	-	-	300	250	0	-	-	-	-	
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	-	0	
Grade, %	-	0	-	-	-	0	-	-	-	-	-	0	
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95	
Heavy Vehicles, %	2	2	2	1	1	1	1	1	1	1	1	1	
Mvmt Flow	1	1	11	11	0	116	137	884	0	1	453	16	

Major/Minor	Minor1			Minor2			Major1			Major2		
Conflicting Flow All	1621	1629	884	1627	1621	461	468	0	0	884	0	0
Stage 1	1158	1158	-	463	463	-	-	-	-	-	-	-
Stage 2	463	471	-	1164	1158	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.11	6.51	6.21	4.11	-	-	4.11	-	-
Critical Hdwy Sig 1	6.12	5.52	-	6.11	5.51	-	-	-	-	-	-	-
Critical Hdwy Sig 2	6.12	5.52	-	6.11	5.51	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.509	4.009	3.309	2.209	-	-	2.209	-	-
Pot Cap-1 Maneuver	83	102	344	82	103	603	1099	-	-	770	-	-
Stage 1	239	270	-	581	566	-	-	-	-	-	-	-
Stage 2	579	560	-	238	272	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	61	89	344	71	90	603	1099	-	-	770	-	-
Mov Cap-2 Maneuver	61	89	-	71	90	-	-	-	-	-	-	-
Stage 1	209	236	-	509	565	-	-	-	-	-	-	-
Stage 2	467	559	-	201	238	-	-	-	-	-	-	-

Approach	EB	WB	SE	NW					
HCM Control Delay, s	23.1	16.7	1.2	0					
HCM LOS	C	C							
Minor Lane/Major Mvmt	NWL	NWT	NWR	EBL	WBL	R2	SEL	SET	SER
Capacity (veh/h)	770	-	212	71	603	1099	-	-	-
HCM Lane V/C Ratio	0.001	-	0.06	0.148	0.192	0.125	-	-	-
HCM Control Delay (s)	9.7	0	23.1	64.3	12.4	8.7	-	-	-
HCM Lane LOS	A	A	C	F	B	A	-	-	-
HCM 95th %ile Q(veh)	0	-	0.2	0.5	0.7	0.4	-	-	-

HCM 2010 TWSC
60: Kimmie St & 83rd Ave

Existing 2015
PM Peak Hour

Intersection													
Int Delay, s/veh													
3.5													
Movement	WBL	WBR	NBT	NBR	SBL	SBT							
Traffic Vol, veh/h	45	15	30	15	5	60							
Future Vol, veh/h	45	15	30	15	5	60							
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	-	0	-	-	-							
Veh in Median Storage, #	0	-	0	-	-	0							
Grade, %	0	-	0	-	-	0							
Peak Hour Factor	82	82	82	82	82	82							
Heavy Vehicles, %	3	3	9	9	3	3							
Mvmt Flow	55	18	37	18	6	73							

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	131	46	-	0	0	55	0	-	-
Stage 1	46	-	-	-	-	-	-	-	-
Stage 2	85	-	-	-	-	-	-	-	-
Critical Hdwy	6.43	6.23	-	-	-	4.13	-	-	-
Critical Hdwy Sig 1	5.43	-	-	-	-	-	-	-	-
Critical Hdwy Sig 2	5.43	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	3.327	-	-	-	2.227	-	-	-
Pot Cap-1 Maneuver	861	1021	-	-	-	1544	-	-	-
Stage 1	974	936	-	-	-	-	-	-	-
Stage 2	936	-	-	-	-	-	-	-	-
Platoon blocked, %									
Mov Cap-1 Maneuver	858	1021	-	-	-	1544	-	-	-
Mov Cap-2 Maneuver	858	-	-	-	-	-	-	-	-
Stage 1	974	-	-	-	-	-	-	-	-
Stage 2	932	-	-	-	-	-	-	-	-

Approach	WB		NB		SB	
HCM Control Delay, s	9.4		0		0.6	
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBR	WBL	SBL	SBT	
Capacity (veh/h)	-	894	1544	-	-	
HCM Lane V/C Ratio	-	0.082	0.004	-	-	
HCM Control Delay (s)	-	9.4	7.3	0	-	
HCM Lane LOS	-	A	A	A	A	
HCM 95th %ile Q(veh)	-	0.3	0	-	-	













HCM 2010 TWSC 61 : 83rd Ave & Center St

Existing 2015
PM Peak Hour

Intersection									
Int Delay, s/veh	7.8								
Movement	EBL	EBT	WBT	WBR	SBL	SBR			
Traffic Vol, veh/h	70	25	10	90	155	70			
Future Vol, veh/h	70	25	10	90	155	70			
Conflicting Peds, #/hr	0	0	0	0	0	0			
Sign Control	Free	Free	Free	Free	Stop	Stop			
RT Channelized	-	None	-	None	-	None			
Storage Length	-	-	-	-	0	-			
Veh in Median Storage, #	-	0	0	-	0	-			
Grade, %	-	0	0	-	0	-			
Peak Hour Factor	88	88	88	88	88	88			
Heavy Vehicles, %	1	1	3	3	1	1			
Wmtl Flow	80	28	11	102	176	80			
Major/Minor	Major1		Major2		Minor2				
Conflicting Flow All	114	0	-	0	251	63			
Stage 1	-	-	-	-	63	-			
Stage 2	-	-	-	-	188	-			
Critical Hdwy	4.11	-	-	-	7.11	6.21			
Critical Hdwy Sig 1	-	-	-	-	6.11	-			
Critical Hdwy Sig 2	-	-	-	-	6.11	-			
Follow-up Hdwy	2.209	-	-	-	3.509	3.309			
Pot Cap-1 Maneuver	1481	-	-	-	704	1004			
Stage 1	-	-	-	-	950	-			
Stage 2	-	-	-	-	816	-			
Platoon blocked, %	-	-	-	-	-	-			
Moar Cap-1 Maneuver	1481	-	-	-	674	1004			
Moar Cap-2 Maneuver	-	-	-	-	674	-			
Stage 1	-	-	-	-	898	-			
Stage 2	-	-	-	-	771	-			
Approach	EB		WB		SB				
HCM Control Delay, s	5.6	-	0	-	12.2	-			
HCM LOS	-	-	-	-	B	-			
Minor Lane/Major Wmtl	EBL	EBT	WBT	WBR	SBL	SBR			
Capacity (veh/h)	1481	-	-	-	751	-			
HCM Lane V/C Ratio	0.054	-	-	-	0.34	-			
HCM Control Delay (s)	7.6	0	-	-	12.2	-			
HCM Lane LOS	A	A	-	-	B	-			
HCM 95th %ile D(veh)	0.2	-	-	-	1.5	-			

Lanes, Volumes, Timings 62: 88th Ave & Old Hwy 99

Existing 2015
PM Peak Hour

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR	
Lane Configurations													
Traffic Volume (vph)	0	670	175	5	270	0	180	5	25	2	5	1	
Future Volume (vph)	0	670	175	5	270	0	180	5	25	2	5	1	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	100	150	150	150	0	150	0	150	0	0	0	0	
Storage Lanes	1	1	1	1	1	1	1	1	1	0	0	0	
Taper Length (ft)	25			25			25			25			
Right Turn on Red			Yes			Yes			Yes			Yes	
Link Speed (mph)	50	50		50		50		30		30		30	
Link Distance (ft)	3849	3849		1410		1410		1160		1160		265	
Travel Time (s)	52.5	52.5		19.2		19.2		26.4		26.4		6.0	
Peak Hour Factor	0.92	0.90	0.90	0.90	0.90	0.92	0.90	0.92	0.90	0.92	0.92	0.92	
Heavy Vehicles (%)	2%	1%	1%	1%	1%	2%	3%	2%	3%	2%	2%	2%	
Shared Lane Traffic (%)													
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA	Perm	NA	NA	
Protected Phases	6	6	6	2	2	4	4	4	4	8	8	8	
Permitted Phases	6	6	6	2	2	4	4	4	4	8	8	8	
Detector Phase	6	6	6	2	2	4	4	4	4	8	8	8	
Switch Phase													
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Minimum Split (s)	26.0	26.0	26.0	26.0	26.0	24.0	24.0	26.0	26.0	26.0	26.0	26.0	
Total Split (s)	34.0	34.0	34.0	34.0	34.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	
Total Split (%)	56.7%	56.7%	56.7%	56.7%	56.7%	43.3%	43.3%	43.3%	43.3%	43.3%	43.3%	43.3%	
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lead/Lag													
Lead-Lag Optimizer?													
Recall Mode	Max	Max	Max	Max	Max	None	None	None	None	None	None	None	
Intersection Summary													
Area Type:	Other												
Cycle Length: 60													
Actuated Cycle Length: 55.2													
Natural Cycle: 60													
Control Type: Actuated-Uncoordinated													
Spills and Phases: 62: 88th Ave & Old Hwy 99													
62											64		
24 s											26 s		
06											08		
24 s											26 s		

HCM 2010 Signalized Intersection Summary

Existing 2015
PM Peak Hour

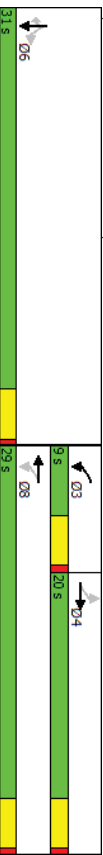
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖
Traffic Volume (veh/h)	0	670	175	5	270	0	180	5	25	2	5	1
Future Volume (veh/h)	0	670	175	5	270	0	180	5	25	2	5	1
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Q ₀), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped Bike Adj(A _{pb})	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/hln	1863	1881	1881	1881	1881	1845	1847	1900	1900	1863	1900	1900
Adj Flow Rate, veh/h	0	744	194	6	300	0	200	5	28	2	5	1
Adj No of Lanes	1	1	1	1	1	0	1	0	0	0	1	0
Peak Hour Factor	0.92	0.90	0.90	0.90	0.92	0.90	0.92	0.90	0.92	0.92	0.92	0.92
Percent Heavy Veh. %	2	1	1	1	1	3	2	2	2	2	2	2
Cap. veh/h	155	1131	961	359	1131	0	412	45	251	136	243	40
Arrive On Green	0.00	0.60	0.60	0.60	0.60	0.00	0.18	0.18	0.18	0.18	0.18	0.18
Sat Flow, veh/h	1075	1881	1599	601	1881	0	1391	243	1363	211	1319	219
Gp Volume(V), veh/h	0	744	194	6	300	0	200	0	33	8	0	0
Gp Sat Flow(s), veh/hln	1075	1881	1599	601	1881	0	1391	0	1607	1748	0	0
Q Serve(s), s	0.0	12.2	2.6	0.3	3.5	0.0	6.2	0.0	0.8	0.0	0.0	0.0
Cycle Q Clear(g.c), s	0.0	12.2	2.6	12.5	3.5	0.0	6.3	0.0	0.8	0.2	0.0	0.0
Prop In Lane	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.85	0.25	0.0	0.12	0.0
Lane Gp Cap(c), veh/h	155	1131	961	359	1131	0	412	0	296	419	0	0.00
W/C Ratio(X)	0.00	0.66	0.20	0.02	0.27	0.00	0.49	0.00	0.11	0.02	0.00	0.00
Avail Cap(c), veh/h	155	1131	961	359	1131	0	813	0	759	901	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(f)	0.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	6.1	4.2	10.2	4.4	0.0	18.1	0.0	15.8	15.6	0.0	0.0
Incr Delay (d ₂), s/veh	0.0	3.0	0.5	0.1	0.6	0.0	0.9	0.0	0.2	0.0	0.0	0.0
Initial Q Delay(d ₀), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackQ(50%), veh/h	0.0	7.1	1.3	0.1	1.9	0.0	2.5	0.0	0.4	0.1	0.0	0.0
Lngrp Delay(d ₀), s/veh	0.0	9.1	4.7	10.3	5.0	0.0	18.9	0.0	16.0	15.6	0.0	0.0
Lngrp LOS	A	A	A	B	A	B	B	B	B	B	B	B
Approach Vol, veh/h	938	306	233	8								
Approach Delay, s/veh	8.2	5.1	18.5	15.6								
Approach LOS	A	A	B	B								
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	2	4	6	8								
Phs Duration (G+Y+R ₀), s	34.0	12.6	34.0	12.6								
Change Period (Y+R ₀), s	6.0	4.0	6.0	4.0								
Max Green Setting (G _{max}), s	28.0	22.0	28.0	22.0								
Max Q Clear Time (Q _{ch1}), s	14.5	8.3	14.2	2.2								
Green Ext Time (Q _{ch}), s	5.8	0.6	5.9	0.7								
Intersection Summary												
HCM 2010 Crt Delay	9.2											
HCM 2010 LOS	A											

Lanes, Volumes, Timings

Existing 2015
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖
Traffic Volume (vph)	0	295	30	145	125	0	0	0	0	500	0	285
Future Volume (vph)	0	295	30	145	125	0	0	0	0	500	0	285
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0	150	0	0	0	0	0	0	0	300
Storage Lanes	0	0	0	1	0	0	0	0	0	0	0	1
Taper Length (ft)	25	0	0	25	0	0	25	0	0	25	0	0
Right Turn on Red	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Link Speed (mph)	30	30	30	30	30	30	30	30	30	30	30	30
Link Distance (ft)	1124	1124	1124	926	926	1099	1099	1099	1099	1644	1644	1644
Travel Time (s)	25.5	25.5	25.5	16.0	16.0	25.0	25.0	25.0	25.0	37.4	37.4	37.4
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 (%)	1%	1%	1%	9%	9%	9%	0%	0%	0%	4%	4%	4%
Shared Lane Traffic (%)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Turn Type	pm+pt	pm+pt	pm+pt	pm+pt	pm+pt	pm+pt	pm+pt	pm+pt	pm+pt	pm+pt	pm+pt	pm+pt
Protected Phases	4	4	4	3	8	8	8	8	8	6	6	6
Permitted Phases	4	4	4	3	8	8	8	8	8	6	6	6
Detector Phase	4	4	4	3	8	8	8	8	8	6	6	6
Switch Phase	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Initial (s)	200	200	200	80	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Minimum Spill (s)	200	200	200	90	29.0	29.0	29.0	29.0	29.0	31.0	31.0	31.0
Total Split (s)	33.3%	33.3%	33.3%	15.0%	48.3%	48.3%	51.7%	51.7%	51.7%	3.5	3.5	3.5
Total Split (%)	3.5	3.5	3.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
All-Red Time (s)	0.5	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
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	4.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lead	Lead	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	None	None	None	None	None
Intersection Summary												
Area Type:	Other	Other	Other	Other	Other	Other	Other	Other	Other	Other	Other	Other
Cycle Length: 60												
Actuated Cycle Length: 56.6												
Natural Cycle: 60												
Control Type: Actuated-Uncoordinated												

Splits and Phases: 63:1-5 SB Ramps & 93rd Ave



HCM 2010 Signalized Intersection Summary

Existing 2015
PM Peak Hour

63: I-5 SB Ramps & 93rd Ave

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	295	30	145	125	0	0	0	0	500	0	285
Future Volume (veh/h)	0	295	30	145	125	0	0	0	0	500	0	285
Number	7	4	14	3	8	18	1	6	16			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped Bike Adj(A_pb7)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/hln	1900	1881	1900	1743	1743	0	1900	1827	1827	1900	1827	1827
Adj Flow Rate, veh/h	0	335	34	165	142	0	568	0	131			
Adj No of Lanes	0	1	0	1	1	0	0	1	0	1	0	1
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
Percent Heavy Veh. %	1	1	1	9	9	0	4	4	4	4	4	4
Cap. veh/h	0	402	41	315	689	0	812	0	725			
Arrive On Green	0.00	0.24	0.09	0.40	0.00	0.00	0.47	0.00	0.47			
Sat Flow, veh/h	0	1681	171	1660	1743	0	1740	0	1553			
Grp Volume(V), veh/h	0	369	165	142	0	568	0	131				
Grp Sat Flow(s), veh/hln	0	0	1851	1660	1743	0	1740	0	1553			
Q Serve(s), s	0.0	0.0	11.0	4.1	3.1	0.0	15.0	0.0	2.8			
Cycle Q Clear(g,c), s	0.0	0.0	11.0	4.1	3.1	0.0	15.0	0.0	2.8			
Prop In Lane	0.00	0.09	1.00	1.00	0.00	1.00	1.00	0.00	1.00			
Lane Grp Cap(c), veh/h	0	443	315	689	0	812	0	725				
V/C Ratio(X)	0.00	0.00	0.83	0.52	0.21	0.00	0.70	0.00	0.18			
Avail Cap(c, a), veh/h	0	512	315	753	0	812	0	725				
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(f)	0.00	0.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	0.0	0.0	20.9	14.9	11.5	0.0	12.2	0.0	9.0			
Incr Delay (d2), s/veh	0.0	0.0	10.0	1.6	0.1	0.0	5.0	0.0	0.5			
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackQ(50%), veh/h	0.0	0.0	6.8	2.0	1.5	0.0	8.2	0.0	1.3			
LnGrp Delay(d), s/veh	0.0	0.0	30.9	16.5	11.7	0.0	17.2	0.0	9.5			
LnGrp LOS			C	B	B		B		A			
Approach Vol, veh/h	369			307			699					
Approach Delay, s/veh	30.9			14.3			15.8					
Approach LOS	C			B			B					
Timer	1	2	3	4	5	6	7	8				
Assigned Phs												
Phs Duration (G+Y+Rd), s		9.0	17.9			31.0		26.9				
Change Period (Y+Rd), s		4.0	4.0			4.0		4.0				
Max Green Setting (Gmax), s		5.0	16.0			27.0		25.0				
Max Q Clear Time (Q_c+H1), s		6.1	13.0			17.0		5.1				
Green Ext Time (Q_c), s		0.0	0.9			3.1		3.0				
Intersection Summary												
HCM 2010 Crt Delay				19.5								
HCM 2010 LOS				B								

HCM 2010 TWSC

Existing 2015
PM Peak Hour

64: I-5 NB Ramps & 93rd Ave

Intersection	2.6											
Int Delay, s/veh												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	245	505	0	0	250	340	45	0	115	0	0	0
Future Vol, veh/h	245	505	0	0	250	340	45	0	115	0	0	0
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	-	-	Yield	-	-	Yield	-	-	None
Storage Length	125	-	-	-	-	300	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	-	-
Grade, %	-	-	-	-	-	-	-	-	-	-	-	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	3	3	3	8	8	8	14	14	14	14	14	14
Mvmt Flow	261	537	0	0	266	362	48	0	122	0	0	0

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	266	0	-	0
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.13	-	-	-
Critical Hdwy Sig 1	-	-	-	-
Critical Hdwy Sig 2	-	-	-	-
Follow-up Hdwy	2.227	-	-	-
Pot Cap-1 Maneuver	1292	0	-	-
Stage 1	-	0	-	-
Stage 2	-	0	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	1292	-	-	-
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Approach	EB	WB	NB	
HCM Control Delay, s	2.8	0	11.5	
HCM LOS			B	
Minor Lane/Minor Mvmt	NBLn1	EBL	EBT	WBT
Capacity (veh/h)	725	1292	-	-
HCM Lane V/C Ratio	0.235	0.202	-	-
HCM Control Delay (s)	11.5	8.5	-	-
HCM Lane LOS	B	A	-	-
HCM 95th %ile Q(veh)	0.9	0.8	-	-

HCM 2010 TWSC
65: Kimmie St & 93rd Ave

Existing 2015
PM Peak Hour

Intersection													
Int Delay, s/veh		1.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Traffic Vol, veh/h	25	460	15	5	410	5	15	1	10	5	5	50	
Future Vol, veh/h	25	460	15	5	410	5	15	1	10	5	5	50	
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None	
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-	
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-	
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-	
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94	
Heavy Vehicles, %	4	4	4	1	1	1	0	0	0	5	5	5	
Wmtl Flow	27	489	16	5	436	5	16	1	11	5	5	53	
Major/Minor													
Conflicting Flow All	441	0	0	505	0	0	1030	1003	497	1005	1008	439	
Stage 1	-	-	-	-	-	-	551	551	-	449	449	-	
Stage 2	-	-	-	-	-	-	479	452	-	556	559	-	
Critical Hdwy	4.14	-	-	4.11	-	-	7.1	6.5	6.2	7.15	6.55	6.25	
Critical Hdwy Sig 1	-	-	-	-	-	-	6.1	5.5	-	6.15	5.55	-	
Critical Hdwy Sig 2	-	-	-	-	-	-	6.1	5.5	-	6.15	5.55	-	
Follow-up Hdwy	2.236	-	-	2.209	-	-	3.5	4	3.3	3.545	4.045	3.345	
Poi Cap-1 Maneuver	1108	-	-	1065	-	-	214	244	577	217	238	612	
Stage 1	-	-	-	-	-	-	522	519	-	584	567	-	
Stage 2	-	-	-	-	-	-	571	574	-	510	506	-	
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-	
Mov Cap-1 Maneuver	1108	-	-	1065	-	-	186	234	577	206	229	612	
Mov Cap-2 Maneuver	-	-	-	-	-	-	186	234	-	206	229	-	
Stage 1	-	-	-	-	-	-	504	501	-	564	564	-	
Stage 2	-	-	-	-	-	-	513	571	-	483	489	-	
Approach													
EB	WB					NB					SB		
HCM Control Delay, s	0.4					0.1					20.9		
HCM LOS						C					B		
Minor Lane/Major Wmtl													
NBLnT	EBL	EBT	EBR	WBL	WBT	WBR	SBLnT						
Capacity (veh/h)	294	1108	-	1065	-	-	469						
HCM Lane V/C Ratio	0.109	0.024	-	0.005	-	-	0.136						
HCM Control Delay (s)	20.9	8.3	0	8.4	0	-	13.9						
HCM Lane LOS	C	A	A	A	A	A	B						
HCM 95th %tile Q(veh)	0.4	0.1	-	0	-	-	0.5						

HCM 2010 AWSC
66: Case Rd & 93rd Ave

Existing 2015
PM Peak Hour

Intersection														
Intersection Delay, s/veh		20.3												
Intersection LOS		C												
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NEU	NEL	NET	NER	NEL	
Traffic Vol, veh/h	0	2	315	165	0	55	295	30	0	80	20	30	30	
Future Vol, veh/h	0	2	315	165	0	55	295	30	0	80	20	30	30	
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	0.92	
Heavy Vehicles, %	2	3	3	3	2	2	2	2	2	0	0	0	0	
Mmtl Flow	0	2	342	179	0	60	321	33	0	87	22	33	33	
Number of Lanes	0	0	1	0	0	0	1	1	0	0	1	0	0	
Approach	EB						WB							
Opposing Approach	WB						WB							
Opposing Lanes	2						1							
Conflicting Approach Left	SW						NE							
Conflicting Lanes Left	1						1							
Conflicting Approach Right	NE						SW							
Conflicting Lanes Right	1						1							
HCM Control Delay	25.4						18.8							
HCM LOS	D						C							
Lane	NELnT	EBLnT	WBLnT	WBLn2	SWLnT									
Vol Left, %	62%	0%	16%	0%	50%									
Vol Thru, %	15%	65%	84%	0%	50%									
Vol Right, %	23%	34%	0%	100%	1%									
Sign Control	Stop	Stop	Stop	Stop	Stop									
Traffic Vol by Lane	130	482	350	30	101									
LT Vol	80	2	55	0	50									
Through Vol	20	315	295	0	50									
RT Vol	30	165	0	30	1									
Lane Flow Rate	141	524	380	33	110									
Geometry Grip	2	5	7	7	2									
Degree of Util (X)	0.266	0.784	0.648	0.048	0.213									
Departure Headway (Hd)	6.769	5.388	6.132	5.341	7									
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes									
Cap	534	665	582	663	515									
Service Time	4.775	3.476	3.926	3.134	5.008									
HCM Lane V/C Ratio	0.264	0.788	0.653	0.05	0.214									
HCM Control Delay	12.2	25.4	19.7	8.4	11.9									
HCM Lane LOS	B	D	C	A	B									
HCM 95th-ile Q	1.1	7.6	4.7	0.2	0.8									

HCM 2010 AWSC
66: Case Rd & 93rd Ave

Existing 2015
PM Peak Hour

Intersection				
Intersection Delay, s/vch				
Intersection LOS				
Movement	SMU	SWL	SWT	SWR
Traffic Vol, veh/h	0	50	50	1
Future Vol, veh/h	0	50	50	1
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	1	1	1
Mvmt Flow	0	54	54	1
Number of Lanes	0	0	1	0
Approach				
Opposing Approach	SW			
Opposing Lanes	NE			
Conflicting Approach Left	WB			
Conflicting Lanes Left	2			
Conflicting Approach Right	EB			
Conflicting Lanes Right	1			
HCM Control Delay	11.9			
HCM LOS	B			

HCM 2010 AWSC
67: Tilley Rd (South) & 93rd Ave

Existing 2015
PM Peak Hour

Intersection										
Intersection Delay, s/vch										
Intersection LOS										
		B								
Movement	EBU	EBT	EBR	WBU	WBL	WBT	NBU	NBL	NBR	
Traffic Vol, veh/h	0	240	155	0	85	235	0	130	65	
Future Vol, veh/h	0	240	155	0	85	235	0	130	65	
Peak Hour Factor	0.92	0.87	0.87	0.92	0.87	0.87	0.92	0.87	0.87	
Heavy Vehicles, %	2	3	3	2	2	2	2	1	1	
Mvmt Flow	0	276	178	0	98	270	0	149	75	
Number of Lanes	0	1	0	0	0	1	0	1	0	
Approach										
Opposing Approach	EB		WB							
Opposing Lanes	WB		EB							
Conflicting Approach Left	1		1							
Conflicting Lanes Left	0		NB							
Conflicting Approach Right	NB		1							
Conflicting Lanes Right	1		0							
HCM Control Delay	15.8		14.4							
HCM LOS	C		B							

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	67%	0%	27%
Vol Thru, %	0%	61%	73%
Vol Right, %	33%	39%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	195	395	320
LT Vol	130	0	85
Through Vol	0	240	235
RT Vol	65	155	0
Lane Flow Rate	224	454	368
Geometry Grp	1	1	1
Degree of Util (X)	0.364	0.622	0.54
Departure Headway (Hd)	5.849	4.933	5.287
Convergence, Y/N	Yes	Yes	Yes
Cap	614	731	680
Service Time	3.889	2.965	3.321
HCM Lane V/C Ratio	0.365	0.621	0.541
HCM Control Delay	12.2	15.8	14.4
HCM Lane LOS	B	C	B
HCM 95th-ile Q	1.7	4.4	3.3

HCM 2010 TWSC
68: 93rd Ave & Tilley Rd (North)

Existing 2015
PM Peak Hour

Intersection									
Int Delay, s/veh		5.2							
Movement	EBL	EBT	WBT	WBR	SBL	SBR			
Traffic Vol, veh/h	115	190	95	10	15	225			
Future Vol, veh/h	115	190	95	10	15	225			
Conflicting Peds, #/hr	0	0	0	0	0	0			
Sign Control	Free	Free	Free	Free	Stop	Stop			
RT Channelized	-	None	-	None	-	None			
Storage Length	-	-	-	-	250	0			
Vehicle in Median Storage, #	-	0	0	0	0	-			
Grade, %	-	0	-	0	-	0			
Peak Hour Factor	86	86	86	86	86	86			
Heavy Vehicles, %	2	2	3	3	1	1			
Wmtl Flow	134	221	110	12	17	262			

Major/Minor	Major1	Major2	Minor2						
Conflicting Flow All	122	0	0	604	116				
Stage 1	-	-	-	116	-				
Stage 2	-	-	-	488	-				
Critical Hdwy	4.12	-	-	6.41	6.21				
Critical Hdwy Sig 1	-	-	-	5.41	-				
Critical Hdwy Sig 2	-	-	-	5.41	-				
Follow-up Hdwy	2.218	-	-	3.509	3.309				
Pot Cap-1 Maneuver	1465	-	-	463	939				
Stage 1	-	-	-	911	-				
Stage 2	-	-	-	619	-				
Platoon blocked, %	-	-	-	-	-				
Mov Cap-1 Maneuver	1465	-	-	415	939				
Mov Cap-2 Maneuver	-	-	-	415	-				
Stage 1	-	-	-	911	-				
Stage 2	-	-	-	555	-				

Approach	EB	WB	SB			
HCM Control Delay, s	2.9	0	10.5			
HCM LOS			B			
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBL	SBR
Capacity (veh/h)	1465	-	-	415	939	-
HCM Lane V/C Ratio	0.091	-	-	0.042	0.279	-
HCM Control Delay (s)	7.7	0	-	14.1	10.3	-
HCM Lane LOS	A	A	-	B	B	-
HCM 95th %ile Q(veh)	0.3	-	-	0.1	1.1	-

HCM 2010 TWSC
69: 93rd Ave & Old Hwy 99

Existing 2015
PM Peak Hour

Intersection						
Int Delay, s/veh		3.2				
Movement	EBT	EBR	WBL	WBT	NEL	NER
Traffic Vol, veh/h	630	30	70	215	15	155
Future Vol, veh/h	630	30	70	215	15	155
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	450	300	-	300	0
Vehicle in Median Storage, #	0	-	-	0	-	2
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	1	1	2	2	1	1
Wmtl Flow	685	33	76	234	16	168

Major/Minor	Major1	Major2	Minor1						
Conflicting Flow All	0	0	685	0	1071	685			
Stage 1	-	-	-	-	685	-			
Stage 2	-	-	-	-	386	-			
Critical Hdwy	-	-	4.12	-	6.41	6.21			
Critical Hdwy Sig 1	-	-	-	-	5.41	-			
Critical Hdwy Sig 2	-	-	-	-	5.41	-			
Follow-up Hdwy	-	-	2.218	-	3.509	3.309			
Pot Cap-1 Maneuver	-	-	908	-	246	450			
Stage 1	-	-	-	-	502	-			
Stage 2	-	-	-	-	689	-			
Platoon blocked, %	-	-	-	-	-	-			
Mov Cap-1 Maneuver	-	-	908	-	225	450			
Mov Cap-2 Maneuver	-	-	-	-	419	-			
Stage 1	-	-	-	-	502	-			
Stage 2	-	-	-	-	631	-			

Approach	EB	WB	NE			
HCM Control Delay, s	0	2.3	17.4			
HCM LOS			C			
Minor Lane/Major Wmtl	NEL1/NEL2	EBT	EBR	WBL	WBT	
Capacity (veh/h)	419	450	-	-	908	-
HCM Lane V/C Ratio	0.039	0.374	-	-	0.084	-
HCM Control Delay (s)	13.9	17.7	-	-	9.3	-
HCM Lane LOS	B	C	-	-	A	-
HCM 95th %tile Q(veh)	0.1	1.7	-	-	0.3	-

HCM 2010 AWSC
1: RW Johnson Rd & Mottman Rd

Projected 2040 No Build
PM Peak Hour

Intersection													
Intersection Delay, s/veh		17.4											
Intersection LOS		C											
Movement													
	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	
Traffic Vol, veh/h	0	55	100	10	0	165	55	125	0	5	240	140	
Future Vol, veh/h	0	55	100	10	0	165	55	125	0	5	240	140	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Heavy Vehicles, %	2	6	6	6	2	9	9	9	2	4	4	4	
Mgmt Flow	0	58	105	11	0	174	58	132	0	5	253	147	
Number of Lanes	0	1	1	0	0	1	1	1	0	1	1	0	
Approach													
Opposing Approach	EB			WB			NB						
Opposing Lanes	WB			EB			SB						
Conflicting Approach Left	2			2			2						
Conflicting Lanes Left	SB			NB			EB						
Conflicting Approach Right	2			2			2						
Conflicting Lanes Right	NB			SB			WB						
Conflicting Lanes Right	2			2			2						
HCM Control Delay	12.4			14			25.1						
HCM LOS	B			B			D						
Lane													
	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2					
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%					
Vol Thru, %	0%	63%	0%	91%	0%	31%	0%	86%					
Vol Right, %	0%	37%	0%	0%	0%	69%	0%	14%					
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop					
Traffic Vol by Lane	5	380	55	110	165	180	50	180					
LT Vol	5	0	55	0	165	0	50	0					
Through Vol	0	240	0	100	0	55	0	155					
RT Vol	0	140	0	10	0	125	0	25					
Lane Flow Rate	5	400	58	116	174	189	53	189					
Geometry Grp	7	7	7	7	7	7	7	7					
Degree of Util (X)	0.011	0.732	0.13	0.241	0.372	0.353	0.112	0.372					
Departure Headway (Hd)	7.36	6.588	8.061	7.482	7.712	6.704	7.671	7.059					
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes					
Cap	486	548	445	479	467	536	467	510					
Service Time	5.101	4.328	5.813	5.234	5.459	4.45	5.419	4.807					
HCM Lane V/C Ratio	0.01	0.73	0.13	0.242	0.373	0.353	0.113	0.371					
HCM Control Delay	10.2	25.3	12	12.6	15	13.1	11.4	14					
HCM Lane LOS	B	D	B	B	B	B	B	B					
HCM 95th-ile Q	0	6.1	0.4	0.9	1.7	1.6	0.4	1.7					

HCM 2010 AWSC
1: RW Johnson Rd & Mottman Rd

Projected 2040 No Build
PM Peak Hour

Intersection					
Intersection Delay, s/veh					
Intersection LOS					
Movement					
	SBU	SBL	SBT	SBR	
Traffic Vol, veh/h	0	50	155	25	
Future Vol, veh/h	0	50	155	25	
Peak Hour Factor	0.95	0.95	0.95	0.95	
Heavy Vehicles, %	2	3	3	3	
Wmnt Flow	0	53	163	26	
Number of Lanes	0	1	1	0	
Approach					
	SB				
Opposing Approach	NB				
Opposing Lanes	2				
Conflicting Approach Left	WB				
Conflicting Lanes Left	2				
Conflicting Approach Right	EB				
Conflicting Lanes Right	2				
HCM Control Delay	13.4				
HCM LOS	B				
Lane					

Lanes, Volumes, Timings

2: Crosby Blvd & Mottman Rd

Projected 2040 No Build
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	205	230	35	5	30	125	45	665	120	190	850	535
Future Volume (vph)	205	230	35	5	30	125	45	665	120	190	850	535
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200	0	0	0	0	200	0	200	0	100	0	0
Storage Lanes	1	0	0	0	0	1	0	1	0	1	0	0
Taper Length (ft)	25	0	0	0	0	25	0	25	0	25	0	0
Right Turn on Red	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Link Speed (mph)	30	30	30	30	30	30	30	30	30	30	30	30
Link Distance (ft)	940	940	1116	1116	1116	1116	1116	1116	1116	1116	1116	1116
Travel Time (s)	21.4	21.4	25.4	25.4	25.4	25.4	25.4	25.4	25.4	25.4	25.4	25.4
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	3%	3%	3%	0%	0%	0%	1%	1%	1%	3%	3%	3%
Shared Lane Traffic (%)	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	4	4	8	8	8	8	2	2	2	6	6	6
Permitted Phases	4	4	8	8	8	8	2	2	2	6	6	6
Detector Phase	4	4	8	8	8	8	2	2	2	6	6	6
Switch Phase	4	4	8	8	8	8	2	2	2	6	6	6
Minimum Inhibit (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Spill (s)	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5
Total Spill (s)	39.0	39.0	39.0	39.0	39.0	39.0	61.0	61.0	61.0	61.0	61.0	61.0
Total Spill (%)	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	61.0%	61.0%	61.0%	61.0%	61.0%	61.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
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	4.5
Lead/Lag	Lead/Lag Optimize?	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Intersection Summary												
Area Type:	Other											
Cycle Length:	100											
Actuated Cycle Length:	100											
Offset:	82 (82%), Referenced to phase 2,NBTL and 6,SBTL, Start of Yellow											
Natural Cycle:	60											
Control Type:	Actuated Coordinated											
Spills and Phases:	2: Crosby Blvd & Mottman Rd											
61s	62(R)	39s	04	08	39s	04	08	39s	04	08	39s	04
06(R)	06(R)	39s	04	08	39s	04	08	39s	04	08	39s	04

HCM 2010 Signalized Intersection Summary

2: Crosby Blvd & Mottman Rd

Projected 2040 No Build
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (veh/h)	205	230	35	5	30	125	45	665	120	190	850	535
Future Volume (veh/h)	205	230	35	5	30	125	45	665	120	190	850	535
Ideal Flow Rate (veh/h)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Q ₀) veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped Bike Adj (Adj _{pb})	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/hln	1845	1845	1900	1900	1900	1900	1881	1881	1845	1845	1900	1900
Adj Flow Rate, veh/h	216	242	37	5	32	132	47	700	126	200	895	0
Adj No. of Lanes	1	1	0	0	1	0	1	1	1	1	2	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh. %	3	3	3	0	0	0	1	1	1	3	3	3
Cap. veh/h	337	388	59	41	87	322	413	1245	1058	374	2319	0
Arrive On Green	0.25	0.25	0.25	0.25	0.25	0.25	0.66	0.66	0.66	0.66	0.66	0.00
Sat Flow, veh/h	1205	1563	239	15	349	1297	625	1881	1599	654	3597	0
Gp Volume(v), veh/h	216	0	279	169	0	0	47	700	126	200	895	0
Gp Sat Flow(s), veh/hln	1205	0	1802	1661	0	0	625	1881	1599	654	1752	0
Q Serve(g.s), s	11.4	0.0	13.8	0.0	0.0	0.0	3.7	20.1	2.9	23.7	11.6	0.0
Cycle Q Clear(g.c), s	19.9	0.0	13.8	8.5	0.0	0.0	15.3	20.1	2.9	43.8	11.6	0.0
Prop In Lane	1.00	0.03	0.13	0.03	0.78	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Lane Gp Cap(c), veh/h	337	0	448	450	0	0	413	1245	1058	374	2319	0.00
V/C Ratio(X)	0.64	0.00	0.62	0.38	0.00	0.00	0.11	0.56	0.12	0.54	0.39	0.00
Avail Cap(C-a), veh/h	454	0	622	608	0	0	413	1245	1058	374	2319	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Filler(f)	1.00	0.00	1.00	1.00	0.00	0.00	0.89	0.89	0.89	1.00	1.00	0.00
Uniform Delay (d), s/veh	36.6	0.0	33.4	31.4	0.0	0.0	11.2	9.1	6.2	20.9	7.7	0.0
Incr Delay (d2), s/veh	2.0	0.0	1.4	0.5	0.0	0.0	0.5	1.6	0.2	5.4	0.5	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackQ(50%),veh/h	5.8	0.0	7.0	4.0	0.0	0.0	0.7	10.9	1.3	4.8	5.8	0.0
LnGrp Delay(d), s/veh	38.7	0.0	34.8	31.9	0.0	0.0	11.7	10.8	6.4	26.3	8.2	0.0
LnGrp LOS	D		C	C			B	B	A	C	A	
Approach Vol, veh/h	495											
Approach Delay, s/veh	36.5											
Approach LOS	D											
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	2	2	4	4	6	6	8					
Phs Duration (G+Y+Rc), s	70.7	29.3	29.3	70.7	70.7	29.3	29.3					
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5					
Max Green Setting (Gmax), s	56.5	34.5	34.5	56.5	56.5	34.5	34.5					
Max Q Clear Time (Q-clear), s	22.1	21.9	21.9	45.8	45.8	22.1	10.5					
Green Ext Time (P.C.), s	19.7	3.0	8.4				3.7					
Intersection Summary												
HCM 2010 Cnt Delay	17.1											
HCM 2010 LOS	B											

Lanes, Volumes, Timings

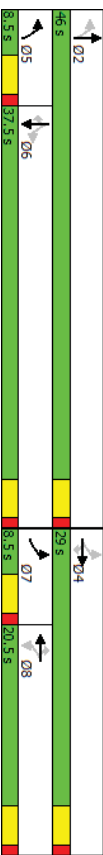
3: Crosby Blvd & Irving St

Projected 2040 No Build
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	75	50	45	40	45	220	35	505	25	150	660	100
Future Volume (vph)	75	50	45	40	45	220	35	505	25	150	660	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	250
Storage Length (ft)	0	0	200	0	0	150	200	0	0	1	250	1
Storage Lanes	0	1	0	0	1	1	1	0	1	1	1	1
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes		Yes			Yes	
Link Speed (mph)	30			30			30			30		
Link Distance (ft)	468			2725			1710			645		
Travel Time (s)	10.6			61.9			38.9			14.7		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	8%	8%	8%	1%	1%	1%	1%	1%	1%	2%	2%	2%
Shared Lane Traffic (%)												
Turn Type	pm+pl	NA	Perm	Perm	NA	pm+pl	NA	Perm	NA	Perm	NA	Perm
Protected Phases	7	4		8	8		5	2		6	6	6
Permitted Phases	4			4	8		8	2		6	6	6
Detector Phase	7	4	4	4	8	8	8	5	2	6	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Spill (s)	8.5	20.5	20.5	20.5	20.5	20.5	8.5	20.5	20.5	20.5	20.5	20.5
Total Split (s)	8.5	29.0	29.0	20.5	20.5	20.5	8.5	46.0	37.5	37.5	37.5	37.5
Total Split (%)	11.3%	38.7%	38.7%	27.3%	27.3%	27.3%	11.3%	61.3%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
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	4.5
Lead/Lag	Lead			Lag	Lag	Lag	Lead			Lag	Lag	Lag
Lead-Lag Optimizer?	Yes			Yes	Yes	Yes	Yes			Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Max		Max	Max	Max

Area Type:	Other
Cycle Length:	75
Actuated Cycle Length:	63.8
Natural Cycle:	75
Control Type:	Actuated-Uncoordinated

Splits and Phases: 3 Crosby Blvd & Irving St



HCM 2010 Signalized Intersection Summary

3: Crosby Blvd & Irving St

Projected 2040 No Build
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	75	50	45	40	45	220	35	505	25	150	660	100
Future Volume (veh/h)	75	50	45	40	45	220	35	505	25	150	660	100
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Q ₀) veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped Bike Adj (Adj _{pb})	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/hln	1900	1759	1759	1900	1881	1881	1881	1900	1863	1863	1863	1863
Adj Flow Rate, veh/h	79	53	47	42	47	232	37	532	26	158	695	0
Adj No of Lanes	0	1	1	0	1	1	1	1	0	1	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh. %	8	8	8	1	1	1	1	1	1	1	2	2
Cap. veh/h	94	39	282	153	141	301	400	1186	58	561	1051	893
Arrive On Green	0.19	0.19	0.19	0.19	0.19	0.19	0.03	0.67	0.67	0.56	0.56	0.00
Sat Flow, veh/h	9	207	1495	357	750	1599	1792	1779	87	848	1863	1583
Gp Volume(v), veh/h	132	0	47	89	0	232	37	0	558	158	695	0
Gp Sat Flow(s), veh/hln	216	0	1495	1108	0	1599	1792	0	1866	848	1863	1583
Q Serve(g.s), s	6.0	0.0	1.6	0.6	0.0	8.6	0.5	0.0	8.8	6.8	16.1	0.0
Cycle Q Clear(g.c), s	6.0	0.0	1.6	0.6	0.0	8.6	0.5	0.0	8.8	9.2	16.1	0.0
Prop In Lane	0.60	1.00	0.47	1.00	0.47	1.00	1.00	0.05	1.00	1.00	1.00	1.00
Lane Gp Cap(c), veh/h	0	0	282	294	0	301	400	0	1244	561	1051	893
AVC Ratio(X)	0.00	0.00	0.17	0.30	0.00	0.77	0.09	0.00	0.45	0.28	0.66	0.00
Avail Cap(C, a), veh/h	0	0	589	401	0	411	461	0	1244	561	1051	893
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(f)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	21.2	22.1	0.0	24.0	7.2	0.0	4.9	8.6	9.4	0.0
Incrr Delay (d2), s/veh	0.0	0.0	0.3	0.6	0.0	6.0	0.1	0.0	1.2	1.3	3.3	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackQ(50%), veh/h	0.0	0.0	0.7	1.5	0.0	4.2	0.2	0.0	4.9	1.8	9.1	0.0
LnGrp Delay(d), s/veh	0.0	0.0	21.4	22.6	0.0	29.9	7.3	0.0	6.1	9.9	12.7	0.0
LnGrp LOS			C	C		C	A		A	A	B	
Approach Vol, veh/h	179			321			595			883		
Approach Delay, s/veh	5.6			27.9			6.2			12.2		
Approach LOS	A			C			A			B		
Timer	1	2	3	4	5	6	7	8				
Assigned Pts	4	2		4	5	6		8				
Pts Duration (G+Y+Rc), s	46.0			16.2	6.4	39.6		16.2				
Change Period (Y+Rc), s	4.5			4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	41.5			24.5	4.0	33.0		16.0				
Max Q Clear Time (Q _c +t1), s	10.8			8.0	2.5	18.1		10.6				
Green Ext Time (P _c), s	12.1			2.1	0.0	8.3		1.2				

HCM 2010 AWSC
4: Irving St & 7th Ave

Projected 2040 No Build
PM Peak Hour

Intersection													
Intersection Delay, s/vch													
Intersection LOS													
A													
Movement													
Traffic Vol, veh/h	0	5	15	235	0	1	25	1	0	245	5	1	
Future Vol, veh/h	0	5	15	235	0	1	25	1	0	245	5	1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Heavy Vehicles, %	2	1	1	1	2	0	0	0	2	1	1	1	
Wmnt Flow	0	5	16	247	0	1	26	1	0	258	5	1	
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0	
Approach													
EB													
Opposing Approach	WB					WB				NB			
Opposing Lanes	1					EB				SB			
Conflicting Approach Left	SB					NB				EB			
Conflicting Lanes Left	1					1				1			
Conflicting Approach Right	NB					SB				WB			
Conflicting Lanes Right	1					1				1			
HCM Control Delay	8.9					8.1				10.3			
HCM LOS	A					A				B			
Lane													
NB,LT EBL,LT WBL,LT SBL,LT													
Vol Left, %	98%	2%	2%	4%	0%								
Vol Thru, %	2%	6%	93%	50%									
Vol Right, %	0%	92%	4%	50%									
Sign Control	Stop	Stop	Stop	Stop									
Traffic Vol by Lane	251	255	27	10									
LT Vol	245	5	1	0									
Through Vol	5	15	25	5									
RT Vol	1	235	1	5									
Lane Flow Rate	264	268	28	11									
Geometry C/P	1	1	1	1									
Degree of Util(X)	0.349	0.305	0.038	0.013									
Departure Headway (Hd)	4.752	4.069	4.859	4.56									
Convergence, Y/N	Yes	Yes	Yes	Yes									
Cap	756	880	736	781									
Service Time	2.788	2.109	2.895	2.608									
HCM Lane V/C Ratio	0.349	0.305	0.038	0.014									
HCM Control Delay	10.3	8.9	8.1	7.7									
HCM Lane LOS	B	A	A	A									
HCM 95th-ile Q	1.6	1.3	0.1	0									

HCM 2010 AWSC
4: Irving St & 7th Ave

Projected 2040 No Build
PM Peak Hour

Intersection													
Intersection Delay, s/vch													
Intersection LOS													
Movement													
Traffic Vol, veh/h	0	0	0	5	5								
Future Vol, veh/h	0	0	0	5	5								
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95								
Heavy Vehicles, %	2	0	0	0	0								
Wmnt Flow	0	0	0	5	5								
Number of Lanes	0	0	0	1	0								
Approach													
SB													
Opposing Approach				NB									
Opposing Lanes				1									
Conflicting Approach Left				WB									
Conflicting Lanes Left				1									
Conflicting Approach Right				EB									
Conflicting Lanes Right				1									
HCM Control Delay				7.7									
HCM LOS				A									
Lane													

HCM 2010 TWSC
5: Crosby Blvd & Barnes Rd

Projected 2040 No Build
PM Peak Hour

Intersection												
Int Delay, s/veh		6.6										
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	10	1	1	10	5	285	1	210	5	345	275	20
Future Vol, veh/h	10	1	1	10	5	285	1	210	5	345	275	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	0	-	-	-	-	175	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	10	10	10	2	2	2	4	4	4	2	2	2
Mvmt Flow	11	1	1	11	5	300	1	221	5	363	289	21

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1254	1254	300	1253	1263	224	311	0	0	226	0	0
Stage 1	1026	1026	-	226	226	-	-	-	-	-	-	-
Stage 2	228	228	-	1027	1037	-	-	-	-	-	-	-
Critical Hdwy	7.2	6.6	6.3	7.12	6.52	6.22	4.14	-	-	4.12	-	-
Critical Hdwy Sig 1	6.2	5.6	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Sig 2	6.2	5.6	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.59	4.09	3.39	3.518	4.018	3.318	2.236	-	-	2.218	-	-
Pot Cap-1 Maneuver	143	166	721	149	170	815	1238	-	-	1342	-	-
Stage 1	214	302	-	777	777	-	-	-	-	-	-	-
Stage 2	757	701	-	283	308	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	69	121	721	117	124	815	1238	-	-	1342	-	-
Mov Cap-2 Maneuver	69	121	-	117	124	-	-	-	-	-	-	-
Stage 1	274	220	-	776	716	-	-	-	-	-	-	-
Stage 2	474	700	-	205	225	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	59.9		13.4		0		4.7	
HCM LOS	F		B					
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBL	EBT	WBL	SBL	SBR
Capacity (veh/h)	1238	-	-	78	119	815	1342	-
HCM Lane V/C Ratio	0.001	-	-	0.162	0.133	0.368	0.271	-
HCM Control Delay (s)	7.9	0	-	59.9	39.8	12	8.7	-
HCM Lane LOS	A	A	-	F	E	B	A	-
HCM 95th %ile Q(veh)	0	-	-	0.5	0.4	1.7	1.1	-

HCM 2010 TWSC
6: Black Lake Belmore Rd & Black Lake Blvd

Projected 2040 No Build
PM Peak Hour

Intersection												
Int Delay, s/veh		111.8										
Movement	EBT	EBR	WBL	WBT	NBL	NBR						
Traffic Vol, veh/h	190	85	250	410	210	230						
Future Vol, veh/h	190	85	250	410	210	230						
Conflicting Peds, #/hr	0	0	0	0	0	0						
Sign Control	Free	Free	Free	Free	Stop	Stop						
RT Channelized	-	None	-	None	-	None						
Storage Length	-	-	250	-	0	-						
Veh in Median Storage, #	0	-	-	0	0	-						
Grade, %	0	-	-	0	-	0						
Peak Hour Factor	95	95	95	95	95	95						
Heavy Vehicles, %	3	3	0	0	1	1						
Mvmt Flow	200	89	263	432	221	242						

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	289	0	1203	245
Stage 1	-	-	-	-	245	-
Stage 2	-	-	-	-	958	-
Critical Hdwy	-	-	4.1	-	6.41	6.21
Critical Hdwy Sig 1	-	-	-	-	5.41	-
Critical Hdwy Sig 2	-	-	-	-	5.41	-
Follow-up Hdwy	-	-	2.2	-	3.509	3.309
Pot Cap-1 Maneuver	-	-	1284	-	~205	796
Stage 1	-	-	-	-	798	-
Stage 2	-	-	-	-	374	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1284	-	~163	796
Mov Cap-2 Maneuver	-	-	-	-	~163	-
Stage 1	-	-	-	-	798	-
Stage 2	-	-	-	-	297	-

Approach	EB		WB		NB	
HCM Control Delay, s	0		3.2		\$ 344.5	
HCM LOS					F	
Minor Lane/Major Mvmt	NBL	NBT	EBL	EBR	WBL	WBT
Capacity (veh/h)	279	-	-	1284	-	-
HCM Lane V/C Ratio	1.66	-	-	0.205	-	-
HCM Control Delay (s)	\$ 344.5	-	-	8.5	-	-
HCM Lane LOS	F	-	-	A	-	-
HCM 95th %ile Q(veh)	29	-	-	0.8	-	-

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

HCM 2010 TWSC
7: RW Johnson Rd & Sapp Rd

Projected 2040 No Build
PM Peak Hour

Intersection													
Int Delay, s/veh		7.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Traffic Vol, veh/h	20	50	5	30	70	110	5	25	20	150	40	50	
Future Vol, veh/h	20	50	5	30	70	110	5	25	20	150	40	50	
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None	
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-	
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-	
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-	
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95	
Heavy Vehicles, %	3	3	3	1	1	1	0	0	0	3	3	3	
Mvmt Flow	21	53	5	32	74	116	5	26	21	158	42	53	

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	189	0	0	58	0
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-
Critical Hdwy	4.13	-	-	4.11	-
Critical Hdwy Sig 1	-	-	-	-	-
Critical Hdwy Sig 2	-	-	-	-	-
Follow-up Hdwy	2.227	-	-	2.209	-
Pot Cap-1 Maneuver	1379	-	-	1553	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	1379	-	-	1553	-
Mov Cap-2 Maneuver	-	-	-	-	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2	1.1	10.8	14.5
HCM LOS			B	B
Minor Lane/Major Mvmt				
Capacity (veh/h)	675	1379	-	631
HCM Lane V/C Ratio	0.078	0.015	-	0.4
HCM Control Delay (s)	10.8	7.7	0	14.5
HCM Lane LOS	B	A	A	B
HCM 95th %ile Q(veh)	0.3	0	-	1.9

HCM 2010 TWSC
8: Sapp Rd & Crosby Blvd

Projected 2040 No Build
PM Peak Hour

Intersection													
Int Delay, s/veh		5.6											
Movement	WBL	WBR	NBT	NBR	SBL	SBT	GBR						
Traffic Vol, veh/h	225	20	230	200	15	205							
Future Vol, veh/h	225	20	230	200	15	205							
Conflicting Peds, #/hr	0	0	0	0	0	0							
Sign Control	Stop	Stop	Free	Free	Free	Free							
RT Channelized	-	None	-	None	-	None							
Storage Length	250	0	-	-	0	-							
Veh in Median Storage, #	0	-	0	-	-	0							
Grade, %	0	-	0	-	-	0							
Peak Hour Factor	95	95	95	95	95	95							
Heavy Vehicles, %	1	1	1	1	0	0							
Mvmt Flow	237	21	242	211	16	216							

Major/Minor	Minor1	Major1	Major2	Minor2	Minor3
Conflicting Flow All	594	347	0	0	453
Stage 1	347	-	-	-	-
Stage 2	247	-	-	-	-
Critical Hdwy	6.41	6.21	-	-	4.1
Critical Hdwy Sig 1	5.41	-	-	-	-
Critical Hdwy Sig 2	5.41	-	-	-	-
Follow-up Hdwy	3.509	3.309	-	-	2.2
Pot Cap-1 Maneuver	469	698	-	-	1118
Stage 1	718	-	-	-	-
Stage 2	796	-	-	-	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	462	698	-	-	1118
Mov Cap-2 Maneuver	462	-	-	-	-
Stage 1	718	-	-	-	-
Stage 2	785	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	19.9	0	0.6
HCM LOS	C		
Minor Lane/Major Mvmt			
Capacity (veh/h)	-	462	698
HCM Lane V/C Ratio	-	0.513	0.014
HCM Control Delay (s)	-	20.7	10.3
HCM Lane LOS	-	C	B
HCM 95th %ile Q(veh)	-	2.9	0.1

9: Black Lake Belmore Rd & 49th Ave Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.1	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3
Total Del/Veh (s)	8.2	9.5	5.0	10.7	12.0	7.2	10.8	11.7	7.4	1.8	2.2	1.2

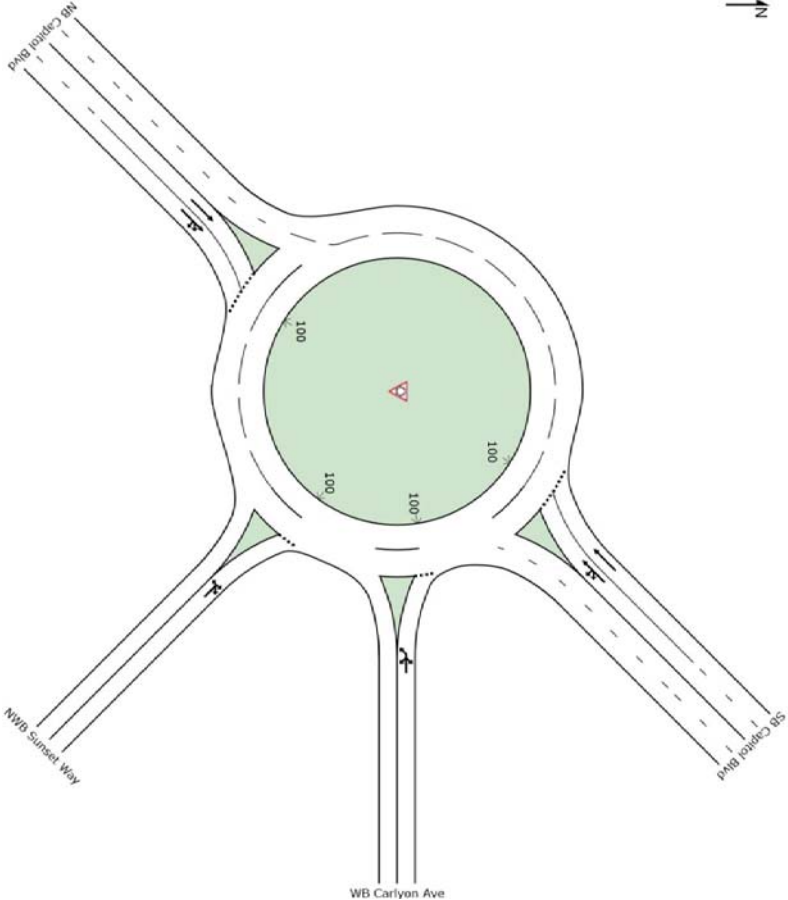
9: Black Lake Belmore Rd & 49th Ave Performance by movement

Movement	All
Denied Del/Veh (s)	0.3
Total Del/Veh (s)	6.7

SITE LAYOUT

Site: 10) Carlyon Ave at Capitol Blvd

Projected 2040 Baseline
PM Peak Hour
Roundabout



MOVEMENT SUMMARY

Site: 10) Carlyon Ave at Capitol Blvd

Projected 2040 Baseline
PM Peak Hour
Roundabout

Movement Performance - Vehicles										
Mov	OD	Demand Flows	Deg.	Average	Level of	95% Back of Queue	Pop.	Effective	Average	
ID	Mov	Total	HV	Satn	Service	Vehicles	Distance	Stop Rate	Speed	
		veh/h	%	v/c	sec	veh	ft	per veh	mph	
Southeast: NWB Sunset Way										
3x	L2	47	2.0	0.130	7.9	LOS A	0.5	12.8	0.65	0.65
18x	R2	21	2.0	0.130	7.9	LOS A	0.5	12.8	0.65	0.65
18xb	R3	5	2.0	0.130	7.9	LOS A	0.5	12.8	0.65	0.65
Approach		74	2.0	0.130	7.9	LOS A	0.5	12.8	0.65	0.65
East WB Carlyon Ave										
1b	L3	11	2.0	0.476	15.4	LOS B	2.5	62.8	0.74	0.80
1a	L1	142	2.0	0.476	15.4	LOS B	2.5	62.8	0.74	0.80
16b	R3	95	2.0	0.476	15.4	LOS B	2.5	62.8	0.74	0.80
Approach		247	2.0	0.476	15.4	LOS B	2.5	62.8	0.74	0.80
Northeast: SB Capitol Blvd										
1bx	L3	79	2.0	0.728	15.0	LOS B	8.0	203.6	0.71	0.54
1x	L2	21	2.0	0.728	15.0	LOS B	8.0	203.6	0.71	0.54
6x	T1	1537	2.0	0.728	14.9	LOS B	8.0	203.6	0.71	0.53
Approach		1637	2.0	0.728	14.9	LOS B	8.0	203.6	0.71	0.53
SouthWest: NB Capitol Blvd										
2x	T1	905	2.0	0.450	7.6	LOS A	3.2	80.2	0.38	0.21
12ax	R1	158	2.0	0.450	7.6	LOS A	3.2	80.2	0.38	0.21
12x	R2	26	2.0	0.450	7.6	LOS A	3.2	80.2	0.38	0.21
Approach		1089	2.0	0.450	7.6	LOS A	3.2	80.2	0.38	0.21
All Vehicles		3047	2.0	0.728	12.2	LOS B	8.0	203.6	0.59	0.44
										31.5

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik MSD).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: N:\projects\0625_City of Tumwater\0625.17 Tumwater Transportation Master Plan\TrafficOperations\sidra\2040 Baseline\10) Carlyon Ave at Capitol Blvd\sidp

HCM 2010 TWSC

11: Deschutes Way & I-5 NB On-Ramp

Projected 2040 No Build

PM Peak Hour

Intersection							
Int Delay, s/veh	1.4						
Movement	SEL	SET	NWT	NWR	SWL	SWR	
Traffic Vol, veh/h	165	405	275	140	0	0	
Future Vol, veh/h	165	405	275	140	0	0	
Conflicting Peds, #/hr	0	0	0	0	0	0	
Sign Control	Free	Free	Free	Free	Stop	Stop	
RT Channelized	-	None	-	None	-	None	
Storage Length	-	-	-	-	0	-	
Veh in Median Storage, #	-	0	0	0	0	-	
Grade, %	-	0	0	-	0	-	
Peak Hour Factor	95	95	95	95	95	95	
Heavy Vehicles, %	0	0	1	1	0	0	
Mvmt Flow	174	426	289	147	0	0	

Major/Minor	Major1	Major2	Minor2	
Conflicting Flow All	437	0	1137	363
Stage 1	-	-	363	-
Stage 2	-	-	774	-
Critical Hdwy	4.1	-	7.1	6.2
Critical Hdwy Sig 1	-	-	6.1	-
Critical Hdwy Sig 2	-	-	6.1	-
Follow-up Hdwy	2.2	-	-	3.5
Pot Cap-1 Maneuver	1134	-	-	181
Stage 1	-	-	-	660
Platoon blocked, %	-	-	-	394
Mov Cap-1 Maneuver	1134	-	-	153
Mov Cap-2 Maneuver	-	-	-	153
Stage 1	-	-	-	527
Stage 2	-	-	-	315
Approach	SE	NW	SW	
HCM Control Delay, s	2.5	0	0	
HCM LOS			A	
Minor Lane/Minor Mvmt	NWT	NWR	SEL	SET/SL/RL
Capacity (veh/h)	-	-	1134	-
HCM Lane v/c Ratio	-	-	0.153	-
HCM Control Delay (s)	-	-	8.7	0
HCM Lane LOS	-	-	A	A
HCM 95th Xile Q/veh	-	-	0.5	-

HCM 2010 TWSC
12: Deschutes Way & US 101 WB On-Ramp

Projected 2040 No Build
PM Peak Hour

Intersection									
Int Delay, s/veh		4.2							
Movement	EBL	EBR	NBL	NBT	SBT	SBR			
Traffic Vol, veh/h	0	0	515	430	360	30			
Future Vol, veh/h	0	0	515	430	360	30			
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	0	-			
Grade, %	0	-	-	0	-	-			
Peak Hour Factor	95	95	95	95	95	95			
Heavy Vehicles, %	0	0	1	1	1	0			
Mvmt Flow	0	0	542	453	379	32			

Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1932	411	0	-	0	
Stage 1	395	-	-	-	-	
Stage 2	1537	-	-	-	-	
Critical Hdwy	6.4	-	4.11	-	-	
Critical Hdwy Sig 1	5.4	-	-	-	-	
Critical Hdwy Sig 2	5.4	-	-	-	-	
Follow-up Hdwy	3.5	-	2.209	-	-	
Poi Cap-1 Maneuver	74	0	1153	-	-	
Stage 1	685	0	-	-	-	
Stage 2	198	0	-	-	-	
Platoon blocked, %						
Mov Cap-1 Maneuver	39	-	1153	-	-	
Mov Cap-2 Maneuver	39	-	-	-	-	
Stage 1	685	-	-	-	-	
Stage 2	105	-	-	-	-	

Approach	EB	NB		SB		
HCM Control Delay, s	0	5.9		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT EBL1	SBT	SBR		
Capacity (veh/h)	1153	-	-	-		
HCM Lane V/C Ratio	0.47	-	-	-		
HCM Control Delay (s)	10.9	0	-	-		
HCM Lane LOS	B	A	-	-		
HCM 95th %ile Q(veh)	2.6	-	-	-		

SimTraffic Performance Report

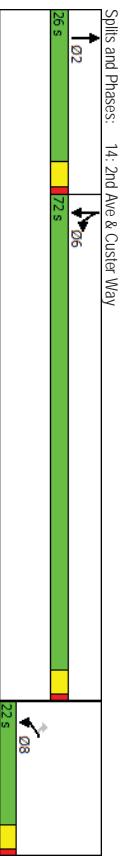
Projected 2040 Baseline
PM Peak Hour

13: 2nd Ave/US 101/I-5 Off-Ramps Performance by movement									
Movement	EBR	NBL	NBT	SBT	SBR	AI			
Denied Del/Veh (s)	0.2	0.0	0.0	518.6	471.9	349.2			
Total Del/Veh (s)	1.0	0.9	1.4	117.1	41.7	70.1			

Lanes, Volumes, Timings 14: 2nd Ave & Custer Way







Projected 2040 No Build
PM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	235	260	15	320	915	310
Future Volume (vph)	235	260	15	320	915	310
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	225	0	0	0	0
Storage Lanes	1	1	1	0	1	1
Taper Length (ft)	25				25	
Right Turn on Red		Yes		Yes		
Link Speed (mph)	30		30		30	
Link Distance (ft)	662		2035		505	
Travel Time (s)	15.0		46.3		11.5	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	1%	1%	1%	0%	0%
Shared Lane Traffic (%)						
Turn Type	Prot	Perm	NA		Split	NA
Protected Phases	8		2		6	6
Detector Phase	8	8	2		6	6
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0		4.0	4.0
Minimum Spill (s)	100	10.0	24.5		20.0	20.0
Total Split (s)	22.0	22.0	26.0		72.0	72.0
Total Split (%)	18.3%	18.3%	21.7%		60.0%	60.0%
Yellow Time (s)	3.5	3.5	3.5		3.5	3.5
All-Red Time (s)	1.0	1.0	1.0		1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5		4.5	4.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	None		Max	Max
Intersection Summary						
Area Type:	Other					
Cycle Length: 120						
Actuated Cycle Length: 107.8						
Natural Cycle: 100						
Control Type: Actuated-Uncoordinated						



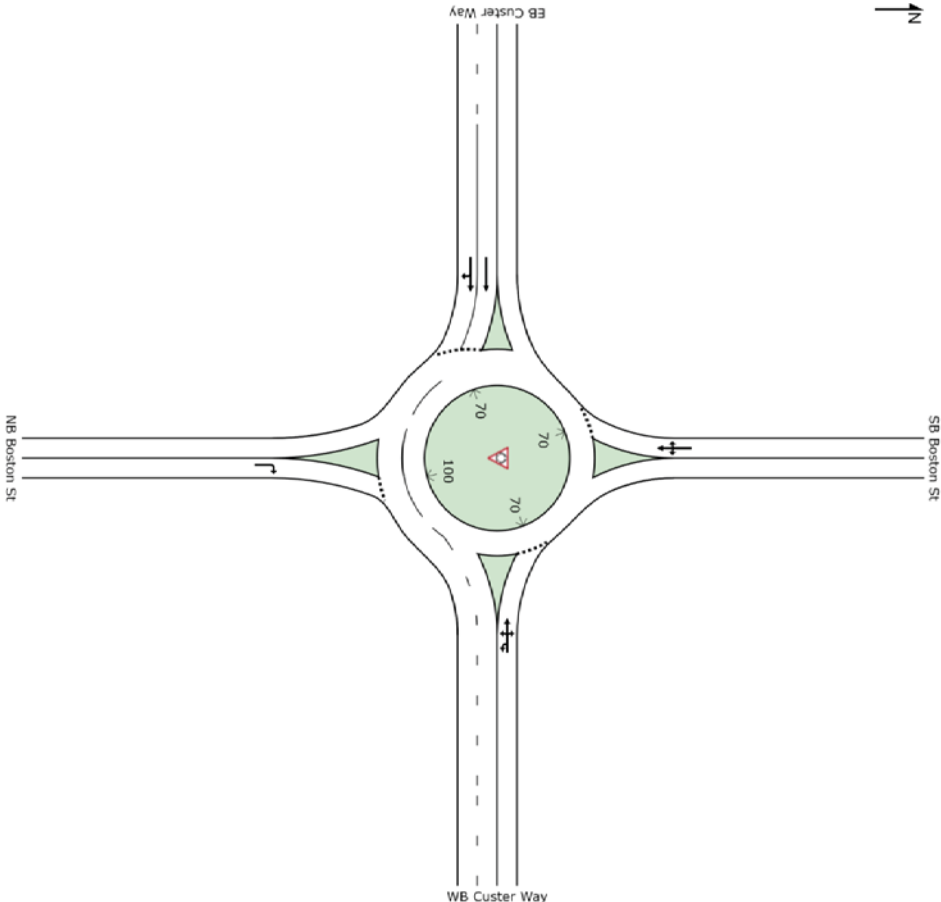
HCM 2010 Signalized Intersection Summary 14: 2nd Ave & Custer Way

Projected 2040 No Build
PM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT		
Lane Configurations								
Traffic Volume (veh/h)	235	260	15	320	915	310		
Future Volume (veh/h)	235	260	15	320	915	310		
Number	3	18	2	12	1	6		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped.Bike Adj(A_pbT)	1.00	1.00	1.00	1.00	1.00	1.00		
Parking Bus. Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/hln	1881	1881	1881	1900	1900	1900		
Adj Flow Rate, veh/h	247	121	16	184	963	326		
Adj No. of Lanes	1	1	1	0	1	1		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95		
Percent Heavy Veh. %	1	1	1	1	0	0		
Cap. veh/h	273	244	18	211	1065	1118		
Arrive On Green	0.15	0.15	0.14	0.14	0.59	0.59		
Sat Flow, veh/h	1792	1599	129	1489	1810	1900		
Grp Volume(v), veh/h	247	121	0	200	963	326		
Grp Sat Flow(s), veh/hln	1792	1599	0	1618	1810	1900		
Q Serve(g.s), s	15.5	8.0	0.0	13.9	53.7	9.8		
Cycle Q Clear(g.c), s	15.5	8.0	0.0	13.9	53.7	9.8		
Prop In Lane	1.00	1.00	0.92	1.00				
Lane Grp Cap(c), veh/h	273	244	0	229	1065	1118		
V/C Ratio(X)	0.90	0.50	0.00	0.87	0.90	0.29		
Avail Cap(C_a), veh/h	273	244	0	303	1065	1118		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(f)	1.00	1.00	0.00	1.00	1.00	1.00		
Uniform Delay (d), s/veh	47.8	44.6	0.0	48.2	20.8	11.7		
Incr Delay (d2), s/veh	30.1	0.6	0.0	15.9	12.4	0.7		
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackQ(50%),veh/hln	100	3.6	0.0	7.2	30.2	5.3		
LnGrp Delay(d), s/veh	77.8	45.1	0.0	64.2	33.2	12.4		
LnGrp LOS	E	D		E	C	B		
Approach Vol, veh/h	368		200		1289			
Approach Delay, s/veh	67.1		64.2		27.9			
Approach LOS	E		E		C			
Timer	1	2	3	4	5	6	7	8
Assigned Pts		2				6		8
Pts Duration (G+Y+Rc), s		20.7				72.0		22.0
Change Period (Y+Rc), s		4.5				4.5		4.5
Max Green Setting (Gmax), s		21.5				67.5		17.5
Max Q Clear Time (Q_c+H), s		15.9				55.7		17.5
Green Ext Time (P_c), s		0.4				4.9		0.0
Intersection Summary								
HCM 2010 Ctrl Delay	39.6							
HCM 2010 LOS	D							

SITE LAYOUT

Site: (15) Cluster Way at Boston St
Projected 2040 Baseline
Roundabout



MOVEMENT SUMMARY

Site: (15) Cluster Way at Boston St
Projected 2040 Baseline
Roundabout

Movement Performance - Vehicles										
Mov ID	OD Mov	Demand Flows Total veh/h	Flow %	Deg Satm w/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles	Distance Queued ft	Prop. Queued	Effective Stop Rate per veh
18	R2	121	2.0	0.234	10.2	LOS B	1.1	26.8	0.72	0.72
Approach		121	2.0	0.234	10.2	LOS B	1.1	26.8	0.72	0.72
East: WB Cluster Way										
10	U	26	2.0	0.697	13.0	LOS B	0.0	0.0	0.00	0.00
1	L2	247	2.0	0.697	13.0	LOS B	0.0	0.0	0.00	0.00
6	T1	568	2.0	0.697	13.0	LOS B	0.0	0.0	0.00	0.00
16	R2	5	2.0	0.697	13.0	LOS B	0.0	0.0	0.00	0.00
Approach		847	2.0	0.697	13.0	LOS B	0.0	0.0	0.00	0.00
North: SB Boston St										
7	L2	5	2.0	0.027	6.5	LOS A	0.1	3.6	0.70	0.54
4	T1	5	2.0	0.027	6.5	LOS A	0.1	3.6	0.70	0.54
14	R2	5	2.0	0.027	6.5	LOS A	0.1	3.6	0.70	0.54
Approach		16	2.0	0.027	6.5	LOS A	0.1	3.6	0.70	0.54
West: EB Cluster Way										
2	T1	1047	2.0	0.609	11.4	LOS B	5.4	136.1	0.67	0.55
12	R2	279	2.0	0.609	11.1	LOS B	5.3	134.8	0.67	0.53
Approach		1326	2.0	0.609	11.4	LOS B	5.4	136.1	0.67	0.54
All Vehicles		2311	2.0	0.697	11.9	LOS B	5.4	136.1	0.43	0.35

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1, irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: SIDRA Standard (Arcecik MSD).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.







Lanes, Volumes, Timings
16: Deschutes Way & Boston St

Projected 2040 No Build
PM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBR
Lane Configurations	🚦		🚦			🚦
Traffic Volume (vph)	180	290	615	70	100	290
Future Volume (vph)	180	290	615	70	100	290
Ideal Flow (vpphl)	1900	1900	1900	1900	1900	1900
Right Turn on Red		Yes		Yes		
Link Speed (mph)	30		30			30
Link Distance (ft)	679		1427			1098
Travel Time (s)	15.4		32.4			25.0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	1%	0%	0%	0%	0%
Shared Lane Traffic (%)						
Turn Type	Prot		NA		Pem	NA
Protected Phases	8		2			6
Permitted Phases					6	
Detector Phase	8		2		6	6
Switch Phase						
Minimum Initial (s)	4.0		4.0		4.0	4.0
Minimum Spill (s)	20.0		20.0		20.0	20.0
Total Split (s)	21.0		34.0		34.0	34.0
Total Split (%)	38.2%		61.8%		61.8%	61.8%
Yellow Time (s)	3.5		3.5		3.5	3.5
All-Red Time (s)	0.5		0.5		0.5	0.5
Lost Time Adjust (s)	0.0		0.0		0.0	0.0
Total Lost Time (s)	4.0		4.0			4.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None		Mfn		Mfn	Mfn
Intersection Summary						
Area Type:	Other					
Cycle Length: 55						
Actuated Cycle Length: 45.1						
Natural Cycle: 55						
Control Type: Actuated-Uncoordinated						

16: Deschutes Way & Boston St

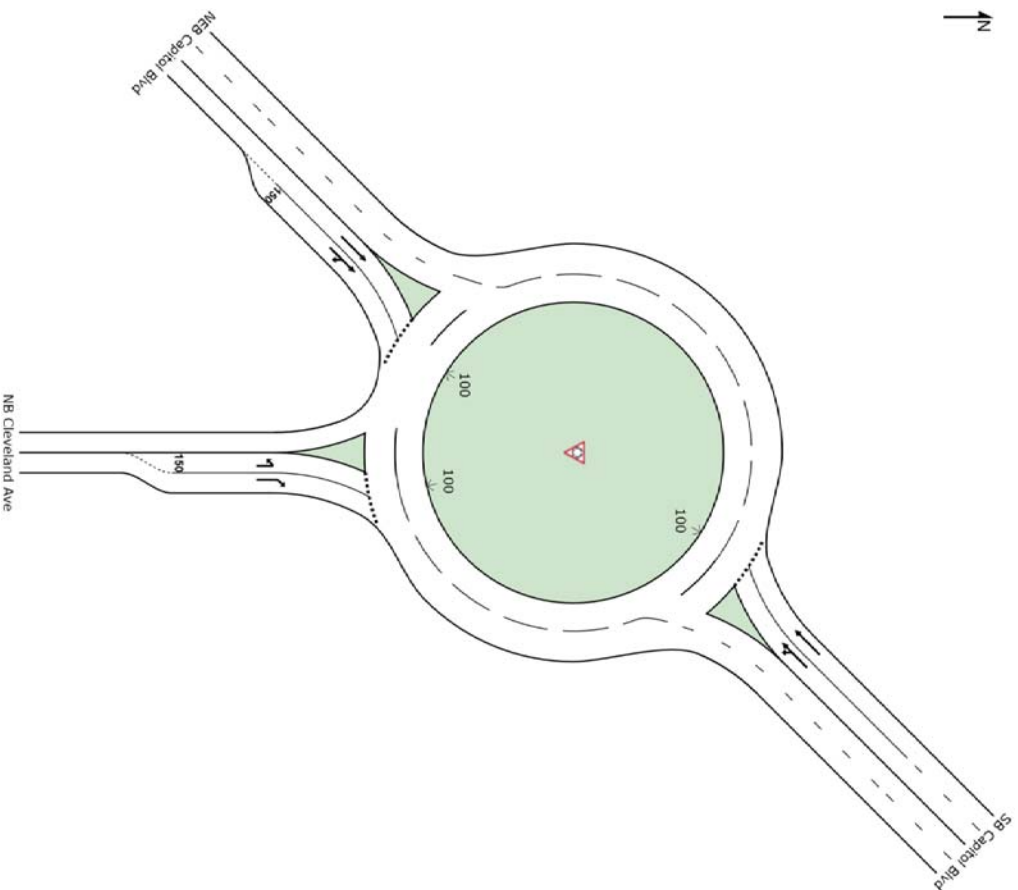
Projected 2040 No Build
PM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SRT		
Lane Configurations	 4	 4	 4	 4	 4	 4		
Traffic Volume (veh/h)	180	290	615	70	100	290		
Future Volume (veh/h)	180	290	615	70	100	290		
Number	3	18	2	12	1	6		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped Bike Adj(A, pb)	1.00	1.00		1.00	1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/in	1881	1900	1900	1900	1900	1900		
Adj Flow Rate, veh/h	189	305	647	74	105	305		
Adj No. of Lanes	0	0	1	0	0	1		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95		
Percent Heavy Veh. %	0	0	0	0	0	0		
Cap. veh/h	206	332	880	101	165	435		
Arrive On Green	0.32	0.32	0.53	0.53	0.53	0.53		
Sat Flow, veh/h	637	1028	1675	192	150	828		
Gp Volume(s), veh/h	495	0	0	721	410	0		
Gp Sat Flow(s),veh/h/in	1668	0	0	1866	978	0		
Q Serve(g, s)	15.1	0.0	0.0	15.7	6.2	0.0		
Cycle Q Clear(g-c), s	15.1	0.0	0.0	15.7	21.9	0.0		
Prop In Lane	0.38	0.62	0.10	0.26				
Lane Gp Cap(c), veh/h	538	0	0	980	600	0		
W/C Ratio(x)	0.92	0.00	0.00	0.74	0.68	0.00		
Avail Cap(c, x), veh/h	538	0	0	1063	660	0		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(f)	1.00	0.00	0.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	17.2	0.0	0.0	9.7	10.1	0.0		
Incr Delay (d2), s/veh	21.1	0.0	0.0	2.5	2.6	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackQ(50%)veh/h	10.0	0.0	0.0	8.7	5.7	0.0		
ncnp Delay(d), s/veh	38.3	0.0	0.0	12.1	12.7	0.0		
ncnp LOS	D			B	B			
Approach Vol, veh/h	495		721		410			
Approach Delay, s/veh	38.3		12.1		12.7			
Approach LOS	D		B		B			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		31.7				31.7		21.0
Change Period (Y+Rc), s		4.0				4.0		4.0
Max Green Setting (Gmax), s		30.0				30.0		17.0
Max Q Clear Time (g-c+1), s		17.7				23.9		17.1
Green Ext Time (p-c), s		6.4				3.8		0.0

SITE LAYOUT

Site: 17) Cleveland Ave at Capitol Blvd

Projected 2040 Baseline
Roundabout



MOVEMENT SUMMARY

Site: 17) Cleveland Ave at Capitol Blvd

Projected 2040 Baseline
Roundabout

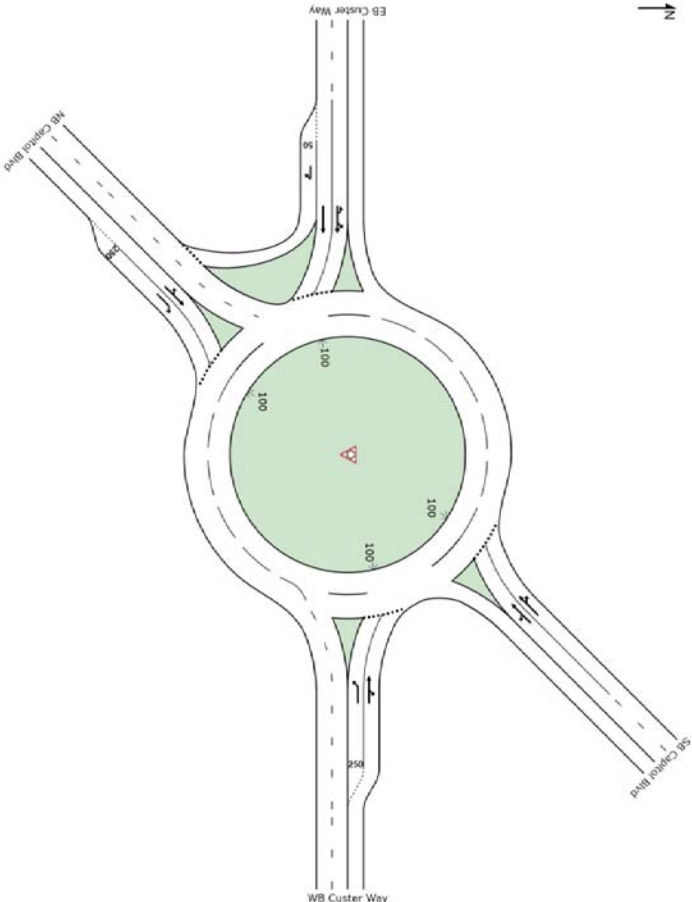
Movement Performance - Vehicles										
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satm w/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance Queued ft	Prop. Queued	Effective Stop Rate per veh
South: NB Cleveland Ave										
3b	L3	26	2.0	0.059	8.8	LOS A	0.2	5.5	0.61	0.59
18a	R1	311	2.0	0.382	9.0	LOS A	1.9	49.2	0.67	0.68
Approach										
		337	2.0	0.382	9.0	LOS A	1.9	49.2	0.67	0.68
Northeast: SB Capitol Blvd										
1ax	L1	468	2.0	0.663	11.3	LOS B	7.4	187.8	0.27	0.09
6x	T1	1268	2.0	0.663	11.3	LOS B	7.4	187.8	0.27	0.09
Approach										
		1737	2.0	0.663	11.3	LOS B	7.4	187.8	0.27	0.09
SouthWest: NEB Capitol Blvd										
2x	T1	789	2.0	0.434	8.9	LOS A	2.6	66.7	0.64	0.56
12bx	R3	21	2.0	0.434	8.8	LOS A	2.6	66.7	0.64	0.55
Approach										
		811	2.0	0.434	8.9	LOS A	2.6	66.7	0.64	0.56
All Vehicles										
		2884	2.0	0.663	10.4	LOS B	7.4	187.8	0.42	0.29

Level of Service (LOS) Method: Delay & w/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and w/c ratio (degree of saturation) per movement.
LOS F will result if w/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements w/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap Acceptance Capacity: SIDRA Standard (Akceik MGD).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: (18) Cluster Way at Capitol Blvd

Projected 2040 Baseline
Roundabout



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Project: N:\Projects\0625 City of Tumwater\0625_17 Tumwater Transportation Master Plan\Traffic\Operations\sidra2040 Baseline\18-Cluster Way at Capitol Blvd.sip6

MOVEMENT SUMMARY

Site: (18) Cluster Way at Capitol Blvd

Projected 2040 Baseline
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	Flow %	Deg. of Satm v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
East WB Cluster Way											
1a	L1	200	2.0	0.508	20.8	LOS C	3.7	94.1	0.92	1.00	26.8
6	T1	442	2.0	0.841	37.2	LOS D	12.5	317.8	1.00	1.38	23.6
16b	R3	5	2.0	0.841	37.2	LOS D	12.5	317.8	1.00	1.38	22.9
Approach		647	2.0	0.841	32.1	LOS C	12.5	317.8	0.97	1.26	24.5
Northeast SB Capitol Blvd											
1bx	L3	37	2.0	0.830	28.4	LOS C	9.3	236.5	0.95	1.15	26.1
6x	T1	911	2.0	0.830	27.7	LOS C	9.6	244.8	0.95	1.15	26.1
16ax	R1	316	2.0	0.830	26.5	LOS C	9.6	244.8	0.96	1.15	26.3
Approach		1263	2.0	0.830	27.4	LOS C	9.6	244.8	0.95	1.15	26.1
West EB Cluster Way											
5u	U	26	2.0	0.850	36.4	LOS D	9.1	230.8	0.99	1.25	23.4
5a	L1	379	2.0	0.850	36.4	LOS D	9.1	230.8	0.99	1.25	22.8
2	T1	721	2.0	0.850	30.5	LOS C	10.3	261.1	1.00	1.27	25.2
12b	R3	79	2.0	0.099	5.5	LOS A	0.6	14.2	0.75	0.65	33.4
Approach		1205	2.0	0.850	30.8	LOS C	10.3	261.1	0.98	1.22	24.7
SouthWest NB Capitol Blvd											
5bx	L3	21	2.0	1.032	73.4	LOS F	20.8	528.5	1.00	1.78	17.3
2x	T1	563	2.0	1.032	73.4	LOS F	20.8	528.5	1.00	1.78	17.2
12ax	R1	195	2.0	0.538	23.6	LOS C	2.9	73.8	0.84	0.90	27.2
Approach		779	2.0	1.032	60.9	LOS E	20.8	528.5	0.96	1.56	18.9
All Vehicles		3895	2.0	1.032	36.0	LOS D	20.8	528.5	0.97	1.27	23.6

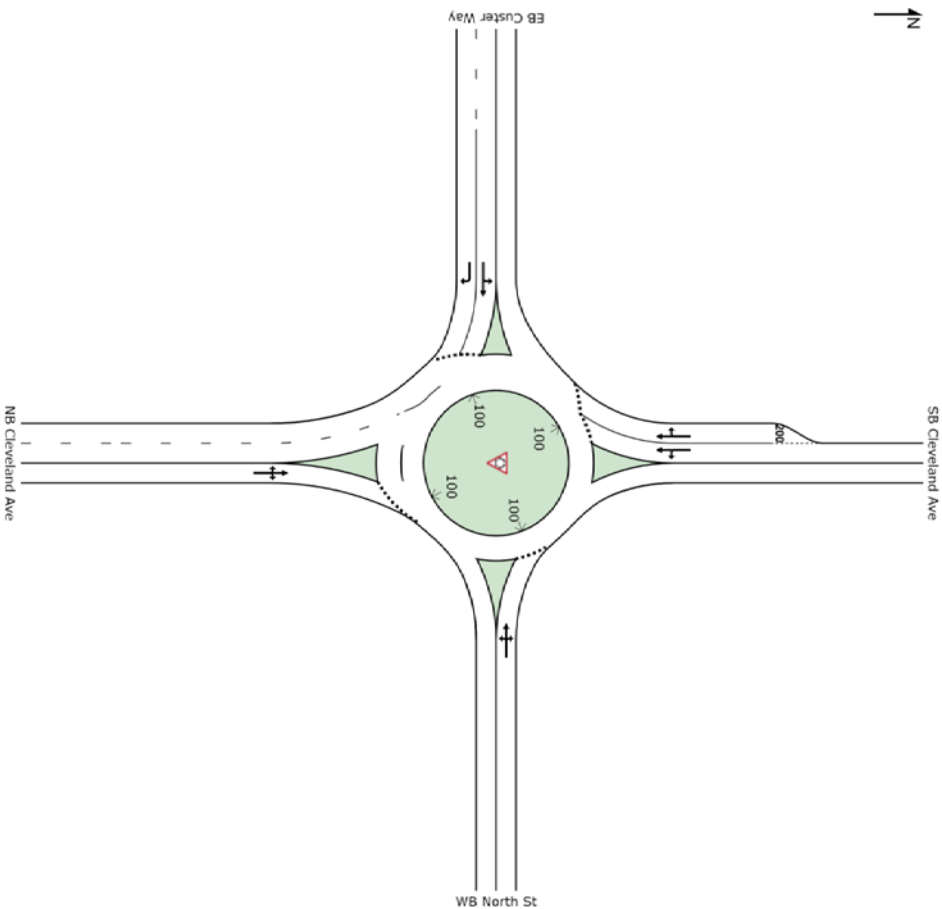
Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: SIDRA Standard (Alcelik MSD).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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SITE LAYOUT

Site: 19) Cluster Way at Cleveland Ave/North St

Projected 2040 Baseline
Roundabout



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MOVEMENT SUMMARY

Site: 19) Cluster Way at Cleveland Ave/North St

Projected 2040 Baseline
Roundabout

Movement Performance - Vehicles											
Mov ID	OD	Demand Flows Total veh/h	Flow HVs %	Deg. of Satm w/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles	Distance ft	Pop. Queued	Effective Stop Rate per veh	Average Speed mph
South: NB Cleveland Ave											
3	L2	163	2.0	0.683	21.8	LOS C	6.5	166.3	0.93	1.06	27.3
8	T1	216	2.0	0.683	21.8	LOS C	6.5	166.3	0.93	1.06	27.3
18	R2	21	2.0	0.683	21.8	LOS C	6.5	166.3	0.93	1.06	26.7
Approach											
		400	2.0	0.683	21.8	LOS C	6.5	166.3	0.93	1.06	27.3
East: WB North St											
1	L2	16	2.0	0.636	15.4	LOS B	6.5	165.5	0.88	0.88	30.3
6	T1	411	2.0	0.636	15.4	LOS B	6.5	165.5	0.88	0.88	30.3
16	R2	74	2.0	0.636	15.4	LOS B	6.5	165.5	0.88	0.88	29.5
Approach											
		500	2.0	0.636	15.4	LOS B	6.5	165.5	0.88	0.88	30.2
North: SB Cleveland Ave											
7	L2	121	2.0	0.397	9.9	LOS A	2.8	70.4	0.80	0.73	31.8
4	T1	368	2.0	0.397	9.3	LOS A	3.0	75.1	0.80	0.71	32.5
14	R2	158	2.0	0.397	8.7	LOS A	3.0	75.1	0.80	0.69	32.2
Approach											
		647	2.0	0.397	9.3	LOS A	3.0	75.1	0.80	0.71	32.3
West: EB Cluster Way											
5	L2	74	2.0	0.587	11.9	LOS B	5.8	146.5	0.85	0.80	31.6
2	T1	489	2.0	0.587	11.9	LOS B	5.8	146.5	0.85	0.80	31.6
12	R2	326	2.0	0.427	10.3	LOS B	3.0	75.6	0.77	0.70	31.3
Approach											
		889	2.0	0.587	11.3	LOS B	5.8	146.5	0.82	0.76	31.5
All Vehicles											
		2437	2.0	0.683	13.3	LOS B	6.5	166.3	0.84	0.82	30.6

Level of Service (LOS) Method: Delay & w/c (HCM 2010).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay and w/c ratio (degree of saturation) per movement. LOS F will result if w/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements w/c not used as specified in HCM 2010.

Roundabout Capacity Model: SIDRA Standard.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap Acceptance Capacity: SIDRA Standard (Akceik MGD).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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HCM 2010 TWSC
20: Hoady St & North St

Projected 2040 No Build
PM Peak Hour

Intersection												
Int Delay, s/veh	3.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	75	4/75	5	15	590	80	2	5	10	45	2	25
Future Vol, veh/h	75	4/75	5	15	590	80	2	5	10	45	2	25
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	1	1	1	1	1	1	0	0	0	0	0	0
Mvmt Flow	79	500	5	16	621	84	2	5	11	47	2	26

Major/Minor	Major1	Major2			Minor1	Minor2		
Conflicting Flow All	705	0	0	505	0	0	1370	1398
Stage 1	-	-	-	-	-	-	661	661
Stage 2	-	-	-	-	-	-	709	737
Critical Hdwy	4.11	-	-	4.11	-	-	7.1	6.5
Critical Hdwy Sig 1	-	-	-	-	-	-	6.1	5.5
Critical Hdwy Sig 2	-	-	-	-	-	-	6.1	5.5
Follow-up Hdwy	2.209	-	-	2.209	-	-	3.5	4
Poi Cap-1 Maneuver	898	-	-	1065	-	-	125	142
Stage 1	-	-	-	-	-	-	455	463
Stage 2	-	-	-	-	-	-	428	428
Platoon blocked, %	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	898	-	-	1065	-	-	104	122
Mov Cap-2 Maneuver	-	-	-	-	-	-	104	122
Stage 1	-	-	-	-	-	-	399	407
Stage 2	-	-	-	-	-	-	392	417

Approach	EB			WB			NB			SB
HCM Control Delay, s	1.3			0.2			22.9			53.6
HCM LOS							C			F
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1		
Capacity (veh/h)	219	898	-	-	1065	-	-	146		
HCM Lane V/C Ratio	0.082	0.088	-	-	0.015	-	-	0.519		
HCM Control Delay (s)	22.9	9.4	0	0	8.4	0	0	53.6		
HCM Lane LOS	C	A	A	A	A	A	F	F		
HCM 95th %ile Q(veh)	0.3	0.3	-	-	0	-	-	2.5		

SimTraffic Performance Report

Projected 2040 Baseline
PM Peak Hour

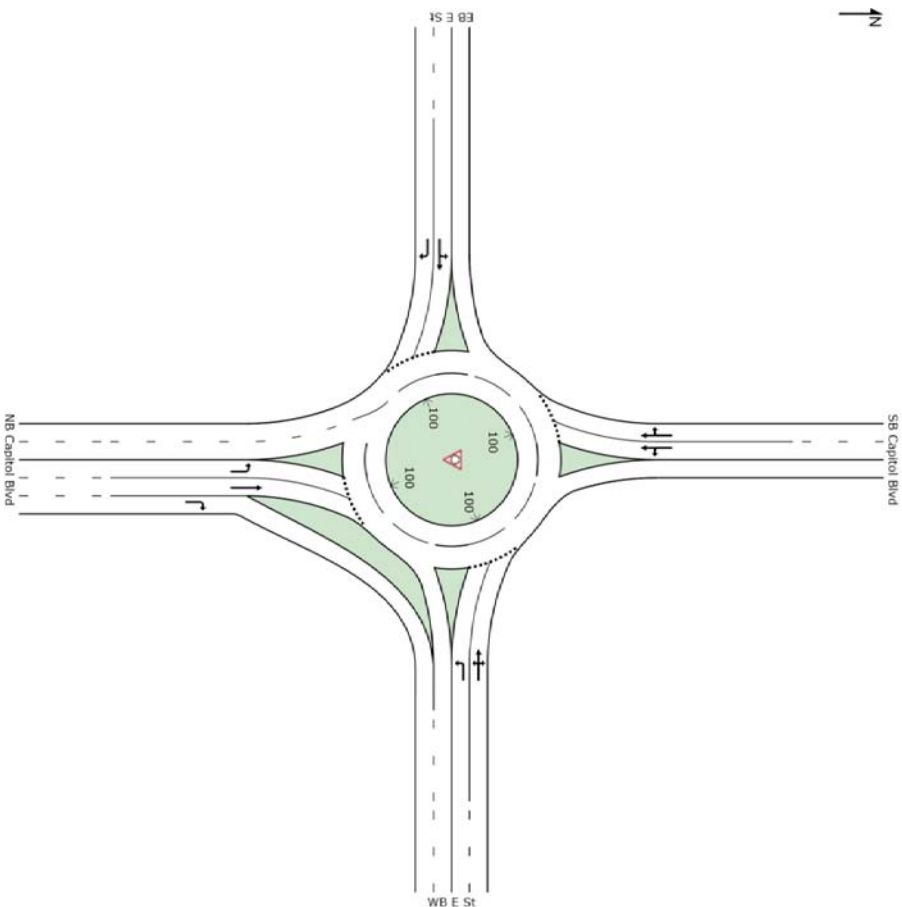
21: I-5 NB Off-Ramp/Deschutes Way & E St Performance by movement

Movement	WBR	NBT	NBR	SBL	All
Denied Del/Veh (s)	0.5	0.3	0.3	0.4	0.4
Total Del/Veh (s)	2.3	30.3	4.8	1.2	3.5

SITE LAYOUT

Site: 22) E St at Capitol Blvd

Projected 2040 Baseline
Roundabout



MOVEMENT SUMMARY

Site: 22) E St at Capitol Blvd

Projected 2040 Baseline
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total HV veh/h	Flow %	Deg. of Satm w/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles	Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: NB Capitol Blvd											
3	L2	211	2.0	0.274	7.8	LOS A	1.8	46.3	0.78	0.69	31.4
8	T1	453	2.0	0.439	8.4	LOS A	3.7	92.8	0.86	0.74	33.5
18	R2	605	2.0	0.369	0.1	LOS A	0.0	0.0	0.00	0.00	37.1
Approach		1268	2.0	0.439	4.3	LOS A	3.7	92.8	0.44	0.38	34.7
East: WB E St											
1	L2	674	2.0	0.710	18.3	LOS B	6.6	168.0	0.86	0.98	27.8
6	T1	384	2.0	0.710	16.4	LOS B	6.6	168.0	0.86	0.97	29.6
16	R2	147	2.0	0.710	16.4	LOS B	6.6	168.0	0.86	0.97	28.8
Approach		1205	2.0	0.710	17.4	LOS B	6.6	168.0	0.86	0.97	28.5
North: SB Capitol Blvd											
7	L2	232	2.0	1.062	85.0	LOS F	23.7	601.8	1.00	1.96	15.7
4	T1	916	2.0	1.062	79.3	LOS F	29.1	740.3	1.00	2.05	16.3
14	R2	142	2.0	1.062	76.1	LOS F	29.1	740.3	1.00	2.10	16.5
Approach		1289	2.0	1.062	79.9	LOS E	29.1	740.3	1.00	2.04	16.2
West: EB E St											
5	L2	63	2.0	0.917	47.9	LOS D	12.6	319.5	1.00	1.49	21.2
2	T1	437	2.0	0.917	47.9	LOS D	12.6	319.5	1.00	1.49	21.1
12	R2	342	2.0	0.895	56.2	LOS E	9.2	232.9	0.97	1.35	19.1
Approach		842	2.0	0.917	51.3	LOS D	12.6	319.5	0.99	1.44	20.3
All Vehicles		4605	2.0	1.062	37.5	LOS D	29.1	740.3	0.81	1.19	23.0

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement. LOS F will result if $v/c > 1$ irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements v/c not used as specified in HCM 2010).

Roundabout Capacity Model: SIDRA Standard.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap Acceptance Capacity: SIDRA Standard (Akceik MGD).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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HCM 2010 TWSC
23: Cleveland Ave & South St

Projected 2040 No Build
PM Peak Hour

Intersection							
Int Delay, s/veh		1.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT	
Traffic Vol, veh/h	5	45	915	10	60	1220	
Future Vol, veh/h	5	45	915	10	60	1220	
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	95	95	95	95	95	95	
Heavy Vehicles, %	0	0	1	1	1	1	
Mvmt Flow	5	47	963	11	63	1284	

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1736	487	0	0	974	0
Stage 1	968	-	-	-	-	-
Stage 2	768	-	-	-	-	-
Critical Hdwy	6.8	6.9	-	-	4.12	-
Critical Hdwy Sig 1	5.8	-	-	-	-	-
Critical Hdwy Sig 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.21	-
Pot Cap-1 Maneuver	80	532	-	-	710	-
Stage 1	334	-	-	-	-	-
Stage 2	424	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	55	532	-	-	710	-
Mov Cap-2 Maneuver	55	-	-	-	-	-
Stage 1	334	-	-	-	-	-
Stage 2	293	-	-	-	-	-

Approach	WB		NB		SB	
HCM Control Delay, s	20.5		0		1.9	
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBR/WBL1	SBL	SBT		
Capacity (veh/h)	-	285	710	-		
HCM Lane V/C Ratio	-	0.185	0.089	-		
HCM Control Delay (s)	-	20.5	10.6	1.5		
HCM Lane LOS	-	C	B	A		
HCM 95th %ile D(veh)	-	0.7	0.3	-		

HCM 2010 TWSC
24: Linwood Ave & 7th Ave

Projected 2040 No Build
PM Peak Hour

Intersection												
Int Delay, s/veh		8.5										
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	25	155	0	1	345	175	0	0	1	220	0	20
Future Vol, veh/h	25	155	0	1	345	175	0	0	1	220	0	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	3	3	3	1	1	1	0	0	0	1	1	1
Mvmt Flow	26	163	0	1	363	184	0	0	1	232	0	21

Major/Minor	Major1		Major2		Minor1		Minor2	
Conflicting Flow All	547	0	163	0	684	765	163	673
Stage 1	-	-	-	-	216	216	-	457
Stage 2	-	-	-	-	468	549	-	216
Critical Hdwy	4.13	-	4.11	-	7.1	6.5	6.2	7.11
Critical Hdwy Sig 1	-	-	-	-	6.1	5.5	-	6.11
Critical Hdwy Sig 2	-	-	-	-	6.1	5.5	-	6.11
Follow-up Hdwy	2.227	-	2.209	-	3.5	4	3.3	3.509
Pot Cap-1 Maneuver	1017	-	1422	-	365	336	887	370
Stage 1	-	-	-	-	791	728	-	585
Stage 2	-	-	-	-	579	520	-	789
Platoon blocked, %	-	-	-	-	-	-	-	726
Mov Cap-1 Maneuver	1017	-	1422	-	345	326	887	361
Mov Cap-2 Maneuver	-	-	-	-	345	326	-	361
Stage 1	-	-	-	-	769	708	-	569
Stage 2	-	-	-	-	558	519	-	766

Approach	EB		WB		NB		SB	
HCM Control Delay, s	1.2		0		9.1		32.5	
HCM LOS	D				A		D	
Minor Lane/Major Mvmt	NBL1	EBL	EBT	EBR	WBL	WBT	WBR/SBL1	
Capacity (veh/h)	887	1017	-	-	1422	-	374	
HCM Lane V/C Ratio	0.001	0.026	0	-	0.001	-	0.675	
HCM Control Delay (s)	9.1	8.6	0	-	7.5	0	32.5	
HCM Lane LOS	A	A	A	-	A	-	D	
HCM 95th %ile D(veh)	0	0.1	-	-	0	-	4.8	

HCM 2010 AWSC
25: Linwood Ave & 2nd Ave

Projected 2040 No Build
PM Peak Hour

Intersection													
Intersection Delay, s/veh										57.6			
Intersection LOS										F			
Movement													
Traffic Vol, veh/h	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	
Future Vol, veh/h	0	130	145	130	0	250	305	65	0	180	305	65	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Heavy Vehicles, %	2	1	1	1	2	1	1	1	2	0	0	0	
Mvmt Flow	0	137	153	137	0	263	321	68	0	189	321	68	
Number of Lanes	0	1	1	1	0	1	1	1	0	1	1	0	
Approach													
EB							WB						
Opposing Approach							WB						
Opposing Lanes							2						
Conflicting Approach Left							NB						
Conflicting Lanes Left							2						
Conflicting Approach Right							SB						
Conflicting Lanes Right							2						
HCM Control Delay							35						
HCM LOS							D						
Lane													
NBLn1 NBLn2 EBLn1 EBLn2 WBLn1 WBLn2 SBLn1 SBLn2													
Vol Left, %	100%		0%		100%		0%		100%		0%		
Vol Thru, %	0%		82%		0%		53%		0%		82%		65%
Vol Right, %	0%		18%		0%		47%		0%		18%		35%
Sign Control	Stop		Stop		Stop		Stop		Stop		Stop		
Traffic Vol by Lane	180		370		130		275		250		370		510
LT Vol	180		0		130		0		250		0		180
Through Vol	0		305		0		145		0		305		330
RT Vol	0		65		0		130		0		65		180
Lane Flow Rate	189		389		137		289		263		389		537
Geometry Grp	7		7		7		7		7		7		
Degree of Util (X)	0.543		1		0.407		0.795		0.749		1		0.549
Departure Headway (Hd)	10.324		9.703		10.717		9.888		10.242		9.621		10.429
Convergence, Y/N	Yes		Yes		Yes		Yes		Yes		Yes		Yes
Cap	351		378		338		368		355		378		381
Service Time	8.049		7.428		8.428		7.599		7.964		7.343		8.062
HCM Lane V/C Ratio	0.538		1.029		0.405		0.785		0.741		1.029		0.538
HCM Control Delay	24.7		78.6		20.6		41.8		38		78.2		25
HCM Lane LOS	C		F		C		E		F		C		F
HCM 95th-ile Q	3.1		11.8		1.9		6.7		5.8		11.8		3.1

HCM 2010 AWSC
25: Linwood Ave & 2nd Ave

Projected 2040 No Build
PM Peak Hour

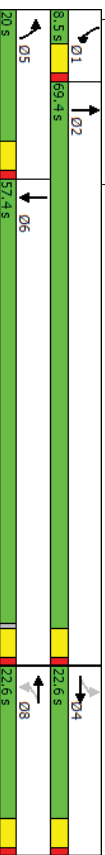
Intersection													
Intersection Delay, s/vch													
Intersection LOS													
Movement													
	SBU	SBL	SBT	SBR		SBU	SBL	SBT	SBR		SBU	SBL	SBT
Traffic Vol, veh/h	0	180	330	180									
Future Vol, veh/h	0	180	330	180									
Peak Hour Factor	0.95	0.95	0.95	0.95									
Heavy Vehicles, %	2	1	1	1									
Mvmt Flow	0	189	347	189									
Number of Lanes	0	1	1	0									
Approach													
	SB												
Opposing Approach	NB												
Opposing Lanes	2												
Conflicting Approach Left	WB												
Conflicting Lanes Left	2												
Conflicting Approach Right	EB												
Conflicting Lanes Right	2												
HCM Control Delay	64.2												
HCM LOS	F												
Lane													

Lanes, Volumes, Timings
26: Capitol Blvd & Linwood Ave

Projected 2040 No Build PM Peak Hour













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Splits and Phases: 26: Capitol Blvd & Linwood Ave



HCM 2010 Signalized Intersection Summary

Projected 2040 No Build
PM Peak Hour














Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	115	5	255	15	5	10	215	1090	15	10	1425	4000
Future Volume (veh/h)	115	5	255	15	5	10	215	1090	15	10	1425	4000
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Adj.) veh	0	0	0	0	0	0	0	0	0	0	0	0
Peak Bike Adj. (adj)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus. Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h	1881	1881	1900	1863	1863	1900	1881	1900	1863	1881	1900	1863
Adj Flow Rate, veh/h	121	5	268	16	5	11	226	1147	16	11	1500	421
Adj No. of Lanes	1	1	0	1	1	1	0	1	2	0	1	2
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh. %	1	2	2	2	2	2	1	1	1	2	1	1
Cap. veh/h	317	5	286	88	94	208	270	2424	34	19	1482	396
Arrive On Green	0.18	0.18	0.18	0.18	0.18	0.18	0.15	0.67	0.01	0.53	0.53	0.01
Sat Flow, veh/h	1405	29	1574	1102	519	1142	1792	3609	50	1774	2767	749
Grp Volume(s), veh/h	121	0	273	16	0	16	226	568	595	11	938	983
Grp Sat Flow(s),veh/h	1405	0	1603	1102	0	1661	1792	1787	1872	1774	1767	1749
Q Served(s), s	7.7	0.0	16.7	1.4	0.0	0.8	12.2	15.2	15.2	0.6	51.4	52.9
Cycle Q Clearing(c.), s	8.5	0.0	16.7	18.1	0.0	0.8	12.2	15.2	15.2	0.6	51.4	52.9
Prop In Lane	1.00	0.98	1.00	1.00	0.69	1.00	0.03	1.00	0.03	1.00	0.43	0.91
W/C Grp Cap(c.), veh/h	317	0	292	88	0	302	270	1200	1258	19	950	106
W/C Ratio(X)	0.38	0.00	0.94	0.18	0.00	0.05	0.84	0.47	0.47	0.59	0.99	1.04
Avail Cap(X, a), veh/h	317	0	292	88	0	302	279	1200	1258	71	950	930
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter()	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.1	0.0	40.1	49.1	0.0	33.6	41.1	7.9	7.9	49.0	22.9	23.3
Incr Delay (d2), s/veh	0.3	0.0	35.6	1.0	0.0	0.1	18.0	1.3	1.3	26.1	26.1	45.8
Initial Q Delay(d),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/h	3.0	0.0	10.2	0.5	0.0	0.4	7.4	7.9	8.2	0.4	31.9	37.2
LnGrp Delay(s)/veh	37.4	0.0	75.7	50.0	0.0	33.7	59.1	9.2	9.1	75.1	49.1	69.1
LnGrp LOS	D	D	E	D	D	C	E	A	E	E	D	F
Approach Vol, veh/h	394			32			1389			1932		
Approach Delay, s/veh	63.9			41.9			17.3			59.4		

Projected 2040 No Build
PM Peak Hour[illegible]

Splits and Phases: 27: Henderson Blvd & Yelm Hwy

02 05 06 08	47 s 39 s 44 s 45 s	03 04
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Projected 2040 No Build
PM Peak Hour

Movement													
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SRL	SRT	SBR	
Traffic Volume (veh/h)	10	955	195	510	780	85	140	200	700	230	335	30	335
Future Volume (veh/h)	10	955	195	510	780	85	140	200	700	230	335	30	335
Number	7	4	14	3	8	18	5	2	12	1	6	16	
Initial Q (Qd), veh	0	0	0	0	0	0	0	0	0	0	0	0	
Ped-Bike Adj.(Adj.)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Parking Bus, Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Adj Sat Flow, veh/h	1881	1881	1900	1881	1881	1900	1881	1881	1881	1881	1881	1881	
Adj Flow Rate, veh/h	11	1005	205	537	821	89	147	211	0	242	333	32	333
Aid No. of Lanes	1	2	0	1	2	0	1	1	1	1	1	1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Percent Heavy Veh. %	1	1	1	1	1	1	1	1	1	1	1	1	
Cap. veh/h	243	899	183	475	1965	213	145	615	947	304	398	338	398
Arrive On Green	0.30	0.30	0.30	0.27	0.60	0.60	0.60	0.33	0.00	0.21	0.21	0.21	0.21
Sat Flow, veh/h	617	2960	602	1792	3253	353	1792	1881	1599	1177	1881	1599	1177
Grip Volume(s), veh/h	11	606	604	537	587	459	147	211	0	242	333	32	333
Grip Flow(s), veh/h	617	1781	1775	1792	1792	1819	1792	1881	1599	1177	1881	1599	1177
Q Served(s), s	1.6	39.5	39.5	34.5	17.4	17.4	10.5	11.1	0.0	26.5	23.7	2.1	26.5
Cycle Q Clearing(c.), s	1.6	39.5	39.5	34.5	17.4	17.4	10.5	11.1	0.0	26.5	23.7	2.1	26.5
Prop In Lane	1.00	0.34	1.00	0.19	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Grp Cap(c), veh/h	243	543	539	475	1079	1098	145	615	947	304	398	338	398
W/C Ratio(X)	0.05	1.12	1.12	1.13	0.42	0.42	1.02	0.34	0.00	0.79	0.89	0.09	0.89
Avail Cap(c), veh/h	243	543	539	475	1079	1098	145	615	947	304	398	338	398
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter()	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.1	45.2	45.3	47.8	13.6	13.6	59.8	33.2	0.0	50.9	49.7	41.2	50.9
Incr Delay (d2), s/veh	0.4	74.6	76.1	81.8	1.2	1.2	79.1	0.3	0.0	13.6	20.8	0.1	13.6
Initial Q Delay(d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/h	0.3	30.7	30.7	27.8	8.9	9.0	8.4	5.8	0.0	9.8	14.6	0.9	9.8
nImp Delay(s)/veh	32.4	119.8	121.3	129.5	14.8	14.8	138.9	33.5	0.0	64.4	70.5	41.4	70.5
nImp LOS	C	F	F	F	B	B	F	C	E	E	D	D	E
Approach Vol, veh/h	1221				1447			358		627			627
Approach Delay, s/veh	119.8				57.4			76.8		66.7			66.7
Approach LOS	F				E			E		E			E
Inner	1	2	3	4	5	6	7	8					
Assgn Pkts	2	3	4	5	6	6	7	8					
Pkts Duration (G+V+Rc), s	47.0	39.0	44.0	15.0	32.0	83.0							
Change Period (V+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5							
Max Green Setting (Gmax), s	42.5	34.5	39.5	10.5	27.5	78.5							
Max Q Clear Time (g-clear), s	13.1	36.5	41.5	12.5	28.5	19.4							
Green Ext Time (p-c), s	4.9	0.0	0.0	0.0	0.0	0.0							

Assigned Phs

[illegible]

HCM 2010 TWSC 28: Trosper Rd & Rural Rd

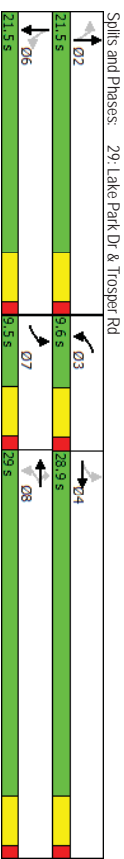
Projected 2040 No Build
PM Peak Hour

Intersection									
Int Delay, s/veh	9								
Movement	EBL	EBT	WBT	WBR	SBL	SBR			
Traffic Vol, veh/h	110	265	425	135	150	165			
Future Vol, veh/h	110	265	425	135	150	165			
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			
Vehicle in Median Storage, #	-	0	0	-	0	-			
Grade, %	-	0	0	-	0	-			
Peak Hour Factor	95	95	95	95	95	95			
Heavy Vehicles, %	0	0	1	1	2	2			
Wmtl Flow	116	279	447	142	158	174			
Major/Minor	Major1		Major2		Minor2				
Conflicting Flow All	589	0	-	0	1029	518			
Stage 1	-	-	-	-	511	-			
Stage 2	-	-	-	-	511	-			
Critical Hdwy	4.1	-	-	-	6.42	6.22			
Critical Hdwy Sig 1	-	-	-	-	5.42	-			
Critical Hdwy Sig 2	-	-	-	-	5.42	-			
Follow-up Hdwy	2.2	-	-	-	3.518	3.318			
Pot Cap-1 Maneuver	996	-	-	-	259	558			
Stage 1	-	-	-	-	598	-			
Stage 2	-	-	-	-	602	-			
Platoon blocked, %	-	-	-	-	-	-			
Max Cap-1 Maneuver	996	-	-	-	223	558			
Max Cap-2 Maneuver	-	-	-	-	223	-			
Stage 1	-	-	-	-	598	-			
Stage 2	-	-	-	-	519	-			
Approach	EB		WB		SB				
HCM Control Delay, s	2.7		0		32.6				
HCM LOS					D				
Minor Lane/Major Wmtl	EBL	EBT	WBT	WBR	SBL	SBR			
Capacity (veh/h)	996	-	-	223	558	-			
HCM Lane V/C Ratio	0.116	-	-	0.708	0.311	-			
HCM Control Delay (s)	9.1	0	-	52.7	14.3	-			
HCM Lane LOS	A	A	-	F	B	-			
HCM 95th %ile Q(veh)	0.4	-	-	4.6	1.3	-			

Lanes, Volumes, Timings 29: Lake Park Dr & Trosper Rd

Projected 2040 No Build
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	10	415	55	65	540	155	75	30	70	160	25	15
Future Volume (vph)	10	415	55	65	540	155	75	30	70	160	25	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	125	150	225	0	100	0	125	0	125	0	0	0
Storage Lanes	1	1	1	1	1	1	1	1	1	1	1	1
Taper Length (ft)	25	25	25	25	25	25	25	25	25	25	25	25
Right Turn on Red	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Link Speed (mph)	30	30	30	30	30	30	30	30	30	30	30	30
Link Distance (ft)	2012	45.7	652	14.8	269	6.1	269	6.1	269	6.1	269	6.1
Travel Time (s)	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Peak Hour Factor	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)	pm+pl	NA	pm+pl	NA	Perm	Perm	NA	Perm	NA	Perm	NA	Perm
Turn Type	7	4	3	8	8	2	2	2	2	6	6	6
Protected Phases	4	4	3	8	8	2	2	2	2	6	6	6
Permitted Phases	7	4	3	8	8	2	2	2	2	6	6	6
Detector Phase	7	4	3	8	8	2	2	2	2	6	6	6
Switch Phase	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Initial (s)	9.5	26.5	9.5	26.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5
Minimum Split (s)	9.5	28.9	9.6	29.0	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5
Total Split (%)	15.8%	48.2%	16.0%	48.3%	35.8%	35.8%	35.8%	35.8%	35.8%	35.8%	35.8%	35.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
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	4.5
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lag	Lag	Lag	Lag
Lead-Lag Optimizer?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	None	None	None	None	None
Intersection Summary												
Area Type:	Other											
Cycle Length:	60											
Actuated Cycle Length:	47.7											
Natural Cycle:	60											
Control Type:	Actuated-Uncoordinated											



HCM 2010 Signalized Intersection Summary 29: Lake Park Dr & Trosper Rd

Projected 2040 No Build
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (veh/h)	10	415	55	65	540	155	75	30	70	160	25	15
Future Volume (veh/h)	10	415	55	65	540	155	75	30	70	160	25	15
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Q ₀) veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped Bike Adj(A _{pb})	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/hln	1881	1881	1900	1881	1881	1881	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	11	437	58	68	568	163	79	32	74	168	26	16
Adj No of Lanes	1	2	0	1	1	1	1	1	0	1	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh. %	1	1	1	1	1	1	0	0	0	0	0	0
Cap. veh/h	261	1102	146	468	740	629	575	169	390	513	364	224
Arrive On Green	0.01	0.35	0.35	0.06	0.39	0.39	0.33	0.33	0.33	0.33	0.33	0.33
Sat Flow, veh/h	1792	3175	419	1792	1881	1599	1386	511	1181	1308	1102	678
Grip Volume(V _g) veh/h	11	245	250	68	568	163	79	0	106	168	0	42
Grip Sat Flow(s) veh/hln	1792	1787	1807	1792	1881	1599	1386	0	1692	1308	0	1780
Q Serve(g.s) s	0.2	5.3	5.4	1.2	13.5	3.5	2.1	0.0	2.3	5.4	0.0	0.8
Cycle Q Clear(g.c) s	0.2	5.3	5.4	1.2	13.5	3.5	3.0	0.0	2.3	7.7	0.0	0.8
Prop In Lane	1.00	0.23	1.00	1.00	1.00	1.00	1.00	0.70	1.00	1.00	0.38	0.38
Lane Grp Cap(c), veh/h	261	621	628	468	740	629	575	0	559	513	0	588
AVC Relat(X)	0.04	0.39	0.40	0.15	0.77	0.26	0.14	0.00	0.19	0.33	0.00	0.07
Avail Cap(c, a), veh/h	409	847	856	537	895	761	575	0	559	513	0	588
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(f)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	11.8	12.7	12.7	9.7	13.6	10.5	12.8	0.0	12.3	15.1	0.0	11.8
Incr Delay (d ₂), s/veh	0.1	0.4	0.4	0.1	3.3	0.2	0.5	0.0	0.8	1.7	0.0	0.2
Initial Q Delay(d ₀), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackQ(50%), veh/h	0.1	2.7	2.7	0.6	7.6	1.6	0.9	0.0	1.2	2.2	0.0	0.4
LnGrp Delay(d), s/veh	11.9	13.1	13.1	9.8	16.9	10.8	13.3	0.0	13.1	16.8	0.0	12.1
LnGrp LOS	B	B	B	A	B	B	B	B	B	B	B	B
Approach Vol, veh/h	506			799			185			210		
Approach Delay, s/veh	13.1			15.0			13.2			15.8		
Approach LOS	B			B			B			B		
Timer	1	2	3	4	5	6	7	8				
Assigned PIs	2	2	3	4	5	6	7	8				
Phs Duration (G+Y+R ₀), s	21.5	7.6	22.4	21.5	5.2	24.8						
Change Period (Y+R ₀), s	4.5	4.5	4.5	4.5	4.5	4.5						
Max Green Sating (G _{max}), s	17.0	5.1	24.4	17.0	5.0	24.5						
Max Q Clear Time (Q _{ch1}), s	5.0	3.2	7.4	9.7	2.2	15.5						
Green Ext Time (Q _{ch1}), s	1.3	0.0	7.0	1.0	0.0	4.8						
Intersection Summary												
HCM 2010 Crt Delay	14.4											
HCM 2010 LOS	B											

Lanes, Volumes, Timings 30: Littlerock Rd/2nd Ave & Trosper Rd

Projected 2040 No Build
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	85	435	175	430	365	20	325	415	475	165	490	110
Future Volume (vph)	85	435	175	430	365	20	325	415	475	165	490	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100	0	150	0	250	0	150	0	150	250	0	0
Storage Lanes	1	1	0	1	1	0	1	1	1	2	0	0
Taper Length (ft)	25			25			25			25		
Right Turn on Red												
Link Speed (mph)				30	Yes		30	Yes		30	Yes	
Link Distance (ft)				652			520			896		1861
Travel Time (s)				14.8			11.8			20.4		42.3
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	Split	NA	Split	Split	NA	Split	ProI	NA	pm+ov	ProI	NA	NA
Protected Phases	4	4	8	8	8	8	5	2	8	1	6	6
Permitted Phases												
Detector Phase	4	4	8	8	8	8	5	2	8	1	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Spill (s)	35.6	35.6	33.6	33.6	33.6	29.2	30.6	33.6	8.6	31.6		
Total Split (s)	35.6	35.6	33.6	33.6	33.6	29.2	42.5	33.6	18.3	31.6		
Total Split (%)	27.4%	27.4%	25.8%	25.8%	25.8%	22.5%	32.7%	25.8%	14.1%	24.3%		
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6		
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6		
Lead/Lag												
Lead/Lag Optimizer?												
Recall Mode	Max	Max	C-Max	C-Max	C-Max	Max	Max	Max	C-Max	None	Max	Max
Intersection Summary												
Area Type:	Other											
Cycle Length: 130												
Actuated Cycle Length: 130												
Offset: 126 (97%), Referenced to phase 8WBL, Start of Red												
Natural Cycle: 130												
Control Type: Actuated-Coordinated												
Spills and Phases: 30: Littlerock Rd/2nd Ave & Trosper Rd												
	102	18.3 s	35.6 s	35.6 s	35.6 s	35.6 s	35.6 s	35.6 s	35.6 s	35.6 s	35.6 s	35.6 s
	05	06	01	04	08 (R)							
	29.7 s	31.6 s										

HCM 2010 Signalized Intersection Summary 30: Litterock Rd/2nd Ave & Trospier Rd

Projected 2040 No Build
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	85	435	175	430	365	20	325	415	475	165	490	110
Future Volume (vph)	85	435	175	430	365	20	325	415	475	165	490	110
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Q ₀), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped Bike Adj(A _{pb})	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/hln	1881	1881	1900	1881	1881	1900	1881	1881	1881	1881	1900	1900
Adj Flow Rate, veh/h	89	458	121	286	618	21	342	437	379	174	516	116
Adj No of Lanes	1	2	0	1	2	0	1	1	1	1	2	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh. %	1	1	1	1	1	1	1	1	1	1	1	1
Cap. veh/h	427	668	175	400	807	27	339	548	823	189	603	135
Arrive On Green	0.24	0.24	0.24	0.37	0.37	0.37	0.19	0.29	0.29	0.11	0.21	0.21
Sat Flow, veh/h	1792	2803	735	1792	3618	123	1792	1881	1599	1792	2904	650
Grp Volume(V), veh/h	89	291	288	321	318	342	437	379	174	317	315	315
Grp Sat Flow(s), veh/hln	1792	1787	1751	1792	1881	1860	1792	1881	1599	1792	1787	1767
Q Serve(g.s), s	5.2	19.2	19.5	17.8	19.5	24.6	27.9	19.6	12.5	22.2	22.4	22.4
Cycle Q Clear(g.c), s	5.2	19.2	19.5	17.8	19.5	24.6	27.9	19.6	12.5	22.2	22.4	22.4
Prop In Lane	1.00	0.42	1.00	0.07	1.00	0.07	1.00	1.00	1.00	0.85	0.37	0.37
Lane Grp Cap(c), veh/h	427	426	418	400	420	415	339	548	823	189	371	367
W/C Ratio(X)	0.21	0.68	0.69	0.72	0.77	1.01	0.80	0.46	0.92	0.85	0.86	0.86
Avail Cap(c), veh/h	427	426	418	400	420	415	339	548	823	189	371	367
HCM Platoon Ratio	1.00	1.00	1.00	1.67	1.67	1.67	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(f)	0.92	0.92	0.92	0.72	0.72	0.72	0.79	0.79	0.79	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.7	45.0	45.1	37.3	37.8	52.7	42.5	20.1	57.6	49.6	49.7	49.7
Incr Delay (d ₂), s/veh	1.0	7.9	8.3	7.7	9.3	9.4	45.7	9.2	1.5	43.8	21.3	22.2
Initial Q Delay(d ₀), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackQ(50%), veh/h	2.7	10.5	10.4	9.6	11.2	11.1	16.5	15.9	13.0	8.5	13.1	13.2
LnGrp Delay(d), s/veh	40.7	52.9	53.5	47.1	47.2	98.4	51.7	21.5	101.4	70.9	71.9	71.9
LnGrp LOS	D	D	D	D	D	F	D	C	F	E	E	E
Approach Vol, veh/h	668			925			1158			806		
Approach Delay, s/veh	51.5			46.5			55.6			77.9		
Approach LOS	D			D			E			E		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6						
Phs Duration (G+Y+R ₀), s	18.3	42.5		35.6	29.2	31.6						
Change Period (Y+R ₀), s	4.6	4.6		4.6	4.6	4.6						
Max Green Setting (G _{max}), s	13.7	37.9		31.0	24.6	27.0						
Max Q Clear Time (G _{chl}), s	14.5	29.9		21.5	26.6	24.4						
Green Ext Time (G _{cl}), s	0.0	2.2		2.3	0.0	1.1						
Intersection Summary												
HCM 2010 Ctrl Delay	57.5											
HCM 2010 LOS	E											
Notes												

Lanes, Volumes, Timings 31: Tyee Dr/L-5 SB Ramps & Trospier Rd

Projected 2040 No Build
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	205	800	25	275	340	400	35	155	435	385	430	475
Future Volume (vph)	205	800	25	275	340	400	35	155	435	385	430	475
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200	100	100	275	0	75	125	400	400			
Storage Lanes	1	1	1	1	1	1	1	1	1			
Taper Length (ft)	25			25			25					
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		520			883			832			932	
Travel Time (s)		11.8			20.1			18.9			21.6	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	2%	2%	2%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	Prot	NA	Perm	Prot	NA	Split	NA	pl+ov	Split	NA	Perm	Perm
Protected Phases	7	4	4	3	8	2	2	2.3	6	6	6	6
Permitted Phases	7	4	4	3	8	2	2	2.3	6	6	6	6
Detector Phase	7	4	4	3	8	2	2	2.3	6	6	6	6
Switch Phase												
Minimum Initial (s)	4.0	10.0	10.0	4.0	10.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Spill (s)	8.6	33.6	33.6	8.6	29.6	20.5	20.5	36.6	36.6	36.6	36.6	36.6
Total Spill (s)	25.0	41.0	41.0	28.0	44.0	22.0	22.0	39.0	39.0	39.0	39.0	39.0
Total Split (%)	19.2%	31.5%	31.5%	21.5%	33.8%	16.9%	16.9%	30.0%	30.0%	30.0%	30.0%	30.0%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Lead/Lag	Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lead	Lead	Lead	Lead
Lead-Lag Optimizer?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	Max	Max	Max	Max	Max	Max	Max
Intersection Summary												
Area Type:	Other											
Cycle Length: 130												
Actuated Cycle Length: 130												
Offset: 118 (97%), Referenced to phase 4:EBT and 8:WBT, Start of Red												
Natural Cycle: 110												
Control Type: Actuated-Coordinated												
Spills and Phases: 31: Tyee Dr/L-5 SB Ramps & Trospier Rd												
	22 s	39 s	06	28 s	03	04 (R)	41 s	07	25 s	07	25 s	07
	02	06	03	03	03	03	03	03	03	03	03	03

HCM 2010 Signalized Intersection Summary 31: Tyee Dr/I-5 SB Ramps & Trosper Rd

Projected 2040 No Build
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	1	1	1	1	1	1	1	1	1	1	1	1
Traffic Volume (veh/h)	205	800	25	275	340	400	35	155	435	385	430	475
Future Volume (veh/h)	205	800	25	275	340	400	35	155	435	385	430	475
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped Bike Adj(A_pb7)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/hln	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881
Adj Flow Rate, veh/h	216	842	26	289	358	0	37	163	405	405	453	184
Adj No of Lanes	1	2	1	1	2	0	1	1	1	2	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh. %	1	1	1	1	1	1	2	2	2	1	1	1
Cap. veh/h	281	1020	456	313	1083	0	237	249	489	616	498	423
Arrive On Green	0.31	0.57	0.17	0.17	0.30	0.00	0.13	0.13	0.13	0.26	0.26	0.26
Sat Flow, veh/h	1792	3574	1599	1792	3668	0	1774	1863	1583	2329	1881	1599
Gp Volume(V), veh/h	216	842	26	289	358	0	37	163	405	405	453	184
Gp Sat Flow(s), veh/hln	1792	1787	1599	1792	1787	0	1774	1863	1583	1165	1881	1599
Q Serve(g.s), s	14.2	24.9	0.9	20.6	10.1	0.0	2.4	10.8	17.4	20.1	30.3	12.4
Cycle Q Clear(g.c), s	14.2	24.9	0.9	20.6	10.1	0.0	2.4	10.8	17.4	20.1	30.3	12.4
Prop In Lane	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Gp Cap(c), veh/h	281	1020	456	313	1083	0	237	249	489	616	498	423
V/C Ratio(X)	0.77	0.83	0.06	0.92	0.33	0.00	0.16	0.65	0.83	0.66	0.91	0.43
Avail Cap(c), veh/h	281	1020	456	322	1083	0	237	249	489	616	498	423
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(f)	0.65	0.65	0.65	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay(d), s/veh	42.5	25.3	20.2	52.8	35.1	0.0	49.8	53.4	41.8	42.6	46.3	39.7
Incrt Delay(d2), s/veh	8.2	5.1	0.2	30.7	0.8	0.0	1.4	12.6	14.9	5.4	23.2	3.2
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackQ(50%), veh/h	7.6	12.9	0.4	12.9	5.1	0.0	1.3	6.4	15.5	6.9	18.9	5.9
Lngrp Delay(d), s/veh	50.6	30.4	20.3	83.5	35.9	0.0	51.2	66.1	56.7	48.0	69.5	43.0
Lngrp LOS	D	C	C	F	D	D	D	E	E	D	E	D
Approach Vol, veh/h	1084			647			605			1042		
Approach Delay, s/veh	34.2			57.2			58.9			56.5		
Approach LOS	C			E			E			E		
Timer	1	2	3	4	5	6	7	8				
Assigned Pks	2	2	3	4	6	7	8					
Pks Duration (G+Y+R), s	22.0	27.3	41.7	39.0	25.0	44.0						
Change Period (Y+R), s	4.6	4.6	4.6	4.6	4.6	4.6						
Max Green Setting (Gmax), s	17.4	23.4	36.4	34.4	20.4	39.4						
Max Q Clear Time (G+ch1), s	19.4	22.6	26.9	32.3	16.2	12.1						
Green Ext Time (p-c), s	0.0	0.1	4.2	1.2	2.3	2.4						
Intersection Summary												
HCM 2010 Crt Delay	499											
HCM 2010 LOS	D											

HCM 2010 TWSC 32: I-5 NB Ramps & Trosper Rd

Projected 2040 No Build
PM Peak Hour

Intersection	1.2											
Int Delay, s/veh												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SEL	SER		
Traffic Vol, veh/h	0	1030	665	0	1015	410	0	145	0	0		
Future Vol, veh/h	0	1030	665	0	1015	410	0	145	0	0		
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0		
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop		
RT Channelized	-	-	Free	-	-	Free	-	-	Yield	-		
Storage Length	300	-	-	-	-	-	-	-	-	-		
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-		
Grade, %	-	0	-	-	0	-	-	0	-	-		
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95		
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1		
Mmnt Flow	0	1084	700	0	1068	432	0	153	0	0		

Major/Minor	Major1	Major2	Minor1	
Conflicting Flow All	-	-	-	542
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	-	-	7.12
Critical Hdwy Sig 1	-	-	-	-
Critical Hdwy Sig 2	-	-	-	-
Follow-up Hdwy	-	-	-	3.91
Pot Cap-1 Maneuver	0	0	0	417
Stage 1	0	0	0	0
Platoon blocked, %	0	0	0	-
Mov Cap-1 Maneuver	-	-	-	417
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Approach	EB	WB	NB	
HCM Control Delay, s	0	0	18.5	
HCM LOS			C	
Minor Lane/Minor Mmnt	NBLn1	EBT	WBT	
Capacity (veh/h)	417	-	-	
HCM Lane V/C Ratio	0.366	-	-	
HCM Control Delay (s)	18.5	-	-	
HCM Lane LOS	C	-	-	
HCM 95th %ile Q(veh)	1.6	-	-	

Lanes, Volumes, Timings

33: Capitol Blvd & Trosper Rd

Projected 2040 No Build
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	595	65	460	50	250	50	690	770	10	35	985	650
Future Volume (vph)	595	65	460	50	250	50	690	770	10	35	985	650
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0	50	0	250	0	250	0	100	200	200
Storage Lanes	1	1	1	1	1	1	0	1	0	1	1	1
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes		Yes			Yes			Yes	
Link Speed (mph)	30			30			30			30		
Link Distance (ft)	397			338			735			2664		
Travel Time (s)	9.0			7.7			16.7			60.5		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)	45%						31%					
Turn Type	Split	NA	pm+ov	Split	NA		Split	NA		Split	NA	Perm
Protected Phases	4	4	2	8	8		2	2		6	6	6
Detector Phase	4	4	2	8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
Minimum Spill (s)	200	20.0	200	20.0	200		20.0	200		20.0	200	200
Total Split (s)	27.0	27.0	49.0	21.0	21.0		49.0	49.0		33.0	33.0	33.0
Total Spill (%)	20.8%	20.8%	37.7%	16.2%	16.2%		37.7%	37.7%		25.4%	25.4%	25.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5		0.5	0.5		0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lead/Lag												
Lead/Lag Optimizer?												
Recall Mode	None	None	C-Min	None	None		C-Min	C-Min		Min	Min	Min
Intersection Summary												
Area Type:	Other											
Cycle Length: 130												
Actuated Cycle Length: 130												
Offset: 0 (0%), Referenced to phase 2, NBT, Start of Green, Master Intersection												
Natural Cycle: 150												
Control Type: Actuated-Coordinated												

Spills and Phases: 33: Capitol Blvd & Trosper Rd

02 (R)	06	04	08
33 s	27 s	21 s	

HCM 2010 Signalized Intersection Summary

33: Capitol Blvd & Trosper Rd

Projected 2040 No Build
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	595	65	460	50	250	50	690	770	10	35	985	650
Future Volume (veh/h)	595	65	460	50	250	50	690	770	10	35	985	650
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Ob), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped Bike Adj (A _{pb})	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/hln	1881	1881	1881	1900	1900	1900	1881	1881	1900	1881	1881	1881
Adj Flow Rate, veh/h	675	0	247	53	263	53	516	1105	11	37	1037	0
Adj No of Lanes	2	0	1	1	1	0	1	2	0	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh. %	1	1	1	0	0	0	1	1	1	1	1	1
Cap. veh/h	634	0	836	237	201	40	620	1287	13	400	797	357
Arrive On Green	0.24	0.00	0.24	0.13	0.13	0.13	0.11	0.11	0.11	0.22	0.22	0.00
Sat Flow veh/h	3583	0	1599	1810	1536	310	1792	3719	37	1792	3574	1599
Gp Volume(v), veh/h	675	0	247	53	0	316	516	559	557	37	1037	0
Gp Sat Flow(s), veh/hln	1792	0	1599	1810	0	1845	1792	1881	1875	1792	1787	1599
Q Serve(g.s), s	230	0.0	11.2	3.4	0.0	17.0	36.6	37.9	37.9	2.1	29.0	0.0
Cycle Q Clear(g.c), s	230	0.0	11.2	3.4	0.0	17.0	36.6	37.9	37.9	2.1	29.0	0.0
Prop In Lane	1.00		1.00	1.00		0.17	1.00	0.02	1.00		1.00	
Lane Grp Cap(c), veh/h	634	0	836	237	0	241	620	651	649	400	797	357
Avl Ratio(X)	1.06	0.00	0.30	0.22	0.00	1.31	0.83	0.86	0.86	0.09	1.30	0.00
Avl Cap(C,a), veh/h	634	0	836	237	0	241	620	651	649	400	797	357
HCM Platoon Ratio	1.33	1.33	1.33	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(f)	1.00	0.00	1.00	1.00	0.00	1.00	0.79	0.79	0.79	0.17	0.17	0.00
Uniform Delay (d), s/veh	497	0.0	16.2	50.6	0.0	56.5	53.9	54.4	54.4	40.1	50.5	0.0
Incr Delay (d2), s/veh	54.2	0.0	0.2	0.5	0.0	16.58	10.0	11.2	11.2	0.0	136.9	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackQ(50%), veh/h	16.1	0.0	8.6	17	0.0	19.8	19.9	21.8	21.7	1.1	29.4	0.0
LnGrp Delay(d), s/veh	1039	0.0	16.4	51.1	0.0	222.3	63.8	65.6	65.7	40.1	187.4	0.0
LnGrp LOS	F		B	D		F	E	E	E	D	F	
Approach Vol, veh/h	922			369			1632			1074		
Approach Delay, s/veh	805			197.7			65.1			182.3		
Approach LOS	F			F			E			F		
Timer	1	2	3	4	5	6	7	8				
Assigned Pts		2		4		6		8				
Pts Duration (G+Y+Rc), s		49.0		27.0		33.0		21.0				
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0				
Max Green Setting (Gmax), s		45.0		23.0		29.0		17.0				
Max O Clear Time (G+Y+Rc), s		39.9		25.0		31.0		19.0				
Green Ext Time (P.C.), s		3.6		0.0		0.0		0.0				
Intersection Summary												
HCM 2010 Cnt Delay	112.4											
HCM 2010 LOS	F											
Notes												

Lanes, Volumes, Timings

Projected 2040 No Build PM Peak Hour

34: Capitol Blvd & Lee St

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4	7	1			1	4		1	4	
Traffic Volume (vph)	240	15	95	15	10	85	195	1160	20	70	1270	120
Future Volume (vph)	240	15	95	15	10	85	195	1160	20	70	1270	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		125	0		100	250	0		200	0	0
Storage Lanes	0		1	1		0	1	0		1	0	0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)	30			30			30			30		
Link Distance (ft)	718			814			621			735		
Travel Time (s)	16.3			18.5			14.1			16.7		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Prot	NA	
Protected Phases	4	4	8	8	8	5	2	1	6			
Permitted Phases	4	4	4	8	8	5	2	1	6			
Detector Phase	4	4	4	8	8	5	2	1	6			
Switch Phase												
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0	6.0	12.0	6.0	12.0	6.0	12.0	6.0
Minimum Spill (s)	29.0	29.0	29.0	30.0	30.0	30.0	11.0	25.0	11.0	25.0	11.0	25.0
Total Split (s)	41.0	41.0	41.0	41.0	41.0	41.0	23.0	73.0	23.0	73.0	23.0	73.0
Total Split (%)	31.5%	31.5%	31.5%	31.5%	31.5%	31.5%	17.7%	56.2%	12.3%	50.8%	12.3%	50.8%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Lead/Lag							Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	None	C-Max	None	C-Max
Intersection Summary												
Area Type:	Other											
Cycle Length: 130												
Actuated Cycle Length: 130												
Offset: 116 (89%), Referenced to phase 2/NBT and 6/SBT Start of Red												
Natural Cycle: 90												
Control Type: Actuated-Coordinated												
Spills and Phases: 34: Capitol Blvd & Lee St												
01	02 (R)								04			
06 (R)												
05												
08												
16 s	73 s						41 s					
16 s												

HCM Signalized Intersection Capacity Analysis

Projected 2040 No Build PM Peak Hour

34: Capitol Blvd & Lee St

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	240	15	95	15	10	85	195	1160	20	70	1270	120
Future Volume (vph)	240	15	95	15	10	85	195	1160	20	70	1270	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total lost time (s)	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00	0.95
Fit	1.00	0.85	1.00	0.87	1.00	1.00	1.00	1.00	0.99	1.00	0.99	1.00
Fit Protected	0.96	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Satd Flow (vph)	1797	1599	1805	1646	1797	1599	1787	3565	1787	3528	1787	3528
Fit Permitted	0.64	1.00	0.36	1.00			0.95	1.00		0.95	1.00	
Satd Flow (vph)	1208	1599	675	1646			1787	3565		1787	3528	
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)	253	16	100	16	11	89	205	1221	21	74	1337	126
RTOR Reduction (vph)	0	0	69	0	67	0	0	1	0	0	5	0
Lane Group Flow (vph)	0	269	31	16	33	0	205	1241	0	74	1458	0
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Prot	NA	Prot	NA	NA
Protected Phases	4	4	8	8	5	2	1	6				
Permitted Phases	4	4	8	8	5	2	1	6				
Actuated Green, G (s)	31.6	31.6	31.6	31.6	19.3	76.7	7.9	65.3				
Effective Green, g (s)	31.6	31.6	31.6	31.6	19.3	76.7	7.9	65.3				
Actuated g/C Ratio	0.24	0.24	0.24	0.24	0.15	0.59	0.06	0.50				
Clearance Time (s)	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6				
Vehicle Extension (s)	2.0	2.0	2.0	2.0	1.5	3.0	1.6	3.0				
Lane Grp Cap (vph)	293	388	164	400	265	2103	108	1772				
W/S Ratio Prot				0.02			c0.11	0.35				
W/S Ratio Perm	c0.22	0.02	0.02									
U/C Ratio	0.92	0.08	0.10	0.08	0.77	0.59	0.69	0.82				
Uniform Delay, d1	47.9	38.0	38.1	38.0	53.2	16.8	59.8	27.4				
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.43	0.37				
Incremental Delay, d2	31.2	0.0	0.1	0.0	12.0	1.2	1.3	0.4				
Delay (s)	79.2	38.0	38.2	38.0	65.3	18.0	87.0	10.7				
Level of Service	E	D	D	D	E	B	F	B				
Approach Delay (s)	68.0			38.1			24.7					
Approach LOS	E			D			C					
Intersection Summary												
HCM 2000 Control Delay	25.2											
HCM 2000 Volume to Capacity ratio	0.84											
Actuated Cycle Length (s)	130.0											
Intersection Capacity Utilization	82.0%											
Analysis Period (min)	15											
C Critical Lane Group												

Lanes, Volumes, Timings

Projected 2040 No Build
PM Peak Hour

35: Litterlock Rd & Fred Meyer/Costco Drwy

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	140	5	135	0	1040	105	105	965	0
Future Volume (vph)	0	0	0	140	5	135	0	1040	105	105	965	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	0
Storage Length (ft)	0	0	0	0	0	100	0	175	0	175	0	0
Storage Lanes	0	0	1	0	1	1	1	0	1	1	0	0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes		Yes			Yes			Yes	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		390			426			713			896	
Travel Time (s)		8.9			9.7			16.2			20.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type		Perm	Perm	NA	pm+ov	Prot	NA	pm+pl	NA		NA	
Permitted Phases		4	4	8	8	1	5	2		1	6	
Detector Phase	4	4	4	8	8	1	5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Spill (s)	200	200	200	200	200	9.0	9.0	200	9.0	20.0	20.0	20.0
Total Split (s)	200	200	200	200	200	9.0	9.0	260	9.0	26.0	26.0	26.0
Total Split (%)	36.4%	36.4%	36.4%	36.4%	36.4%	16.4%	16.4%	47.3%	16.4%	47.3%	47.3%	47.3%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
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	4.0
Lead/Lag						Lead		Lag		Lead		Lag
Lead-Lag Optimizer?						Yes		Yes		Yes		Yes
Recall Mode	None	None	None	None	None	None	None	Max		None	Max	
Intersection Summary												
Area Type:	Other											
Cycle Length:	55											
Actuated Cycle Length:	48.2											
Natural Cycle:	55											
Control Type:	Actuated-Uncoordinated											

Splits and Phases: 35: Litterlock Rd & Fred Meyer/Costco Drwy



HCM 2010 Signalized Intersection Summary

Projected 2040 No Build
PM Peak Hour

35: Litterlock Rd & Fred Meyer/Costco Drwy

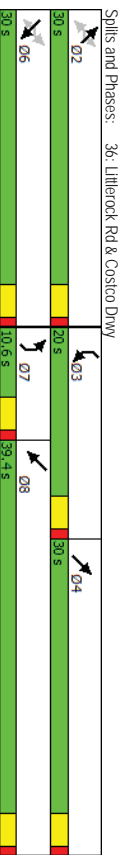
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	140	5	135	0	1040	105	105	965	0
Future Volume (veh/h)	0	0	0	140	5	135	0	1040	105	105	965	0
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Ob), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped/Bike Adj (pbt)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/hln	1900	1900	1900	1900	1881	1881	1881	1881	1900	1881	1881	1900
Adj Flow Rate, veh/h	0	0	0	147	5	142	0	1095	111	111	1016	0
Adj No of Lanes	0	1	1	0	1	1	1	2	0	1	2	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh. %	0	0	0	1	1	1	1	1	1	1	1	1
Cap. veh/h	0	291	247	372	7	379	4	1618	164	423	2385	0
Arrive On Green	0.00	0.00	0.00	0.15	0.15	0.15	0.00	0.49	0.49	0.08	0.67	0.00
Sat Flow, veh/h	0	1900	1615	1390	47	1599	1792	3278	332	1792	3668	0
Gp Volume(v), veh/h	0	0	0	152	0	142	0	597	609	111	1016	0
Gp Sat Flow(s), veh/hln	0	1900	1615	1437	0	1599	1792	1787	1823	1792	1787	0
Q SatFlow (s), s	0.0	0.0	0.0	4.5	0.0	3.3	0.0	11.3	11.3	1.1	5.9	0.0
Cycle Q Clear(g, c), s	0.0	0.0	0.0	4.5	0.0	3.3	0.0	11.3	11.3	1.1	5.9	0.0
Prop In Lane	0.00	1.00	1.00	0.97	1.00	1.00	1.00	0.18	1.00	1.00	0.00	0.00
Lane Gp Cap(c), veh/h	0	291	247	379	0	379	4	882	900	423	2385	0
AVC Ratio(X)	0.00	0.00	0.00	0.40	0.00	0.37	0.00	0.68	0.68	0.26	0.43	0.00
Avail Cap(C-a), veh/h	0	682	580	675	0	708	201	882	900	474	2385	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(f)	0.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	17.9	0.0	14.2	0.0	8.6	8.6	6.0	3.4	0.0
Incrt Delay (d2), s/veh	0.0	0.0	0.0	0.3	0.0	0.2	0.0	4.1	4.1	0.2	0.6	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackQ(50%), veh/hln	0.0	0.0	0.0	1.8	0.0	1.5	0.0	6.5	6.6	0.6	3.0	0.0
LnGp Delay(d), s/veh	0.0	0.0	0.0	18.1	0.0	14.5	0.0	12.7	12.7	6.2	4.0	0.0
LnGp LOS				B		B		B		A		A
Approach Vol, veh/h	0			294			1206			1127		
Approach Delay, s/veh	0.0			16.4			12.7			4.2		
Approach LOS				B			B			A		
Timer	1	2	3	4	5	6	7	8				
Assigned Pns	1	2		4	5	6		8				
Pns Duration (G+Y+Rc), s	7.7	26.0		10.8	0.0	33.7		10.8				
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0				
Max Green Setting (Gmax), s	5.0	22.0		16.0	5.0	22.0		16.0				
Max Q Clear Time (q-c+1), s	3.1	13.3		0.0	0.0	7.9		6.5				
Green Ext Time (p-c), s	0.0	6.9		0.0	0.0	10.3		0.5				
Intersection Summary												
HCM 2010 Crt Delay	9.5											
HCM 2010 LOS	A											

Lanes, Volumes, Timings

36: Litterlock Rd & Costco Drwy

Projected 2040 No Build
PM Peak Hour

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	100	30	20	95	5	260	65	825	145	265	735	100
Future Volume (vph)	100	30	20	95	5	260	65	825	145	265	735	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	100	0	100	0	100	150	0	150	0	150	0
Storage Length (ft)	0	1	1	0	1	1	1	0	1	1	1	0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes		Yes			Yes	
Link Speed (mph)	30				30			30			30	
Link Distance (ft)	325				608			995			713	
Travel Time (s)	7.4				13.8			22.6			16.2	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA		Prot	NA	
Permitted Phases	6	6	6	2	2	2	7	4		3	8	
Detector Phase	6	6	6	2	2	2	7	4		3	8	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Spill (s)	300	300	300	300	300	300	9.5	300		9.5	300	
Total Spill (s)	300	300	300	300	300	300	10.6	300		200	39.4	
Total Split (%)	37.5%	37.5%	37.5%	37.5%	37.5%	37.5%	13.3%	37.5%		25.0%	49.3%	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Allied Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.0			4.0			4.0			4.0		
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Recall Mode	Max	Max	Max	Max	Max	Max	None	None		None	None	
Intersection Summary												
Area Type:	Other											
Cycle Length: 80												
Actuated Cycle Length: 78.3												
Natural Cycle: 80												
Control Type: Actuated-Uncoordinated												



HCM Signalized Intersection Capacity Analysis

36: Litterlock Rd & Costco Drwy

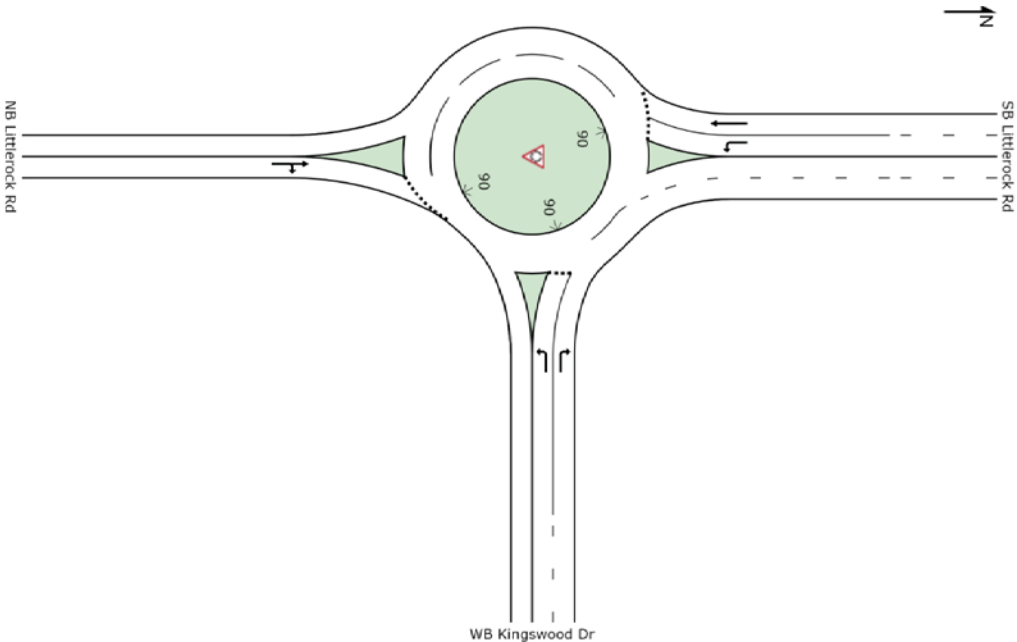
Projected 2040 No Build
PM Peak Hour

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	100	30	20	95	5	260	65	825	145	265	735	1000
Future Volume (vph)	100	30	20	95	5	260	65	825	145	265	735	1000
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	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00	0.95
Fit	1.00	0.85	1.00	1.00	0.85	1.00	0.98	1.00	0.98	1.00	0.98	1.00
Fit Protected	0.96	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Satd Flow (prot)	1830	1615	1814	1615	1787	3494	1787	3494	1787	3510	1787	3510
Fit Permitted	0.73	1.00	0.67	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Satd Flow (perm)	1389	1615	1278	1615	1787	3494	1787	3510	1787	3510	1787	3510
Pk-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)	105	32	21	100	5	274	68	868	153	279	774	1050
RTOR Reduction (vph)	0	0	14	0	0	184	0	18	0	0	13	0
Lane Group Flow (vph)	0	137	7	0	105	90	68	1003	0	279	866	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases												
Permitted Phases	6	6	2	2	2	7	4			3	8	
Actuated Green, G (s)	26.0	26.0	26.0	26.0	26.0	5.2	26.1	15.0	35.9			
Effective Green, g (s)	26.0	26.0	26.0	26.0	26.0	5.2	26.1	15.0	35.9			
Actuated g/C Ratio	0.33	0.33	0.33	0.33	0.33	0.07	0.33	0.19	0.45			
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	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	3.0
Lane Grp Cap (vph)	456	530	420	530	117	1152	338	1593				
v/s Ratio Prot						0.04	c0.29	c0.16	0.25			
v/s Ratio Perm	c0.10	0.00	0.08	0.06								
v/c Ratio	0.30	0.07	0.25	0.17	0.88	0.87	0.83	0.54				
Uniform Delay, d1	19.8	17.9	19.4	18.9	35.9	24.9	30.8	15.7				
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
Incremental Delay, d2	1.7	0.0	1.4	0.7	7.2	7.4	15.0	0.4				
Delay (s)	21.5	17.9	20.8	19.6	43.1	32.3	45.8	16.0				
Level of Service	C	B	C	B	D	C	D	B				
Approach Delay (s)	210		199		330		232					
Approach LOS	C		B		C		C					
Intersection Summary												
HCM 2000 Control Delay	26.5	HCM 2000 Level of Service										C
HCM 2000 Volume to Capacity ratio	0.64											
Actuated Cycle Length (s)	79.1	Sum of lost time (s)										12.0
Intersection Capacity Utilization	65.9%	ICU Level of Service										C
Analysis Period (min)	15											
Critical Lane Group												

SITE LAYOUT

Site: 37) Littlerock Rd at Kingswood Dr

Projected 2040 Baseline
PM Peak Hour
Roundabout



MOVEMENT SUMMARY

Site: 37) Littlerock Rd at Kingswood Dr

Projected 2040 Baseline
PM Peak Hour
Roundabout

Movement Performance - Vehicles									
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. of Satm w/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance ft	Prop. Queued
South: NB Littlerock Rd									
8	T1	895	1.0	1.009	22.0	LOS F	48.8	1229.0	1.00
18	R2	168	1.0	1.009	21.9	LOS F	48.8	1229.0	1.00
Approach		1063	1.0	1.009	22.0	LOS C	48.8	1229.0	1.00
East: WB Kingswood Dr									
1	L2	195	1.0	0.364	16.1	LOS B	3.0	75.4	0.99
16	R2	111	1.0	0.067	4.2	LOS A	0.0	0.0	0.00
Approach		305	1.0	0.364	11.8	LOS B	3.0	75.4	0.63
North: SB Littlerock Rd									
7	L2	95	1.0	0.123	11.4	LOS B	0.7	17.4	0.48
4	T1	837	1.0	0.684	5.7	LOS A	7.7	195.2	0.75
Approach		932	1.0	0.684	6.3	LOS A	7.7	195.2	0.73
All Vehicles		2300	1.0	1.009	14.3	LOS B	48.8	1229.0	0.84
									0.71
									31.8

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if $v/c > 1$ irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akecik M2D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

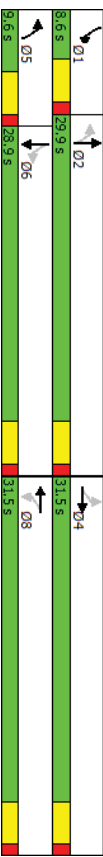
Lanes, Volumes, Timings

Projected 2040 No Build
PM Peak Hour

38: Capitol Blvd & X St

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	30	1	20	35	1	20	25	1190	20	35	1190	50
Future Volume (vph)	30	1	20	35	1	20	25	1190	20	35	1190	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100	0	100	0	150	0	250	0	250	0	250	0
Storage Lanes	1	0	1	1	0	1	1	0	1	1	0	0
Taper Length (ft)	25	0	25	0	25	0	25	0	25	0	25	0
Right Turn on Red	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Link Speed (mph)	30	30	30	30	30	30	30	30	30	30	30	30
Link Distance (ft)	642	642	642	1326	1326	1326	1300	1300	1368	1368	1368	1368
Travel Time (s)	14.6	14.6	14.6	30.1	30.1	30.1	29.5	29.5	31.1	31.1	31.1	31.1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)	Perm	NA	Perm	NA	pm+pl	NA	pm+pl	NA	pm+pl	NA	pm+pl	NA
Turn Type	Perm	NA	Perm	NA	pm+pl	NA	pm+pl	NA	pm+pl	NA	pm+pl	NA
Permitted Phases	4	4	8	8	8	5	2	6	6	6	6	6
Detector Phase	4	4	8	8	8	5	2	6	6	6	6	6
Switch Phase	6.0	6.0	6.0	6.0	6.0	4.0	7.0	4.0	7.0	4.0	7.0	7.0
Minimum Initial (s)	31.5	31.5	31.5	31.5	31.5	9.5	25.5	8.5	26.5	8.5	26.5	26.5
Minimum Spill (s)	31.5	31.5	31.5	31.5	31.5	9.6	29.9	8.6	28.9	8.6	28.9	28.9
Total Spill (s)	45.0%	45.0%	45.0%	45.0%	45.0%	13.7%	42.7%	12.3%	41.3%	12.3%	41.3%	41.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
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	4.5
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimizer?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	None	None	None	None	None
Area Type:	Other	Other	Other	Other	Other	Other	Other	Other	Other	Other	Other	Other
Cycle Length:	70	70	70	70	70	70	70	70	70	70	70	70
Actuated Cycle Length:	46	46	46	46	46	46	46	46	46	46	46	46
Natural Cycle:	75	75	75	75	75	75	75	75	75	75	75	75
Control Type:	Actuated-Uncoordinated	Actuated-Uncoordinated	Actuated-Uncoordinated	Actuated-Uncoordinated	Actuated-Uncoordinated	Actuated-Uncoordinated	Actuated-Uncoordinated	Actuated-Uncoordinated	Actuated-Uncoordinated	Actuated-Uncoordinated	Actuated-Uncoordinated	Actuated-Uncoordinated

Splits and Phases: 38: Capitol Blvd & X St



HCM 2010 Signalized Intersection Summary

Projected 2040 No Build
PM Peak Hour

38: Capitol Blvd & X St

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (veh/h)	30	1	20	35	1	20	25	1190	20	35	1190	50
Future Volume (veh/h)	30	1	20	35	1	20	25	1190	20	35	1190	50
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Obs) veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped Bike Adj (Adj)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/hln	1900	1900	1900	1900	1900	1900	1881	1881	1900	1881	1881	1900
Adj Flow Rate, veh/h	32	1	21	37	1	21	26	1253	21	37	1253	53
Adj No of Lanes	1	1	1	1	1	1	1	2	1	1	2	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh. %	0	0	0	0	0	0	1	1	1	1	1	1
Arrive On Green	0.10	0.10	0.10	0.10	0.10	0.10	0.02	0.57	0.57	0.03	0.57	0.57
Sat Flow, veh/h	1412	74	1552	1412	74	1552	1792	3597	60	1792	3495	148
Gp Volume(v), veh/h	32	0	22	37	0	22	26	622	37	640	666	666
Gp Sat Flow(s), veh/hln	1412	0	1626	1412	0	1626	1792	1871	1792	1787	1871	1855
Q Serve(g.s), s	0.9	0.0	0.6	1.1	0.0	0.6	0.3	10.4	10.4	0.4	10.7	10.7
Cycle Q Clear(g.c), s	1.5	0.0	0.6	1.7	0.0	0.6	0.3	10.4	10.4	0.4	10.7	10.7
Prop In Lane	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.03	1.00	0.03	1.00	0.08
Lane Gp Cap(c), veh/h	285	0	164	285	0	164	347	1011	1058	365	1025	1064
Avl Ratio(X)	0.11	0.00	0.13	0.13	0.00	0.13	0.08	0.62	0.62	0.10	0.62	0.63
Avl Cap(C-a), veh/h	992	0	978	992	0	978	506	1011	1058	469	1025	1064
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(f)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.1	0.0	18.4	19.2	0.0	18.4	5.1	6.5	6.5	5.0	6.4	6.4
Incr Delay (d2), s/veh	0.2	0.0	0.4	0.2	0.0	0.4	0.1	2.8	2.7	0.1	2.9	2.8
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackQ(50%), veh/h	0.4	0.0	0.3	0.4	0.0	0.3	0.1	5.8	6.0	0.2	6.0	6.2
LnGrp Delay(d), s/veh	19.3	0.0	18.8	19.4	0.0	18.8	5.2	9.3	9.2	5.1	9.2	9.1
LnGrp LOS	B	B	B	B	B	B	A	A	A	A	A	A
Approach Vol, veh/h	54	54	54	59	59	59	1300	1300	1300	1343	1343	1343
Approach Delay, s/veh	19.1	19.1	19.1	19.1	19.1	19.1	9.2	9.2	9.2	9.1	9.1	9.1
Approach LOS	B	B	B	B	B	B	A	A	A	A	A	A
Timer	1	2	3	4	5	6	7	8	8	8	8	8
Assigned Pns	1	2	3	4	5	6	7	8	8	8	8	8
Pns Duration (G+Y+Rc), s	6.0	29.9	9.0	5.6	30.3	9.0	9.0	9.0	9.0	9.0	9.0	9.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	4.1	25.4	27.0	5.1	24.4	27.0	27.0	27.0	27.0	27.0	27.0	27.0
Max Q Clear Time (q-c+1), s	2.4	12.4	3.5	2.3	12.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Green Ext Time (p.c.), s	0.0	11.3	0.4	0.0	10.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Intersection Summary												
HCM 2010 Ctrl Delay	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5
HCM 2010 LOS	A	A	A	A	A	A	A	A	A	A	A	A

HCM 2010 TWSC 39: Elm St & X St

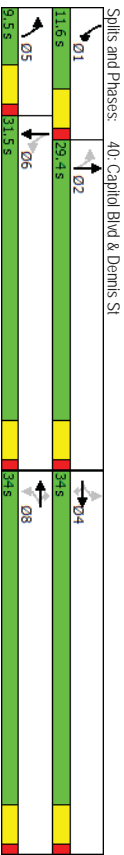
Projected 2040 No Build
PM Peak Hour

Intersection													
Int Delay, s/veh	2.3												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Traffic Vol, veh/h	10	15	10	5	5	5	5	90	10	0	60	5	
Future Vol, veh/h	10	15	10	5	5	5	5	90	10	0	60	5	
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	95	95	95	95	95	95	95	95	95	95	95	95	
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	2	2	2	
Mvmt Flow	11	16	11	5	5	5	5	95	11	0	63	5	
Major/Minor	Minor2			Minor1			Major1			Major2			
Conflicting Flow All	182	182	66	190	179	100	68	0	0	105	0	0	
Stage 1	66	66	-	111	111	-	-	-	-	-	-	-	
Stage 2	116	116	-	79	68	-	-	-	-	-	-	-	
Critical Hdwy Sig 1	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.12	-	-	
Critical Hdwy Sig 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-	
Critical Hdwy Sig 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-	
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.218	-	-	
Poi Cap-1 Maneuver	784	716	1003	774	718	961	1546	-	-	1486	-	-	
Stage 1	950	844	-	899	807	-	-	-	-	-	-	-	
Stage 2	894	803	-	935	842	-	-	-	-	-	-	-	
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-	
Max Cap-1 Maneuver	774	714	1003	751	716	961	1546	-	-	1486	-	-	
Max Cap-2 Maneuver	774	714	-	751	716	-	-	-	-	-	-	-	
Stage 1	947	844	-	896	805	-	-	-	-	-	-	-	
Stage 2	881	801	-	908	842	-	-	-	-	-	-	-	
Approach	EB			WB			NB			SB			
HCM Control Delay, s	9.7	-	-	9.6	-	-	0.3	-	-	0	-	-	
HCM LOS	A	-	-	A	-	-	-	-	-	-	-	-	
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBL	EBT	EBR	SBL	SBT	SBR				
Capacity (veh/h)	1546	-	-	797	796	1486	-	-	-				
HCM Lane V/C Ratio	0.003	-	-	0.046	0.02	-	-	-	-				
HCM Control Delay (s)	7.3	0	-	9.7	9.6	0	-	-	-				
HCM Lane LOS	A	A	-	A	A	-	-	-	-				
HCM 95th %ile Q(veh)	0	-	-	0.1	0.1	0	-	-	-				

Lanes, Volumes, Timings 40: Capitol Blvd & Dennis St

Projected 2040 No Build
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	4	4	4	4	4	4	4	4	4	4	4	4	
Traffic Volume (vph)	225	40	35	40	25	75	20	87.5	40	45	1000	125	
Future Volume (vph)	225	40	35	40	25	75	20	87.5	40	45	1000	125	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	0	125	0	100	175	0	225	0	0	225	0	0	
Storage Lanes	0	1	1	0	1	1	1	1	0	1	1	0	
Taper Length (ft)	25	25	25	25	25	25	25	25	25	25	25	25	
Right Turn on Red	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Link Speed (mph)	30	834	700	15.9	1337	1300	30.4	29.5	0.95	0.95	0.95	0.95	
Travel Time (s)	19.0	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	1%	1%	1%	1%	1%	1%	
Shared Lane Traffic (%)	Perm	NA	Perm	Perm	NA	Perm	pm+pl	NA	pm+pl	NA	NA	NA	
Turn Type	Protected	Phases	4	4	8	8	8	5	2	6	6	6	
Permitted Phases	4	4	4	8	8	8	8	5	2	6	6	6	
Detector Phase	4	4	4	8	8	8	8	5	2	6	6	6	
Switch Phase	7.0	7.0	7.0	7.0	7.0	7.0	5.0	8.0	7.0	8.0	7.0	8.0	
Minimum Initial (s)	33.5	33.5	33.5	33.5	33.5	33.5	9.5	27.5	11.5	27.5	11.5	27.5	
Minimum Spill (s)	34.0	34.0	34.0	34.0	34.0	34.0	9.5	29.4	11.6	29.4	11.6	29.4	
Total Spill (s)	45.3%	45.3%	45.3%	45.3%	45.3%	45.3%	12.7%	39.2%	15.5%	42.0%	15.5%	42.0%	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
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	4.5	
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	
Lead-Lag Optimizer?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	None	None	None	None	None	None	None	None	None	
Intersection Summary	Other												
Area Type:	Other												
Cycle Length: 75													
Actuated Cycle Length: 61.1													
Natural Cycle: 75													
Control Type: Actuated-Uncoordinated													



HCM Signalized Intersection Capacity Analysis 40: Capitol Blvd & Dennis St

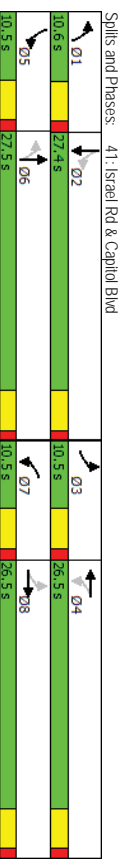
Projected 2040 No Build
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	225	40	35	40	25	75	20	875	40	45	1000	125
Future Volume (vph)	225	40	35	40	25	75	20	875	40	45	1000	125
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	4.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Fit	1.00	0.85	1.00	1.00	0.85	1.00	0.99	1.00	0.98	1.00	0.98	1.00
Fit Protected	0.96	1.00	0.97	1.00	0.97	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Satd. Flow (vpo)	1805	1599	1843	1615	1787	3551	1787	3515	1787	3515	1787	3515
Fit Permitted	0.71	1.00	0.74	1.00	0.74	1.00	0.16	1.00	0.18	1.00	0.18	1.00
Satd. Flow (vpo)	1337	1599	1402	1615	303	3551	348	3515	348	3515	348	3515
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)	227	42	37	42	26	79	21	921	42	47	1053	132
RTOR Reduction (vph)	0	0	27	0	0	57	0	3	0	0	10	0
Lane Group Flow (vph)	0	279	10	0	68	22	21	960	0	47	1175	0
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	4	4	8	8	2	2	6	6	6	6	6	6
Permitted Phases	4	4	8	8	2	2	6	6	6	6	6	6
Actuated Green, G (s)	17.8	17.8	17.8	17.8	30.2	29.4	36.2	32.4	36.2	32.4	36.2	32.4
Effective Green, g (s)	17.8	17.8	17.8	17.8	30.2	29.4	36.2	32.4	36.2	32.4	36.2	32.4
Actuated g/C Ratio	0.28	0.28	0.28	0.28	0.47	0.46	0.56	0.50	0.56	0.50	0.56	0.50
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	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	3.0
Lane Cap Cap (vph)	368	441	368	441	160	1618	280	1735	280	1735	280	1735
W/S Ratio Pct	0.21	0.01	0.05	0.01	0.06	0.08	0.08	0.08	0.08	0.08	0.08	0.08
W/S Ratio Perm	0.76	0.02	0.18	0.05	0.13	0.59	0.17	0.67	0.17	0.67	0.17	0.67
U/T Ratio	21.4	17.0	17.8	17.1	10.0	13.1	7.6	12.0	7.6	12.0	7.6	12.0
Progression Factor	1.00	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	8.7	0.0	0.2	0.0	0.4	1.6	0.3	2.0	0.3	2.0	0.3	2.0
Delay (s)	30.0	17.0	18.0	17.2	10.3	14.7	7.9	14.0	7.9	14.0	7.9	14.0
Level of Service	C	B	B	B	B	B	A	B	A	B	A	B
Approach Delay (s)	28.5											
Approach LOS	C											
Intersection Summary												
HCM 2000 Control Delay	16.0											
HCM 2000 Volume to Capacity ratio	0.70											
Actuated Cycle Length (s)	64.5											
Intersection Capacity Utilization	66.1%											
Analysis Period (min)	15											
C Critical Lane Group												

Lanes, Volumes, Timings 41: Israel Rd & Capitol Blvd

Projected 2040 No Build
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	75	280	215	140	290	205	185	470	40	135	885	100
Future Volume (vph)	75	280	215	140	290	205	185	470	40	135	885	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0	150	0	150	0	150	0	100	0	0
Storage Lanes	1	0	0	1	0	1	0	1	0	1	0	0
Taper Length (ft)	25			25			25			25		
Right Turn on Red												
Link Speed (mph)	30			30			30			30		
Link Distance (ft)	2751			725			934			1337		
Travel Time (s)	62.5			16.5			21.2			30.4		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Turn Type	3	8	7	4	4	1	6	5	2	2	2	2
Protected Phases	3	8	7	4	4	1	6	5	2	2	2	2
Permitted Phases	8	8	4	4	4	6	6	6	6	6	6	6
Detector Phase	3	8	7	4	4	1	6	5	2	2	2	2
Switch Phase												
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Minimum Spill (s)	10.5	26.5	10.5	26.5	10.5	26.5	10.5	26.5	10.5	26.5	10.5	26.5
Total Spill (s)	10.5	26.5	10.5	26.5	10.5	26.5	10.5	26.5	10.5	26.5	10.5	26.5
Total Split (%)	14.0%	35.3%	14.0%	35.3%	14.0%	35.3%	14.0%	35.3%	14.0%	35.3%	14.0%	35.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
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	4.5
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimizer?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	None	None	None	None	None
Intersection Summary												
Area Type: Other												
Cycle Length: 75												
Actuated Cycle Length: 74.7												
Natural Cycle: 90												
Control Type: Actuated-Uncoordinated												



HCM 2010 Signalized Intersection Summary 41: Israel Rd & Capitol Blvd

Projected 2040 No Build
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	1	1	1	1	1	1	1	1	1	1	1	1
Traffic Volume (veh/h)	75	280	215	140	290	205	185	470	40	135	885	100
Future Volume (veh/h)	75	280	215	140	290	205	185	470	40	135	885	100
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped Bike Adj(A, pb7)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/hln	1900	1900	1900	1863	1900	1881	1881	1900	1881	1881	1900	1900
Adj Flow Rate, veh/h	79	295	163	147	305	216	195	495	42	932	105	0
Adj No of Lanes	1	1	0	1	1	0	1	2	0	1	2	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh. %	0	0	0	2	2	2	1	1	1	1	1	1
Cap. veh/h	215	328	181	276	305	216	261	1051	89	405	1001	113
Arrive On Green	0.07	0.29	0.29	0.08	0.30	0.30	0.08	0.31	0.31	0.08	0.31	0.31
Sat Flow, veh/h	1810	1151	636	1774	1016	720	1792	3336	282	1792	3239	365
Grip Volume(V), veh/h	79	0	458	147	0	521	195	265	272	142	514	523
Grip Sat Flow(s), veh/hln	1810	0	1788	1774	0	1736	1792	1787	1831	1792	1787	1817
Q Serve(s), s	2.2	0.0	18.2	4.2	0.0	22.2	5.5	8.8	8.9	3.9	20.7	20.7
Cycle Q Clear(g, c), s	2.2	0.0	18.2	4.2	0.0	22.2	5.5	8.8	8.9	3.9	20.7	20.7
Prop In Lane	1.00	0.36	1.00	0.36	1.00	0.41	1.00	0.15	1.00	0.20	1.00	0.20
Lane Cap Cap(c), veh/h	215	0	510	276	0	521	261	563	577	405	553	562
V/C Ratio(X)	0.37	0.00	0.90	0.53	0.00	1.00	0.75	0.47	0.47	0.35	0.93	0.93
Avail Cap(c, a), veh/h	244	0	531	277	0	521	261	563	577	413	553	562
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(f)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.4	0.0	25.4	18.9	0.0	25.9	18.8	20.4	20.4	15.7	24.8	24.8
Incr Delay (d2), s/veh	1.3	0.0	17.9	2.3	0.0	39.2	11.5	2.8	2.8	0.6	24.5	24.2
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackQ(50%), veh/h	1.2	0.0	11.4	2.2	0.0	16.2	3.5	4.8	4.9	2.0	13.9	14.1
LnGrp Delay(d), s/veh	20.6	0.0	43.3	21.2	0.0	65.1	30.4	23.2	23.2	16.4	49.3	49.0
LnGrp LOS	C		D	C		E	C	C	C	B	D	D
Approach Vol, veh/h	537			668			732			1179		
Approach Delay, s/veh	40.0			55.5			25.1			45.2		
Approach LOS	D			E			C			D		
Timer	1	2	3	4	5	6	7	8				
Assigned PIs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+R), s	106	27.4	9.3	26.7	102	27.8	10.4	25.6				
Change Period (Y+R), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	6.1	22.9	6.0	22.0	6.0	23.0	6.0	22.0				
Max Q Clear Time (Q, c+1), s	7.5	22.7	4.2	24.2	5.9	10.9	6.2	20.2				
Green Ext Time (p, c), s	0.0	0.2	0.0	0.0	0.0	8.4	0.0	0.9				
Intersection Summary												
HCM 2010 Ctrl Delay	418											
HCM 2010 LOS	D											

HCM 2010 TWSC 42: 66th Ave & Black Lake Belmore Rd

Projected 2040 No Build
PM Peak Hour

Intersection	6.1											
Int Delay, s/veh	6.1											
Movement	EBL	EBT	WBT	WBR	SBL	SBR						
Traffic Vol, veh/h	75	105	135	210	125	140						
Future Vol, veh/h	75	105	135	210	125	140						
Conflicting Peds, #/hr	0	0	0	0	0	0						
Sign Control	Free	Free	Free	Free	Stop	Stop						
RT Channelized	-	None	-	None	-	None						
Storage Length	-	-	-	-	0	-						
Veh in Median Storage, #	-	0	0	0	0	-						
Grade, %	-	-	-	-	-	-						
Peak Hour Factor	95	95	95	95	95	95						
Heavy Vehicles, %	1	1	1	1	0	0						
Mvmt Flow	79	111	142	221	132	147						

Major/Minor	Major1	Major2	Minor2	
Conflicting Flow All	363	0	521	253
Stage 1	-	-	253	-
Stage 2	-	-	268	-
Critical Hdwy	4.11	-	6.4	6.2
Critical Hdwy Sig 1	-	-	5.4	-
Critical Hdwy Sig 2	-	-	5.4	-
Follow-up Hdwy	2.209	-	3.5	3.3
Pot Cap-1 Maneuver	1201	-	519	791
Stage 1	-	-	794	-
Stage 2	-	-	782	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	1201	-	483	791
Mov Cap-2 Maneuver	-	-	483	-
Stage 1	-	-	794	-
Stage 2	-	-	727	-
Approach	EB	WB	SB	
HCM Control Delay, s	3.4	0	15.8	
HCM LOS			C	
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR/SBL
Capacity (veh/h)	1201	-	-	608
HCM Lane V/C Ratio	0.066	-	-	0.459
HCM Control Delay (s)	8.2	0	-	15.8
HCM Lane LOS	A	A	-	C
HCM 95th %ile Q(veh)	0.2	-	-	2.4

HCM 2010 TWSC
43: Kirsop Rd & 66th Ave

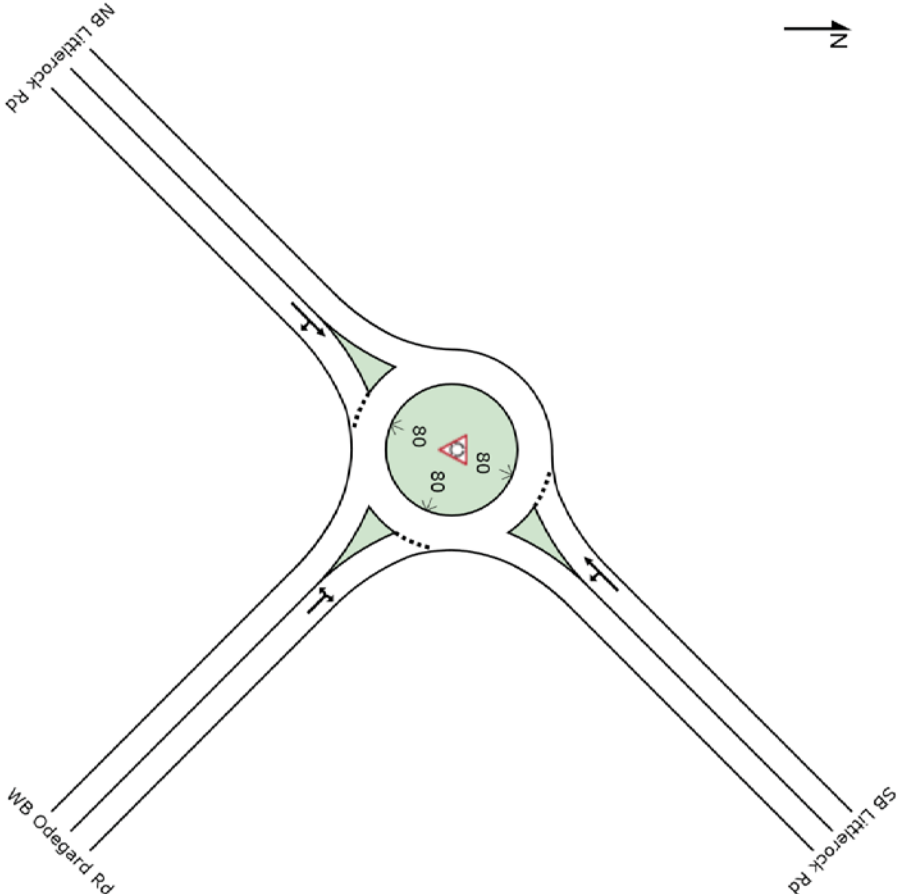
Projected 2040 No Build
PM Peak Hour

Intersection																		
Int Delay, s/veh		9.2																
Movement																		
Traffic Vol, veh/h	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR						
Future Vol, veh/h	40	5	205	5	2	5	340	15	5	5	15	85						
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	95	95	95	95	95	95	95	95	95	95	95	95						
Heavy Vehicles, %	1	1	1	0	0	0	1	1	1	0	0	0						
Wmtl Flow	42	5	216	5	2	5	358	16	5	5	16	89						
Major/Minor																		
Conflicting Flow All	Minor2		808	61	Minor1		916	850	18	Major1		105	0	0	Major2			
Stage 1	71	71	-	734	734	-	734	734	-	-	-	-	-	-	21	0	0	0
Stage 2	738	737	-	182	116	-	182	116	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	7.11	6.51	6.21	7.11	6.5	6.2	7.1	6.5	6.2	4.11	-	-	-	-	4.1	-	-	-
Critical Hdwy Sig 1	6.11	5.51	-	6.11	5.5	-	6.1	5.5	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Sig 2	6.11	5.51	-	6.11	5.51	-	6.1	5.5	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	4.009	3.309	3.5	4	3.3	3.5	4	3.3	2.209	-	-	-	-	2.2	-	-	-
Poi Cap-1 Maneuver	300	316	1007	255	300	1066	255	300	1066	1493	-	-	-	-	1608	-	-	-
Stage 1	941	838	-	415	429	-	415	429	-	-	-	-	-	-	-	-	-	-
Stage 2	411	426	-	824	803	-	824	803	-	-	-	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Moar Cap-1 Maneuver	240	238	1007	160	226	1066	160	226	1066	1493	-	-	-	-	1608	-	-	-
Moar Cap-2 Maneuver	240	238	-	160	226	-	160	226	-	-	-	-	-	-	-	-	-	-
Stage 1	712	835	-	314	325	-	314	325	-	-	-	-	-	-	-	-	-	-
Stage 2	308	322	-	641	801	-	641	801	-	-	-	-	-	-	-	-	-	-
Approach																		
HCM Control Delay, s	EB		14.5	WB		19.1	NB		7.7	SB			0.3					
HCM LOS	B		-	C		-	-			-	-							
Minor Lane/Major Wmtl																		
Capacity (veh/h)	NBL	NBT	NBR	EBL	NBL	NBT	NBR	SBL	SBT	SBR	-							
HCM Lane V/C Ratio	0.24	-	-	0.412	0.047	0.003	-	-	-	-	-							
HCM Control Delay (s)	8.2	0	-	14.5	19.1	7.2	0	-	-	-	-							
HCM Lane LOS	A	A	-	B	C	A	A	A	A	-	-							
HCM 95th %ile Q(veh)	0.9	-	-	2	0.1	0	-	-	-	-	-							

SITE LAYOUT

Site: 44) Litterrock Rd at Odegard Rd

Projected 2040 Baseline
PM Peak Hour
Roundabout



MOVEMENT SUMMARY

Site: 44) Litterock Rd at Oddegard Rd

Projected 2040 Baseline
PM Peak Hour
Roundabout

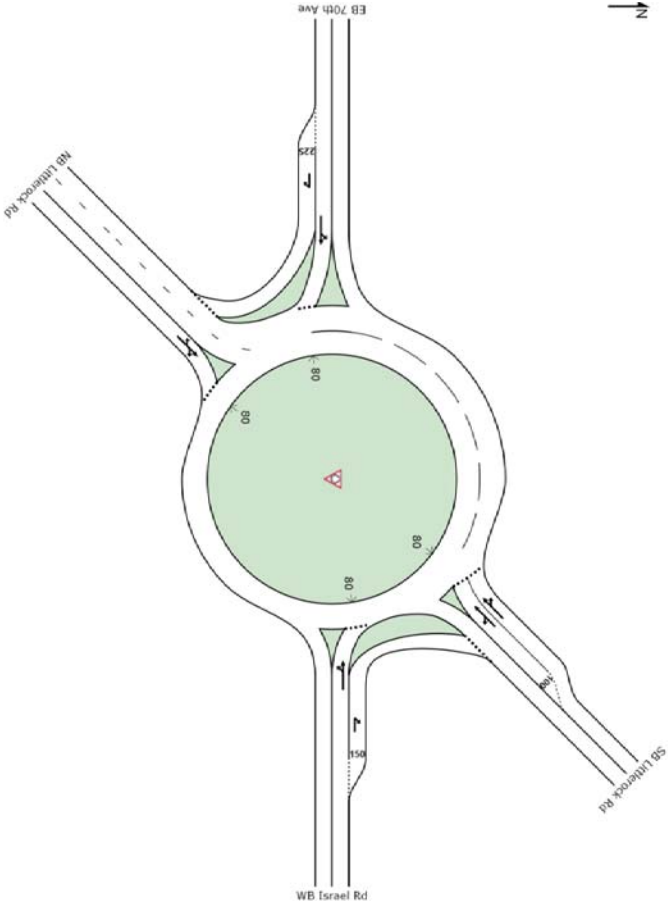
Movement Performance - Vehicles										
Mov ID	OD Mov	Demand Flows		Deg Satn	Average Delay	Level of Service	95% Back of Queue	Prop. Queued	Effective Stop Rate	Average Speed
		Total veh/h	HV %	V/C	sec		Vehicles/veh	Distance ft	per veh	mph
Southeast: WB Oddegard Rd										
3x	L2	26	0.0	0.082	18.7	LOS B	0.5	12.5	0.85	31.0
18x	R2	11	0.0	0.082	13.4	LOS B	0.5	12.5	0.85	30.3
Approach		37	0.0	0.082	17.2	LOS B	0.5	12.5	0.85	30.8
Northeast: SB Litterock Rd										
1x	L2	11	1.0	0.829	10.2	LOS B	19.5	491.0	0.57	35.5
6x	T1	996	1.0	0.829	4.9	LOS A	19.5	491.0	0.57	35.6
Approach		1005	1.0	0.829	4.9	LOS A	19.5	491.0	0.57	35.6
Southwest: NB Litterock Rd										
2x	T1	1026	1.0	0.832	4.5	LOS A	20.5	517.5	0.35	36.3
12x	R2	5	1.0	0.832	4.4	LOS A	20.5	517.5	0.35	35.4
Approach		1032	1.0	0.832	4.5	LOS A	20.5	517.5	0.35	36.3
All Vehicles		2074	1.0	0.832	4.9	LOS A	20.5	517.5	0.47	35.9

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik MSD).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 45) Litterock Rd at Israel Rd

Projected 2040 Baseline
PM Peak Hour
Roundabout



MOVEMENT SUMMARY

Site: 45) Litterrock Rd at Israel Rd

Projected 2040 Baseline
PM Peak Hour
Roundabout

Movement Performance - Vehicles										
Mov	OD	Demand Flows	Deg	Average	Level of	95% Back of Queue	Pop.	Effective	Average	
ID	Mov	Total	HV %	Delay	Service	Vehicles	Distance	Stop Rate	Speed	
		veh/h	%	sec		veh	ft	per veh	per veh	mph
East WB Israel Rd										
1a	L1	116	1.0	0.581	17.9	LOS B	5.9	148.5	1.00	1.06
6	T1	247	1.0	0.581	13.7	LOS B	5.9	148.5	1.00	1.06
16b	R3	447	1.0	0.504	8.3	LOS A	4.3	108.2	0.83	0.84
Approach		811	1.0	0.581	11.3	LOS B	5.9	148.5	0.91	0.94
NorthEast SB Litterrock Rd										
1bx	L3	232	1.0	0.684	21.0	LOS C	7.7	193.8	0.95	1.10
6x	T1	647	1.0	0.684	13.9	LOS B	8.2	205.5	0.96	1.08
16ax	R1	179	1.0	0.684	12.8	LOS B	8.2	205.5	0.96	1.06
Approach		1058	1.0	0.684	15.2	LOS B	8.2	205.5	0.96	1.08
West EB 70th Ave										
5a	L1	132	1.0	0.415	12.4	LOS B	2.4	59.3	0.79	0.89
2	T1	132	1.0	0.415	8.4	LOS A	2.4	59.3	0.79	0.89
12b	R3	121	1.0	0.159	6.3	LOS A	0.7	18.2	0.62	0.78
Approach		384	1.0	0.415	9.1	LOS A	2.4	59.3	0.73	0.86
SouthWest NB Litterrock Rd										
5bx	L3	289	1.0	1.055	63.4	LOS F	39.7	1001.2	1.00	2.01
2x	T1	426	1.0	1.055	57.0	LOS F	39.7	1001.2	1.00	2.01
12ax	R1	100	1.0	1.055	56.7	LOS F	39.7	1001.2	1.00	2.01
Approach		816	1.0	1.055	59.2	LOS E	39.7	1001.2	1.00	2.01
All Vehicles		3068	1.0	1.055	25.1	LOS C	39.7	1001.2	0.93	1.26

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik MSD).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

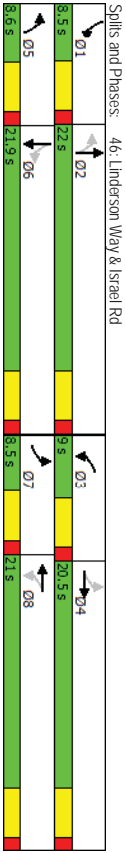
SIDRA INTERSECTION 6.1 | Copyright © 2000-2015 Akcelik and Associates Pty Ltd | sidrasolutions.com
Organisation: SCJ ALLIANCE | Processed: Wednesday, February 17, 2016 2:17:41 PM
Project: N:\Projects\0625_City of Tumwater\0625.17 Tumwater Transportation Master Plan\Traffic\Operations\sidra 2040 Baseline\Projected 2040 Baseline PM.sp6

Lanes, Volumes, Timings
46: Lindereson Way & Israel Rd

Projected 2040 No Build
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	→	↱	↰	→	↱	↰	→	↱	↰	→	↱
Traffic Volume (vph)	70	400	125	135	465	25	200	260	90	40	140	140
Future Volume (vph)	70	400	125	135	465	25	200	260	90	40	140	140
Ideal Flow (vph/p)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200	0	200	0	200	0	150	0	100	0	0	0
Storage Lanes	1	0	1	0	1	0	1	0	1	0	0	0
Taper Length (ft)	25	0	25	0	25	0	25	0	25	0	0	0
Right Turn on Red		Yes			Yes			Yes			Yes	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		3505			2751			2073			847	
Travel Time (s)		79.7			62.5			47.1			19.3	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	pm+pl	NA	pm+pl	NA	pm+pl	NA	pm+pl	NA	pm+pl	NA	pm+pl	NA
Protected Phases	7	4	3	8	5	2	1	6				
Permitted Phases	4	4	8	3	8	2	6					
Detector Phase	7	4	3	8	5	2	1	6				
Switch Phase												
Minimum Initial (s)	4.0	5.0	4.0	5.0	4.0	6.0	4.0	6.0				
Minimum Spill (s)	8.5	20.5	8.5	20.5	8.5	21.5	8.5	21.5				
Total Spill (s)	8.5	20.5	9.0	21.0	8.6	22.0	8.5	21.9				
Total Split (%)	14.2%	34.2%	15.0%	35.0%	14.3%	36.7%	14.2%	36.5%				
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5				
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0				
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimizer?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	None	None	None	None				













Intersection Summary		Other
Area Type:		
Cycle Length: 60		
Actuated Cycle Length: 58.3		
Natural Cycle: 70		
Control Type: Actuated-Uncoordinated		



HCM 2010 Signalized Intersection Summary

46: Linderson Way & Israel Rd

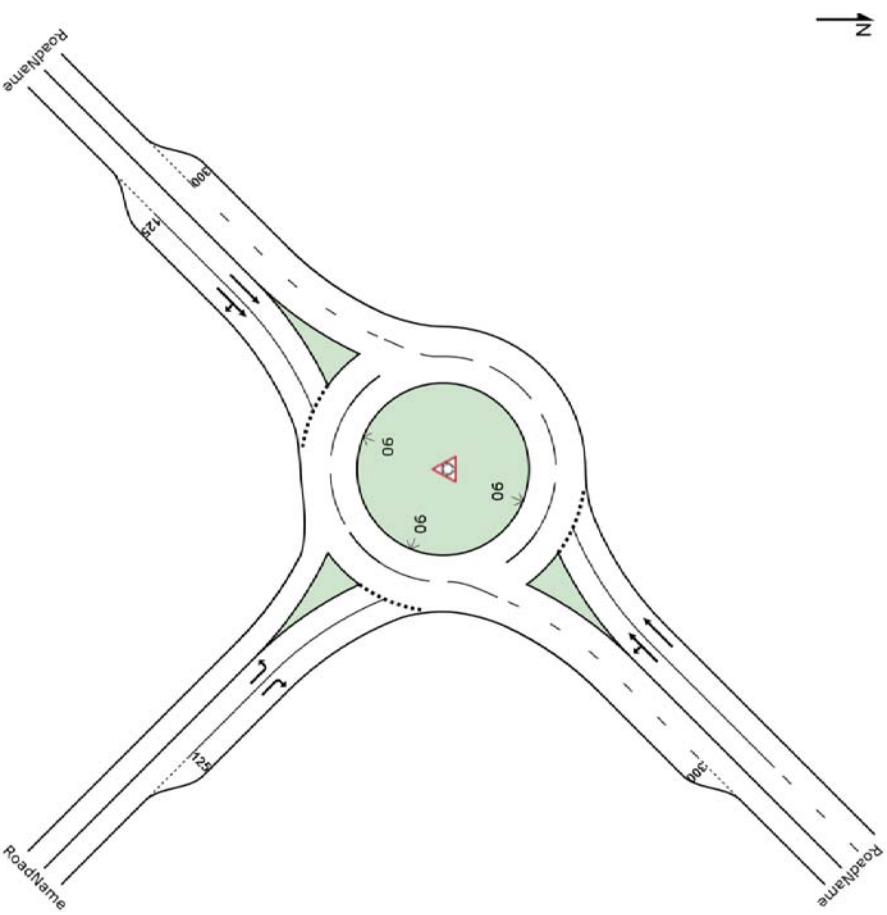
Projected 2040 No Build
PM Peak Hour

Movement												
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (veh/h)	70	400	125	135	465	25	200	260	90	40	140	140
Future Volume (veh/h)	70	400	125	135	465	25	200	260	90	40	140	140
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped/Bike Adj(A_pb7)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/hln	1881	1881	1900	1881	1881	1900	1881	1881	1900	1881	1881	1900
Adj Flow Rate, veh/h	74	421	132	142	489	26	211	274	21	42	147	147
Adj No of Lanes	1	1	1	0	1	1	1	1	0	1	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh. %	1	1	1	1	1	1	1	1	1	1	1	1
Cap. veh/h	227	366	115	254	521	28	400	560	43	395	251	251
Arrive On Green	0.05	0.27	0.27	0.08	0.29	0.29	0.07	0.32	0.32	0.03	0.29	0.29
Sat Flow, veh/h	1792	1374	431	1792	1770	94	1792	1726	132	1792	864	864
Grip Volume(V), veh/h	74	0	553	142	0	515	211	0	295	42	0	294
Grip Sat Flow(s), veh/hln	1792	0	1805	1792	0	1865	1792	0	1858	1792	0	1729
Q Serve(g.s), s	1.8	0.0	16.0	3.4	0.0	16.2	4.1	0.0	7.6	1.0	0.0	8.7
Cycle Q Clear(g.c), s	1.8	0.0	16.0	3.4	0.0	16.2	4.1	0.0	7.6	1.0	0.0	8.7
Prop In Lane	1.00	0.24	1.00	0.05	1.00	0.05	1.00	0.07	1.00	0.07	1.00	0.50
Lane Grp Cap(c), veh/h	227	0	481	254	0	549	400	0	603	395	0	501
W/C Ratio(X)	0.33	0.00	1.15	0.56	0.00	0.94	0.53	0.00	0.49	0.11	0.00	0.59
Avail Cap(c), veh/h	262	0	481	254	0	549	400	0	603	395	0	501
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(f)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	16.6	0.0	22.0	16.3	0.0	20.6	16.2	0.0	16.3	14.3	0.0	18.2
Incr Delay (d2), s/veh	0.3	0.0	88.7	1.7	0.0	24.1	0.7	0.0	2.8	0.0	0.0	5.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOf(50%), veh/h	0.9	0.0	19.8	1.7	0.0	12.0	1.2	0.0	4.4	0.5	0.0	4.9
LnGrp Delay(d), s/veh	16.9	0.0	110.7	17.9	0.0	44.7	16.9	0.0	19.1	14.4	0.0	23.2
LnGrp LOS	B		F	B		D	B		B	B		C
Approach Vol, veh/h	627			657			506			336		
Approach Delay, s/veh	99.7			38.9			18.2			22.1		
Approach LOS	F			D			B			C		
Timer	1	2	3	4	5	6	7	8				
Assigned PIs	1	2	3	4	5	6	7	8				
Pls Duration (G+Y+Rd), s	6.5	24.0	9.0	20.5	8.6	21.9	7.3	22.2				
Change Period (Y+Rd), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	4.0	17.5	4.5	16.0	4.1	17.4	4.0	16.5				
Max Q Clear Time (Q_c+1), s	3.0	9.6	5.4	18.0	6.1	10.7	3.8	18.2				
Green Ext Time (Q_c), s	0.0	2.3	0.0	0.0	0.0	2.0	0.0	0.0				
Intersection Summary												
HCM 2010 Crt Delay	49.2											
HCM 2010 LOS	D											

SITE LAYOUT

Site: 47) Litterrock Rd at Tumwater Blvd

Projected 2040 Baseline
PM Peak Hour
Roundabout



MOVEMENT SUMMARY

Site: 47) Litterock Rd at Tumwater Blvd

Projected 2040 Baseline
PM Peak Hour
Roundabout

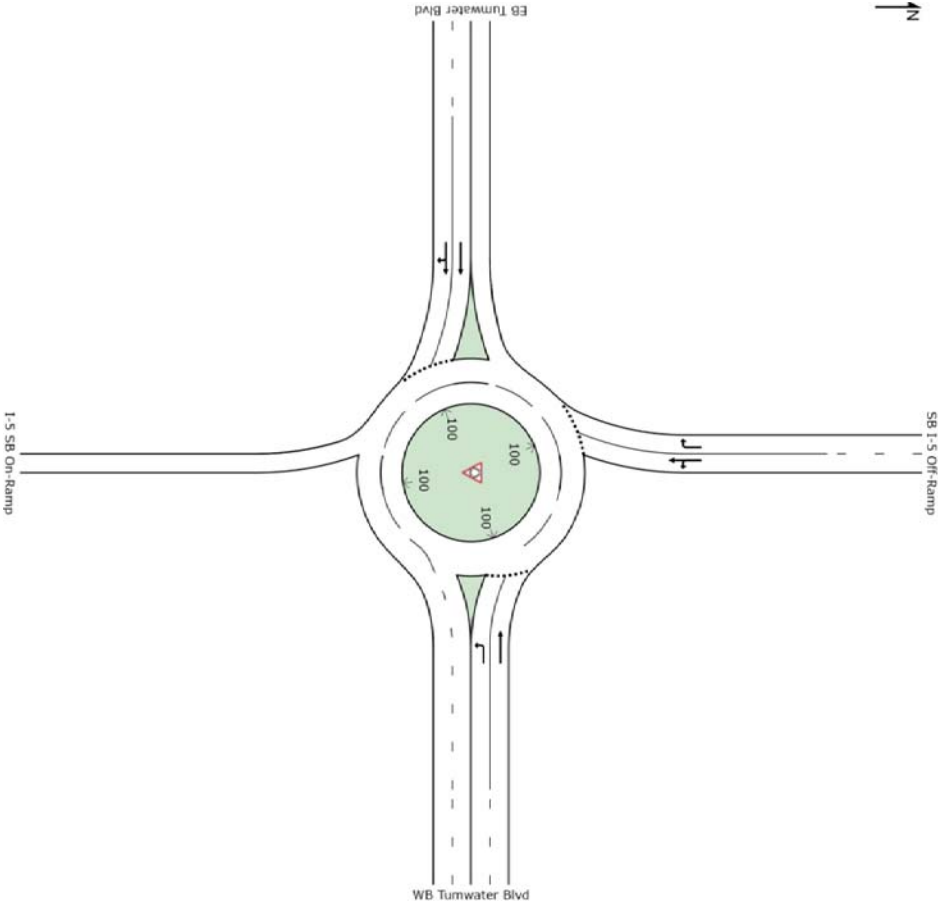
Movement Performance - Vehicles									
Mov	OD	Demand Flows	Deg. Satn	Average Delay	Level of Service	95% Back of Queue	Pop. Queued	Effective Stop Rate	Average Speed
ID	Mov	Total veh/s	HV %	sec		Vehicles	Distance ft	per veh	mph
SouthEast: RoadName									
3x	L2	416	1.0	0.396	LOS B	2.5	62.2	0.54	0.72
18x	R2	400	1.0	0.390	LOS A	2.4	60.5	0.54	0.63
Approach									
		816	1.0	0.396	LOS A	2.5	62.2	0.54	0.68
NorthEast: RoadName									
1x	L2	426	1.0	0.640	LOS B	6.0	150.6	0.77	0.87
6x	T1	511	1.0	0.640	LOS A	6.0	150.6	0.69	0.76
Approach									
		937	1.0	0.640	LOS B	6.0	150.6	0.73	0.80
SouthWest: RoadName									
2x	T1	295	0.0	0.314	LOS A	1.9	47.9	0.62	0.59
12x	R2	232	0.0	0.288	LOS A	1.5	38.5	0.60	0.69
Approach									
		526	0.0	0.314	LOS A	1.9	47.9	0.61	0.64
All Vehicles									
		2279	0.8	0.640	LOS A	6.0	150.6	0.63	0.72
34.5									

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik MSD).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 48) Tumwater Blvd at I-5 SB Ramps

Projected 2040 Baseline
Roundabout



MOVEMENT SUMMARY

Site: (48) Tumwater Blvd at I-5 SB Ramps

Projected 2040 Baseline
Roundabout

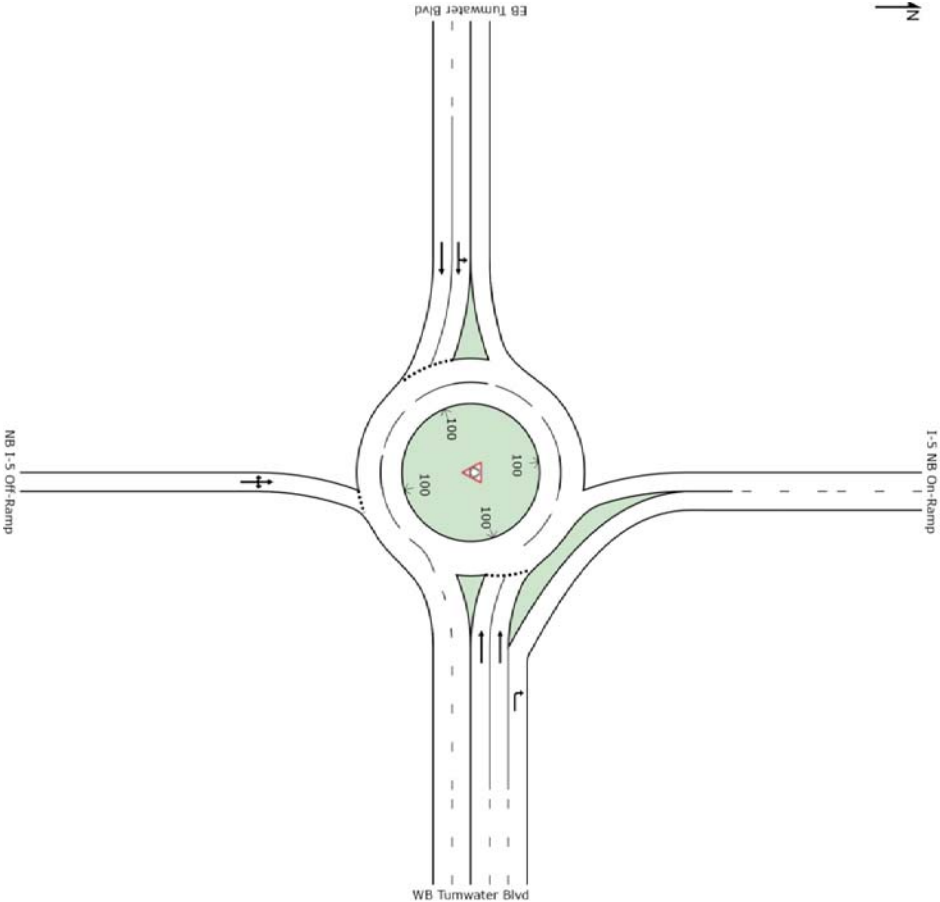
Movement Performance - Vehicles										
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Pop. Queued	Effective Stop Rate per veh
East WB Tumwater Blvd										
1	L2	363	2.0	0.243	4.4	LOS A	0.0	0.0	0.00	0.00
6	T1	563	2.0	0.315	4.5	LOS A	0.0	0.0	0.00	0.00
Approach										
		926	2.0	0.315	4.5	LOS A	0.0	0.0	0.00	0.00
North: SB I-5 Off-Ramp										
7	L2	405	2.0	0.588	13.5	LOS B	3.4	87.4	0.71	0.80
4	T1	32	2.0	0.588	13.5	LOS B	3.4	87.4	0.71	0.80
14	R2	542	2.0	0.600	12.8	LOS B	4.0	101.0	0.72	0.81
Approach		979	2.0	0.600	13.1	LOS B	4.0	101.0	0.71	0.81
West: EB Tumwater Blvd										
2	T1	753	2.0	0.988	37.4	LOS D	26.8	681.7	0.96	1.64
12	R2	363	2.0	0.988	54.4	LOS D	26.8	681.7	1.00	2.17
Approach		1116	2.0	0.988	42.9	LOS D	26.8	681.7	0.98	1.81
All Vehicles		3021	2.0	0.988	21.5	LOS C	26.8	681.7	0.59	0.93
										22.1

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik MSD).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: (49) Tumwater Blvd at I-5 NB Ramps

Projected 2040 Baseline
Roundabout



MOVEMENT SUMMARY

Site: 49) Turnwater Blvd at I-5 NB Ramps

Projected 2040 Baseline
Roundabout

Movement Performance - Vehicles												
Mov	OD	Demand Flows	HV	Deg	Average	Level of	95% Back of Queue	Pro.	Effective	Average		
ID	Mov	Total	%	Satn	Delay	Service	Vehicles Distance	Queued	Stop Rate	Speed		
South: NB I-5 Off-Ramp												
3	L2	182	2.0	0.571	15.6	LOS B	3.4	86.8	0.75	0.86	24.5	
8	T1	5	2.0	0.571	15.6	LOS B	3.4	86.8	0.75	0.86	27.0	
18	R2	182	2.0	0.571	15.6	LOS B	3.4	86.8	0.75	0.86	23.4	
Approach		369	2.0	0.571	15.6	LOS B	3.4	86.8	0.75	0.86	24.0	
East: WB Turnwater Blvd												
6	T1	737	2.0	0.654	12.8	LOS B	7.3	185.2	0.85	0.90	22.7	
16	R2	1101	2.0	0.671	0.2	LOS A	0.0	0.0	0.00	0.00	25.0	
Approach		1838	2.0	0.671	5.3	LOS A	7.3	185.2	0.34	0.36	24.0	
West: EB Turnwater Blvd												
5	L2	394	2.0	0.294	5.0	LOS A	0.0	0.0	0.00	0.00	28.1	
2	T1	747	2.0	0.420	5.7	LOS A	0.0	0.0	0.00	0.00	26.1	
Approach		1141	2.0	0.420	5.5	LOS A	0.0	0.0	0.00	0.00	26.7	
All Vehicles		3348	2.0	0.671	6.5	LOS A	7.3	185.2	0.27	0.29	24.9	

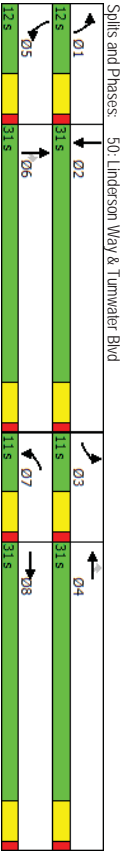
Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik MCD).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Lanes, Volumes, Timings
50: Linderson Way & Turnwater Blvd

Projected 2040 No Build
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔↔	↔↔↔	↔↔↔	↔↔↔	↔↔↔	↔↔↔	↔↔↔	↔↔↔	↔↔↔	↔↔↔	↔↔↔	↔↔↔
Traffic Volume (vph)	90	655	245	130	805	30	175	135	75	210	235	790
Future Volume (vph)	90	655	245	130	805	30	175	135	75	210	235	790
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300	0	350	250	250	150	300	700				
Storage Lanes	2	0	1	1	1	1	1	1				
Taper Length (ft)	25	0	25	25	25	25	25	25				
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		895			1275			1018			2073	
Travel Time (s)		20.3			29.0			23.1			47.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Free
Protected Phases	3	8		7	4	4	1	6		5	2	
Permitted Phases												
Detector Phase	3	8		7	4	4	1	6		5	2	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Minimum Split (s)	11.0	31.0		11.0	31.0	31.0	11.0	31.0		11.0	31.0	
Total Split (s)	11.0	31.0		11.0	31.0	31.0	12.0	31.0		31.0	12.0	
Total Split (%)	12.9%	36.5%		12.9%	36.5%	14.1%	36.5%	36.5%		14.1%	36.5%	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lag	Lag		Lead	Lag	
Lead-Lag Optimizer?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Recall Mode	None	Max		None	Max	Max	None	None		None	None	













Intersection Summary		Other										
Area Type:												
Cycle Length: 85												
Actuated Cycle Length: 74												
Natural Cycle: 85												
Control Type: Actuated-Uncoordinated												



HCM 2010 Signalized Intersection Summary

Projected 2040 No Build
PM Peak Hour

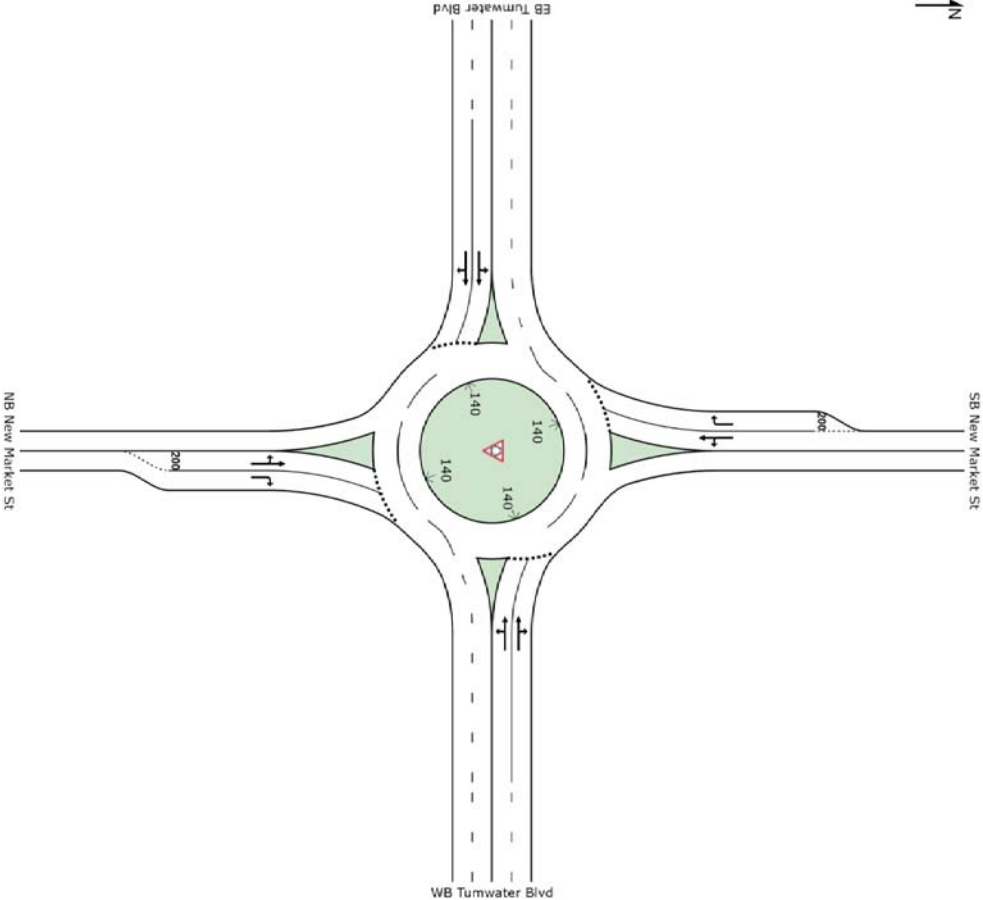
50: Linderson Way & Turnwater Blvd

Movement												
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (veh/h)	90	655	245	130	805	30	175	135	75	210	235	790
Future Volume (veh/h)	90	655	245	130	805	30	175	135	75	210	235	790
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pb7)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/hln	1863	1863	1900	1881	1881	1881	1881	1881	1881	1881	1881	1881
Adj Flow Rate, veh/h	95	689	258	137	847	32	184	142	79	221	247	0
Adj No. of Lanes	2	2	2	1	2	1	1	1	1	1	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh. %	2	2	2	1	1	1	1	1	1	1	1	1
Cap. veh/h	244	909	340	149	1333	596	174	342	291	174	342	291
Arrive On Green	0.07	0.36	0.36	0.08	0.37	0.37	0.10	0.18	0.18	0.10	0.18	0.00
Sat Flow, veh/h	3442	2522	944	1792	3514	1599	1792	1881	1599	1792	1881	1599
Grip Volume(V), veh/h	95	484	463	137	847	32	184	142	79	221	247	0
Grip Sat Flow(s), veh/hln	1721	1770	1696	1792	1787	1599	1792	1881	1599	1792	1881	1599
Q Serve(g), s	1.9	17.3	17.3	5.5	14.0	0.9	7.0	4.8	3.1	7.0	8.9	0.0
Cycle Q Clear(g), s	1.9	17.3	17.3	5.5	14.0	0.9	7.0	4.8	3.1	7.0	8.9	0.0
Prop In Lane	1.00	0.56	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Grp Cap(c), veh/h	244	638	611	149	1333	596	174	342	291	174	342	291
W/C Ratio(X)	0.39	0.76	0.76	0.92	0.64	0.05	1.06	0.41	0.27	1.27	0.72	0.00
Avail Cap(c), veh/h	286	638	611	149	1333	596	174	678	576	174	678	576
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(f)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	32.0	20.3	20.3	32.8	18.6	14.5	32.6	26.1	25.4	32.6	27.8	0.0
Incr Delay (d2), s/veh	1.0	8.2	8.6	50.3	2.3	0.2	84.5	0.8	0.5	159.2	2.9	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOf(50%), veh/h	0.9	9.9	9.6	4.8	7.4	0.4	7.5	2.6	1.4	11.1	4.9	0.0
LnGrp Delay(d), s/veh	33.0	28.5	28.9	83.2	20.9	14.6	117.1	26.9	25.9	191.7	30.7	0.0
LnGrp LOS	C	C	C	F	C	B	F	C	C	F	C	C
Approach Vol, veh/h	1042			1016			405			468		
Approach Delay, s/veh	29.1			29.1			67.7			106.7		
Approach LOS	C			C			E			F		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rd), s	120	18.1	10.1	31.9	12.0	18.1	11.0	31.0				
Change Period (Y+Rd), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0				
Max Green Setting (Gmax), s	7.0	26.0	6.0	26.0	7.0	26.0	6.0	26.0				
Max Q Clear Time (Q_c+1), s	9.0	10.9	3.9	16.0	9.0	6.8	7.5	19.3				
Green Ext Time (p_c), s	0.0	2.2	0.0	7.4	0.0	2.4	0.0	5.3				
Intersection Summary												
HCM 2010 Ctrl Delay	468											
HCM 2010 LOS	D											

SITE LAYOUT

Site: 51) New Market Rd at Turnwater Blvd

Projected 2040 Baseline
PM Peak Hour
Roundabout



MOVEMENT SUMMARY

Site: 51) New Market Rd at Turnwater Blvd

Projected 2040 Baseline
PM Peak Hour
Roundabout

Movement Performance - Vehicles										
Mov	OD	Demand Flows	Deg. Satn	Average Delay	Level of Service	95% Back of Queue	Pop. Queued	Effective Stop Rate	Average Speed	
ID	Mov	Total veh/h	HV %	sec		Vehicles Distance		per veh	mph	
Scout: NB New Market St										
3	L2	26	0.0	0.055	LOS B	0.2	5.4	0.65	0.82	34.5
8	T1	5	0.0	0.055	LOS A	0.2	5.4	0.65	0.82	34.1
18	R2	68	0.0	0.085	LOS A	0.4	9.4	0.65	0.72	35.7
Approach										
		100	0.0	0.085	LOS A	0.4	9.4	0.65	0.75	35.3
East WB Turnwater Blvd										
1	L2	68	2.0	0.335	LOS B	2.3	57.4	0.38	0.44	37.7
6	T1	784	2.0	0.335	LOS A	2.3	58.6	0.37	0.41	37.6
16	R2	63	2.0	0.335	LOS A	2.3	58.6	0.36	0.38	36.3
Approach										
		916	2.0	0.335	LOS A	2.3	58.6	0.37	0.41	37.5
North: SB New Market St										
7	L2	126	4.0	0.215	LOS B	0.9	22.7	0.61	0.84	34.6
4	T1	26	4.0	0.215	LOS A	0.9	22.7	0.61	0.84	34.3
14	R2	232	4.0	0.282	LOS A	1.1	29.7	0.61	0.71	35.7
Approach										
		384	4.0	0.282	LOS A	1.1	29.7	0.61	0.76	35.2
West: EB Turnwater Blvd										
5	L2	95	4.0	0.420	LOS B	3.0	77.5	0.54	0.52	36.9
2	T1	911	4.0	0.420	LOS A	3.1	80.0	0.52	0.47	36.9
12	R2	32	4.0	0.420	LOS A	3.1	80.0	0.51	0.44	35.7
Approach										
		1037	4.0	0.420	LOS A	3.1	80.0	0.53	0.48	36.9
All Vehicles										
		2437	3.1	0.420	LOS A	3.1	80.0	0.48	0.51	36.8

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akceik MSD).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

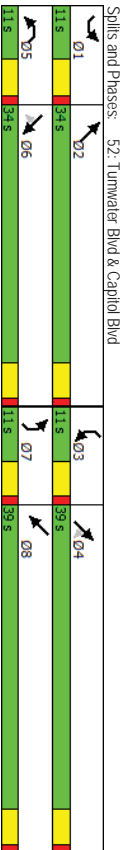
SIDRA INTERSECTION 6.1 | Copyright © 2000-2015 Akceik and Associates Pty Ltd | sidrasolutions.com
Organisation: SCJ ALLIANCE | Processed: Wednesday, February 17, 2016 2:48:46 PM
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Lanes, Volumes, Timings
52: Turnwater Blvd & Capitol Blvd

Projected 2040 No Build
PM Peak Hour












Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	150	980	195	225	515	20	175	350	300	110	345	20
Future Volume (vph)	150	980	195	225	515	20	175	350	300	110	345	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250	0	200	0	275	0	200	0	200	0	200	0
Storage Lanes	1	1	2	1	2	0	1	1	1	1	1	0
Taper Length (ft)	25		Yes	25		Yes	25		Yes	25		Yes
Right Turn on Red												
Link Speed (mph)		50			50		30			30		30
Link Distance (ft)		934			3620		2404			1729		1729
Travel Time (s)		12.7			49.4		54.6			39.3		39.3
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	3%	3%	3%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Perm	Prot	NA	Perm	NA
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases												
Detector Phase	1	6	6	5	2		7	4	4	3	8	
Switch Phase												
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Minimum Split (s)	11.0	34.0	34.0	11.0	34.0		11.0	39.0	39.0	11.0	39.0	
Total Split (s)	11.0	34.0	34.0	11.0	34.0		11.0	39.0	39.0	11.0	39.0	
Total Split (%)	11.6%	35.8%	35.8%	11.6%	35.8%		11.6%	41.1%	41.1%	11.6%	41.1%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimizer?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	Max	Max	None	Max		None	None	None	None	None	

Intersection Summary		Other	
Area Type:			
Cycle Length: 95			
Actuated Cycle Length: 84.3			
Natural Cycle: 95			
Control Type: Actuated-Uncoordinated			



HCM 2010 Signalized Intersection Summary 52: Turnwater Blvd & Capitol Blvd

Projected 2040 No Build
PM Peak Hour

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	150	980	195	225	515	20	175	350	300	110	345	20
Future Volume (veh/h)	150	980	195	225	515	20	175	350	300	110	345	20
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Q ₀), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A _{pb})	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/hln	1845	1845	1845	1881	1881	1900	1881	1881	1881	1881	1900	1900
Adj Flow Rate, veh/h	158	1032	131	237	542	21	184	368	90	116	363	21
Adj No. of Lanes	1	2	2	2	2	0	1	1	1	1	2	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh. %	3	3	3	3	1	1	1	1	1	1	1	1
Cap. veh/h	128	1233	552	253	1234	48	130	489	416	130	893	51
Arrive On Green	0.07	0.35	0.35	0.07	0.35	0.35	0.07	0.26	0.07	0.26	0.26	0.26
Sat Flow, veh/h	1757	3505	1568	3476	3509	136	1792	1881	1599	1792	3435	1986
Grp Volume(V _g), veh/h	158	1032	131	237	276	287	184	368	90	116	188	196
Grp Sat Flow(S _g), veh/hln	1757	1752	1568	1738	1787	1857	1792	1881	1599	1792	1787	1846
Q Serve(g _s), s	6.0	22.3	4.9	5.6	9.8	9.8	6.0	14.8	3.6	5.3	7.2	7.2
Cycle Q Clear(g _c), s	6.0	22.3	4.9	5.6	9.8	9.8	6.0	14.8	3.6	5.3	7.2	7.2
Prop In Lane	1.00	1.00	1.00	1.00	0.07	1.00	1.00	1.00	1.00	1.00	1.00	0.11
Lane Grp Cap(c _g), veh/h	128	1233	552	253	629	653	130	489	416	130	465	480
W/C Ratio(X)	1.24	0.84	0.24	0.94	0.44	0.44	1.41	0.75	0.22	0.89	0.41	0.41
Avail Cap(c _a), veh/h	128	1233	552	253	629	653	130	776	659	130	737	761
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(f)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay(d), s/veh	38.2	24.5	18.9	38.0	20.5	20.5	38.2	28.1	23.9	37.9	25.2	25.2
Incr Delay(d ₂), s/veh	156.2	6.9	1.0	39.7	2.2	2.1	224.1	2.4	0.3	46.0	0.6	0.6
Initial Q Delay(d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackQ(50%), veh/h	8.4	11.9	2.2	4.1	5.2	5.4	11.1	8.0	1.6	4.3	3.6	3.8
LnGrp Delay(d ₄), s/veh	194.4	31.4	19.9	77.7	22.7	22.6	262.3	30.4	24.2	83.9	25.8	25.8
LnGrp LOS	F	C	B	E	C	C	F	C	C	F	C	C
Approach Vol, veh/h	1321											
Approach Delay, s/veh	49.8											
Approach LOS	D											
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+R ₀), s	11.0	34.0	11.0	26.4	11.0	34.0	11.0	26.4				
Change Period (Y+R ₀), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0				
Max Green Setting (G _{max}), s	6.0	29.0	6.0	34.0	6.0	29.0	6.0	34.0				
Max Q Clear Time (G _c +t ₁), s	8.0	11.8	7.3	16.8	7.6	24.3	8.0	9.2				
Green Ext Time (G _c), s	0.0	10.8	0.0	4.6	0.0	3.7	0.0	5.2				
Intersection Summary												
HCM 2010 Ctrl Delay	54.6											
HCM 2010 LOS	D											

Lanes, Volumes, Timings 53: 65th Ave & Henderson Blvd

Projected 2040 No Build
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↵	↵		↵	↵			↵			↵		
Traffic Volume (vph)	10	900	105	120	645	10	55	0	85	10	0	5	
Future Volume (vph)	10	900	105	120	645	10	55	0	85	10	0	5	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	100	0	0	150	0	0	0	0	0	0	0	0	
Storage Lanes	1	0	0	1	0	0	0	0	0	0	0	0	
Taper Length (ft)	25			25			25			25			
Right Turn on Red			Yes			Yes		Yes				Yes	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		2111			1760			704			354		
Travel Time (s)		48.0			40.0			16.0			8.0		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	0%	0%	0%	0%	0%	0%	
Shared Lane Traffic (%)													
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA		
Permitted Phases	2	2		6	6		8	8		4	4		
Detector Phase	2	2		6	6		8	8		4	4		
Switch Phase													
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0		
Minimum Spill (s)	27.5	27.5		27.5	27.5		12.5	12.5		27.5	27.5		
Total Spill (s)	52.5	52.5		52.5	52.5		27.5	27.5		27.5	27.5		
Total Split (%)	65.6%	65.6%		65.6%	65.6%		34.4%	34.4%		34.4%	34.4%		
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5		
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0		
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0		
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5		
Lead/Lag													
Lead-Lag Optimizer?													
Recall Mode	Max	Max		Max	Max		None	None		None	None		
Intersection Summary													
Area Type:	Other												
Cycle Length: 80													
Actuated Cycle Length: 71.9													
Natural Cycle: 90													
Control Type: Actuated-Uncoordinated													
Spills and Phases: 53: 65th Ave & Henderson Blvd													
02											04		
52.5 s											27.5 s		
3.5 s											3.5 s		
1.0 s											1.0 s		
06											08		
52.5 s											27.5 s		
3.5 s											3.5 s		
1.0 s											1.0 s		

HCM 2010 Signalized Intersection Summary 53: 65th Ave & Henderson Blvd

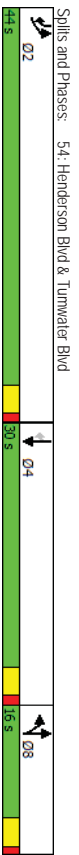
Projected 2040 No Build
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	900	105	120	645	10	55	0	85	10	0	5
Future Volume (veh/h)	10	900	105	120	645	10	55	0	85	10	0	5
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped Bike Adj(A_pb7)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/hln	1881	1881	1900	1881	1881	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	11	947	111	126	679	11	58	0	89	11	0	5
Adj No of Lanes	1	1	0	1	1	0	1	0	1	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh. %	1	1	1	1	1	1	0	0	0	0	0	0
Cap. veh/h	551	1216	143	315	1358	22	141	15	120	213	17	62
Arrive On Green	0.74	0.74	0.74	0.74	0.74	0.74	0.13	0.00	0.13	0.13	0.00	0.13
Sat Flow, veh/h	757	1653	194	536	1846	30	504	115	950	945	135	491
Grip Volume(V), veh/hln	11	0	1058	126	0	690	147	0	0	16	0	0
Grip Sat Flow(s), veh/hln	757	0	1847	536	0	1876	1568	0	0	1571	0	0
Q Serve(g.s), s	0.4	0.0	23.2	12.4	0.0	10.0	4.4	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g.c), s	10.4	0.0	23.2	35.6	0.0	10.0	5.8	0.0	0.0	0.5	0.0	0.0
Prop In Lane	1.00	0.10	1.00	0.02	0.39	0.02	0.69	0.61	0.69	0.05	0.31	0.31
Lane Grp Cap(c), veh/h	551	0	1358	315	0	1380	276	0	292	0	0	0
W/C Ratio(X)	0.02	0.00	0.78	0.40	0.00	0.50	0.53	0.00	0.05	0.00	0.00	0.00
Avail Cap(c), veh/h	551	0	1358	315	0	1380	623	0	610	0	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(f)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	5.8	0.0	5.3	16.4	0.0	3.6	27.4	0.0	0.0	25.1	0.0	0.0
Inc Delay (d2), s/veh	0.1	0.0	4.5	3.8	0.0	1.3	1.9	0.0	0.1	0.0	0.0	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOf(50%), veh/hln	0.1	0.0	13.1	2.1	0.0	0.0	5.5	2.7	0.0	0.3	0.0	0.0
LnGrp Delay(d), s/veh	5.9	0.0	9.8	20.1	0.0	4.9	29.3	0.0	0.0	25.2	0.0	0.0
LnGrp LOS	A	A	A	C	A	A	C	C	C	C	C	C
Approach Vol, veh/h	1069			816			147			16		
Approach Delay, s/veh	9.8			7.3			29.3			25.2		
Approach LOS	A			A			C			C		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	2	2	4	4	6	6	8					
Phs Duration (G+Y+Rd), s	52.5	12.8	4.5	52.5	12.8	4.5	12.8					
Change Period (Y+Rd), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5					
Max Green Sdling (Gmax), s	48.0	23.0	2.5	48.0	23.0	2.5	23.0					
Max Q Clear Time (G+ch1), s	25.2	2.5	37.6	2.5	37.6	2.5	7.8					
Green Ext Time (p.c.), s	17.9	1.0	9.1	1.0	9.1	1.0	0.9					
Intersection Summary												
HCM 2010 Crt Delay	10.3											
HCM 2010 LOS	B											

Lanes, Volumes, Timings 54: Henderson Blvd & Tumwater Blvd







Projected 2040 No Build
PM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	755	5	30	180	300	375
Future Volume (vph)	755	5	30	180	300	375
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0	0	0	100
Storage Lanes	1	0	0	0	0	1
Taper Length (ft)	25		25			
Right Turn on Red		Yes				Yes
Link Speed (mph)	35		35		35	
Link Distance (ft)	3122		2394		2111	
Travel Time (s)	60.8		46.6		41.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)						
Turn Type	Prot		Split	NA	NA	pm+ov
Permitted Phases	2		8	8	4	2
Prohibited Phases						
Detector Phase	2		8	8	4	2
Switch Phase						
Minimum Initial (s)	6.0		6.0	6.0	6.0	6.0
Minimum Spill (s)	20.5		10.5	10.5	30.0	20.5
Total Spill (s)	44.0		16.0	16.0	30.0	44.0
Total Spill (%)	48.9%		17.8%	17.8%	33.3%	48.9%
Yellow Time (s)	3.0		3.0	3.0	3.0	3.0
All-Red Time (s)	1.0		1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0		4.0	4.0	4.0	4.0
Lead-Lag Optimize?						
Recall Mode	Max		None	None	Max	Max
Intersection Summary						
Area Type:	Other					
Cycle Length: 90						
Actuated Cycle Length: 90						
Natural Cycle: 90						
Control Type: Actuated-Uncoordinated						



HCM 2010 Signalized Intersection Summary 54: Henderson Blvd & Turnwater Blvd

Projected 2040 No Build
PM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations								
Traffic Volume (veh/h)	755	5	30	180	300	375		
Future Volume (veh/h)	755	5	30	180	300	375		
Number	5	12	3	8	4	14		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped Bike Adj(A_pb7)	1.00	1.00	1.00	1.00	1.00	1.00		
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/hln	1881	1900	1900	1881	1881	1881		
Adj Flow Rate, veh/h	795	5	32	189	316	279		
Adj No of Lanes	0	0	0	1	1	1		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95		
Percent Heavy Veh. %	0	0	1	1	1	1		
Cap. veh/h	790	5	36	213	543	1173		
Arrive On Green	0.44	0.44	0.13	0.13	0.29	0.29		
Sat Flow, veh/h	1777	11	270	1597	1881	1599		
Grip Volume(V), veh/h	801	0	221	0	316	279		
Grip Sat Flow(s), veh/hln	1790	0	1868	0	1881	1599		
Q Serve(g.s), s	400	0.0	10.5	0.0	12.9	5.1		
Cycle Q Clear(g.c), s	400	0.0	10.5	0.0	12.9	5.1		
Prop In Lane	0.99	0.01	0.14	0.0	1.00	1.00		
Lane Grip Cap(c), veh/h	796	0	249	0	543	1173		
V/C Ratio(X)	1.01	0.00	0.69	0.00	0.58	0.24		
Avail Cap(c,a), veh/h	796	0	249	0	543	1173		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(f)	1.00	0.00	1.00	0.00	1.00	1.00		
Uniform Delay (d), s/veh	250	0.0	38.3	0.0	21.3	3.9		
Incr Delay (d2), s/veh	33.5	0.0	29.9	0.0	4.5	0.5		
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackQ(50%), veh/hln	27.1	0.0	7.5	0.0	7.3	6.1		
LnGrp Delay(d), s/veh	58.6	0.0	68.2	0.0	31.8	4.4		
LnGrp LOS	F	E	E	C	A	A		
Approach Vol, veh/h	801		221	595				
Approach Delay, s/veh	58.6		68.2	19.0				
Approach LOS	E		E	B				
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4				8
Phs Duration (G+Y+R), s		44.0		30.0				16.0
Change Period (Y+R), s		4.0		4.0				4.0
Max Green Setting (Gmax), s		40.0		26.0				12.0
Max Q Clear Time (Q_c+1), s		42.0		14.9				12.5
Green Ext Time (Q_c), s		0.0		2.6				0.0
Intersection Summary								
HCM 2010 Ctrl Delay				45.3				
HCM 2010 LOS				D				
Notes								

HCM 2010 TWSC 55: Henderson Blvd & Trails End Dr

Projected 2040 No Build
PM Peak Hour

Intersection									
Int Delay, s/veh			4						
Movement									
	NWL	NWR	NET	NER	SWL	SWT			
Traffic Vol, veh/h	80	55	170	140	110	210			
Future Vol, veh/h	80	55	170	140	110	210			
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	95	95	95	95	95	95			
Heavy Vehicles, %	0	0	1	1	1	1			
Mvmt Flow	84	58	179	147	116	221			

Major/Minor									
	Minor1		Major1		Major2				
Conflicting Flow All	706	253	0	0	326	0			
Stage 1	253	-	-	-	-	-			
Stage 2	453	-	-	-	-	-			
Critical Hdwy	6.4	6.2	-	-	4.11	-			
Critical Hdwy Sig 1	5.4	-	-	-	-	-			
Critical Hdwy Sig 2	5.4	-	-	-	-	-			
Follow-up Hdwy	3.5	3.3	-	-	2.209	-			
Pot Cap-1 Maneuver	405	791	-	-	1239	-			
Stage 1	794	-	-	-	-	-			
Stage 2	645	-	-	-	-	-			
Platoon blocked, %									
Mov Cap-1 Maneuver	362	791	-	-	1239	-			
Mov Cap-2 Maneuver	362	-	-	-	-	-			
Stage 1	794	-	-	-	-	-			
Stage 2	576	-	-	-	-	-			

Approach									
	NW		NE		SW				
HCM Control Delay, s	16.1		0		2.8				
HCM LOS	C								
Minor Lane/Major Mvmt									
	NET	NER	NWL	SWL	SWT				
Capacity (veh/h)	-	-	465	1239	-				
HCM Lane V/C Ratio	-	-	0.306	0.093	-				
HCM Control Delay (s)	-	-	16.1	8.2	0				
HCM Lane LOS	-	-	C	A	A				
HCM 95th %ile Q(veh)	-	-	1.3	0.3	-				

Lanes, Volumes, Timings

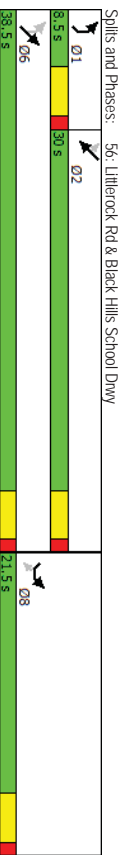
Projected 2040 No Build
PM Peak Hour

HCM 2010 Signalized Intersection Summary

Projected 2040 No Build
PM Peak Hour

Lane Group	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Volume (vph)	5	10	15	275	535	70
Future Volume (vph)	5	10	15	275	535	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200	0	175			350
Storage Lanes	1	1	1			1
Taper Length (ft)	25		25			
Right Turn on Red		Yes				Yes
Link Speed (mph)	30			30	30	
Link Distance (ft)	1065			1067	3970	
Travel Time (s)	24.2			24.3	90.2	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	1%	1%	1%	1%
Shared Lane Traffic (%)						
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	8	8	6	6	2	2
Permitted Phases						
Detector Phase	8	8	1	6	2	2
Switch Phase						
Minimum Initial (s)	7.0	7.0	4.0	7.0	7.0	7.0
Minimum Spill (s)	21.5	21.5	8.5	24.5	27.5	27.5
Total Split (s)	21.5	21.5	8.5	38.5	30.0	30.0
Total Split (%)	35.8%	35.8%	14.2%	64.2%	50.0%	50.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag			Lead	Lag	Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	Max	None	None
Intersection Summary						
Area Type:	Other					
Cycle Length:	60					
Actuated Cycle Length:	53.4					
Natural Cycle:	60					
Control Type:	Actuated-Uncoordinated					

Movement	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Volume (veh/h)	5	10	15	275	535	70
Future Volume (veh/h)	5	10	15	275	535	70
Number	3	18	1	6	2	12
Initial Q (Ob.) veh	0	0	0	0	0	0
Ped Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/hln	1900	1881	1881	1881	1881	1881
Adj Flow Rate, veh/h	5	11	16	289	563	74
Adj No. of Lanes	1	1	1	1	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh. %	0	0	1	1	1	1
Cap. veh/h	51	46	590	1445	1224	1040
Arrive On Green	0.03	0.03	0.02	0.77	0.65	0.65
Sat Flow, veh/h	1810	1615	1792	1881	1881	1599
Gp Volume(V), veh/h	5	11	16	289	563	74
Gp Sat Flow(S), veh/hln	1810	1615	1792	1881	1881	1599
Q Serve(S), s	0.1	0.3	0.1	1.9	6.6	0.8
Cycle Q Clear(g.c), s	0.1	0.3	0.1	1.9	6.6	0.8
Prop. in Lane	1.00	1.00	1.00			1.00
Lane Gp Cap(c), veh/h	51	46	590	1445	1224	1040
W/C Ratio(X)	0.10	0.24	0.03	0.20	0.46	0.07
Avail Cap(C_a), veh/h	695	620	724	1445	1224	1040
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(f)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.0	21.0	2.7	1.4	3.9	2.8
Incr Delay (d2), s/veh	0.8	2.7	0.0	0.3	0.3	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackQ(50%),veh/hln	0.1	0.2	0.1	1.0	3.4	0.3
LnGrp Delay(d), s/veh	21.8	23.7	2.7	1.7	4.2	2.9
LnGrp LOS	C	C	A	A	A	A
Approach Vol, veh/h	16					
Approach Delay, s/veh	23.1					
Approach LOS	C					
Timer	1	2	3	4	5	6
Assigned Phs	1	2				8
Phs Duration (G+Y+Rc), s	5.2	33.3				38.5
Change Period (Y+Rc), s	4.5	4.5				4.5
Max Green Setting (Gmax), s	4.0	25.5				34.0
Max O Clear Time (g_c+1), s	2.1	8.6				3.9
Green Ext Time (p.c.), s	0.0	6.4				8.0
Intersection Summary						
HCM 2010 Cnt Delay	3.6					
HCM 2010 LOS	A					



HCM 2010 TWSC
57: Center St & 76th Ave

Projected 2040 No Build
PM Peak Hour

Intersection	
Int Delay, s/veh	4.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	85	15	2	15	15	35	2	300	0	15	425	165
Future Vol, veh/h	85	15	2	15	15	35	2	300	0	15	425	165
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	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	3	3	3	11	11	11	1	1	1	3	3	3
Wmnt Flow	89	16	2	16	16	37	2	316	0	16	447	174

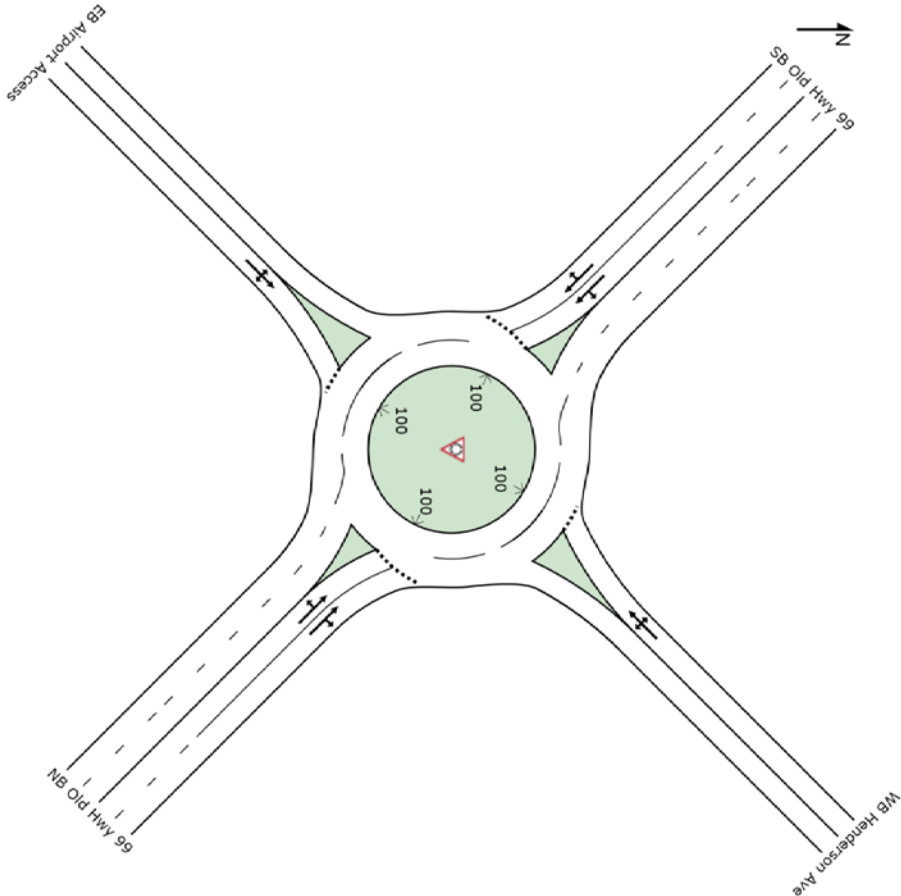
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	912	886	534	895	973	316	621	0	0	316	0	0
Stage 1	566	566	-	320	320	-	-	-	-	-	-	-
Stage 2	346	320	-	575	653	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.21	6.61	6.31	4.11	-	-	4.13	-	-
Critical Hdwy Sig 1	6.13	5.53	-	6.21	5.61	-	-	-	-	-	-	-
Critical Hdwy Sig 2	6.13	5.53	-	6.21	5.61	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.599	4.099	3.399	2.209	-	-	2.227	-	-
Poi Cap-1 Maneuver	254	282	544	252	243	704	965	-	-	1239	-	-
Stage 1	507	506	-	673	636	-	-	-	-	-	-	-
Stage 2	668	651	-	488	450	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	224	276	544	236	237	704	965	-	-	1239	-	-
Mov Cap-2 Maneuver	224	276	-	236	237	-	-	-	-	-	-	-
Stage 1	505	496	-	671	634	-	-	-	-	-	-	-
Stage 2	615	649	-	461	441	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB			
HCM Control Delay, s	33	17	0.1	0.2			
HCM LOS	D	C					
Minor Lane/Major Wmnt	NBL	NBT	NBR	EBL/WBL/NL	SBL	SBT	SBR
Capacity (veh/h)	965	-	233	368	1239	-	-
HCM Lane V/C Ratio	0.002	-	0.461	0.186	0.013	-	-
HCM Control Delay (s)	8.7	0	33	17	7.9	0	-
HCM Lane LOS	A	A	D	C	A	A	-
HCM 95th %ile Q(veh)	0	-	2.2	0.7	0	-	-

SITE LAYOUT

Site: 58) Henderson Ave at Old Hwy 99

Projected 2040 Baseline
PM Peak Hour
Roundabout



Site: 58) Henderson Ave at Old Hwy 99

Roundabout

Level of Service (LOS) Method: Delay & v/c (HCM 2010).	
Roundabout LOS Method: Same as Signalised Intersections.	
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation), per movement.	
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).	
Intersection and/or approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).	
Roundabout Capacity Model: SIDRA Standard.	
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applied.	
Gap Acceptance Capacity: SIDRA Standard (Akiyekil M30).	
IVT (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.	

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Organisation: SCJ ALLIANCE **Processed:** Thursday, June 9, 2016 1:49:59 PM
Project: N:P\Projects\0625 City of Tumwater\Transportation Master Plan\TrafficOperations\sidra2040 Baseline.c68 Henderson Ave at Old Hwy 99.spl

Projected 2040 No Build
PM Peak HourTumwater Transportation Master Plan
SCJ Alliance

HCM 2010 TWSC
60: Kimmie St & 83rd Ave

Projected 2040 No Build
PM Peak Hour

Intersection						
Int Delay, s/veh		2.1				
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	55	15	65	15	5	210
Future Vol, veh/h	55	15	65	15	5	210
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	0	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	3	3	9	9	3	3
Mvmt Flow	58	16	68	16	5	221

Major/Minor	Minor1	Major1	Major2	Minor2
Conflicting Flow All	308	76	0	84
Stage 1	76	-	-	-
Stage 2	232	-	-	-
Critical Hdwy	6.43	6.23	-	4.13
Critical Hdwy Sig 1	5.43	-	-	-
Critical Hdwy Sig 2	5.43	-	-	-
Follow-up Hdwy	3.527	3.327	-	2.227
Pot Cap-1 Maneuver	682	982	-	1506
Stage 1	944	-	-	-
Stage 2	804	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	679	982	-	1506
Mov Cap-2 Maneuver	679	-	-	-
Stage 1	944	-	-	-
Stage 2	801	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.5	0	0.2
HCM LOS	B		
Minor Lane/Major Mvmt	NBT	NBR/WBL1	SBL SBT
Capacity (veh/h)	-	727 1506	-
HCM Lane V/C Ratio	-	0.101 0.003	-
HCM Control Delay (s)	-	10.5 7.4	0
HCM Lane LOS	-	B A	A
HCM 95th %ile Q(veh)	-	0.3 0	-

HCM 2010 TWSC
61: 83rd Ave & Center St

Projected 2040 No Build
PM Peak Hour

Intersection									
Int Delay, s/veh		9.9							
Movement	EBL	EBT	WBT	WBR	SBL	SBR			
Traffic Vol, veh/h	70	15	10	140	275	80			
Future Vol, veh/h	70	15	10	140	275	80			
Conflicting Peds, #/hr	0	0	0	0	0	0			
Sign Control	Free	Free	Free	Free	Stop	Stop			
RT Channelized	-	None	-	None	-	None			
Storage Length	-	-	-	-	0	-			
Veh in Median Storage, #	-	0	0	0	0	-			
Grade, %	-	0	0	-	0	-			
Peak Hour Factor	95	95	95	95	95	95			
Heavy Vehicles, %	1	1	3	3	1	1			
Mvmt Flow	74	16	11	147	289	84			

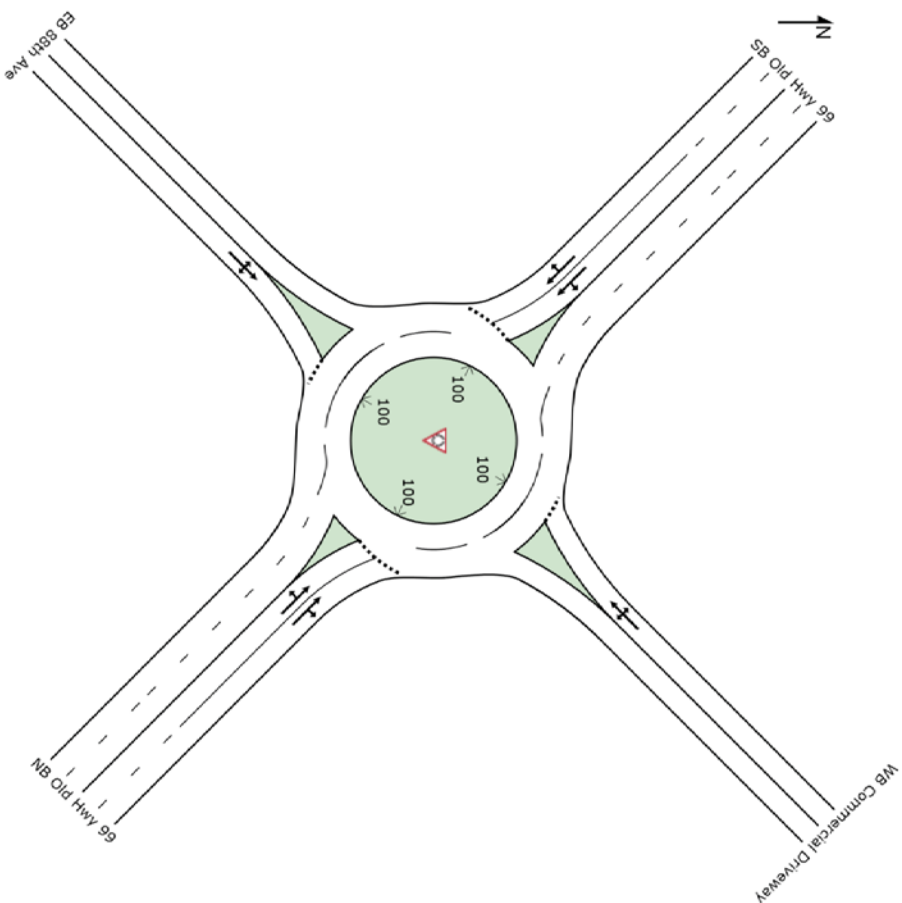
Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	158	0	247
Stage 1	-	-	84
Stage 2	-	-	163
Critical Hdwy	4.11	-	7.11
Critical Hdwy Sig 1	-	-	6.11
Critical Hdwy Sig 2	-	-	6.11
Follow-up Hdwy	2.209	-	3.509
Pot Cap-1 Maneuver	1428	-	709
Stage 1	-	-	927
Stage 2	-	-	841
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1428	-	681
Mov Cap-2 Maneuver	-	-	681
Stage 1	-	-	879
Stage 2	-	-	797

Approach	EB	WB	SB
HCM Control Delay, s	6.3	0	15
HCM LOS			C
Minor Lane/Major Mvmt	EBL	EBT	WBT WBR/SBL1
Capacity (veh/h)	1428	-	731
HCM Lane V/C Ratio	0.052	-	0.511
HCM Control Delay (s)	7.7	0	15
HCM Lane LOS	A	A	C
HCM 95th %ile Q(veh)	0.2	-	2.9

SITE LAYOUT

Site: 62) 88th Ave at Old Hwy 99

Projected 2040 Baseline
PM Peak Hour
Roundabout



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MOVEMENT SUMMARY

Site: 62) 88th Ave at Old Hwy 99

Projected 2040 Baseline
PM Peak Hour
Roundabout

Movement Performance - Vehicles										
Mov	OD	Demand Flows		Deg.	Average	Level of	95% Back of Queue	Prop.	Effective	Average
ID	Mov	Total	HV	Sam	Delay	Service	Vehicles	Distance	Stop Rate	Speed
		veh/h	%	w/c	sec		veh	ft	Queued	per veh
SouthEast: NB Old Hwy 99										
3x	L2	5	1.0	0.189	5.1	LOS A	1.2	29.3	0.50	0.34
8x	T1	421	1.0	0.189	4.9	LOS A	1.2	30.2	0.50	0.33
18x	R2	1	1.0	0.189	4.7	LOS A	1.2	30.2	0.49	0.32
Approach										
		427	1.0	0.189	4.9	LOS A	1.2	30.2	0.50	0.33
NorthEast: WB Commercial Driveway										
1x	L2	5	2.0	0.016	5.2	LOS A	0.1	1.6	0.53	0.39
6x	T1	5	2.0	0.016	5.2	LOS A	0.1	1.6	0.53	0.39
16x	R2	1	2.0	0.016	5.2	LOS A	0.1	1.6	0.53	0.39
Approach										
		12	2.0	0.016	5.2	LOS A	0.1	1.6	0.53	0.39
NorthWest: SB Old Hwy 99										
7x	L2	1	1.0	0.525	8.0	LOS A	4.9	123.9	0.16	0.04
4x	T1	979	1.0	0.525	7.9	LOS A	4.9	123.9	0.16	0.04
14x	R2	537	1.0	0.525	7.7	LOS A	4.9	123.8	0.15	0.04
Approach										
		1517	1.0	0.525	7.8	LOS A	4.9	123.9	0.16	0.04
SouthWest: EB 88th Ave										
5x	L2	253	3.0	0.462	13.1	LOS B	2.5	64.5	0.73	0.79
2x	T1	5	3.0	0.462	13.1	LOS B	2.5	64.5	0.73	0.79
12x	R2	26	3.0	0.462	13.1	LOS B	2.5	64.5	0.73	0.79
Approach										
		284	3.0	0.462	13.1	LOS B	2.5	64.5	0.73	0.79
All Vehicles										
		2240	1.3	0.525	7.9	LOS A	4.9	123.9	0.30	0.19
										33.1

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: SIDRA Standard.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: SIDRA Standard (Alceik MSD).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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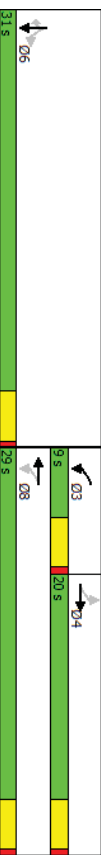
Lanes, Volumes, Timings

Projected 2040 No Build
PM Peak Hour

63: I-5 SB Ramps & 93rd Ave

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	415	95	85	305	0	0	0	0	475	0	425
Future Volume (vph)	0	415	95	85	305	0	0	0	0	475	0	425
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0	150	0	0	0	0	0	0	300	1
Storage Lanes	0	0	0	1	0	0	0	0	0	0	1	1
Taper Length (ft)	25			25			25			25		
Right Turn on Red		Yes			Yes			Yes			Yes	
Link Speed (mph)		30			40			30			30	
Link Distance (ft)		1124			936			1099			1644	
Travel Time (s)		25.5			16.0			25.0			37.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	1%	1%	9%	9%	9%	0%	0%	0%	4%	4%	4%
Shared Lane Traffic (%)												
Turn Type	NA			pm+pl	NA					NA	NA	Perm
Protected Phases		4		3	8					6	6	6
Permitted Phases		4		8	8					6	6	6
Detector Phase	4	4		3	8					6	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0			4.0	4.0	4.0	4.0	4.0
Minimum Spill (s)	20.0	20.0		8.0	20.0			20.0	20.0	20.0	20.0	20.0
Total Split (s)	20.0	20.0		9.0	29.0			31.0	31.0	31.0	31.0	31.0
Total Split (%)	33.3%	33.3%		15.0%	48.3%			51.7%	51.7%	51.7%	51.7%	51.7%
Yellow Time (s)	3.5	3.5		3.5	3.5			3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5		0.5	0.5			0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0		4.0	4.0			4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lag	Lag		Lead	Lead							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	None		None	None			Max	Max	Max	Max	Max

Splits and Phases: 63: I-5 SB Ramps & 93rd Ave



HCM 2010 Signalized Intersection Summary

Projected 2040 No Build
PM Peak Hour

63: I-5 SB Ramps & 93rd Ave

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	415	95	85	305	0	0	0	0	475	0	425
Future Volume (veh/h)	0	415	95	85	305	0	0	0	0	475	0	425
Number	7	4	14	3	8	18	0	0	0	1	6	16
Initial Q (Qb) veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped Bike Adj(A_pbT)	1.00		1.00	1.00	1.00	1.00		1.00		1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		1.00		1.00	1.00	1.00
Adj Sat Flow, veh/hln	1900	1881	1900	1743	1743	0		1900		1827	1827	1827
Adj Flow Rate, veh/h	0	437	100	89	321	0		500		0	268	0
Adj No. of Lanes	0	1	0	1	1	0		1		0	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95		0.95		0.95	0.95	0.95
Percent Heavy Veh. %	1	1	1	9	9	0		4		4	4	4
Cap. veh/h	0	408	93	213	694	0		808		0	721	0
Arrive On Green	0.00	0.28	0.28	0.05	0.40	0.00		0.46		0.00	0.46	0.46
Sat Flow, veh/h	0	1482	339	1660	1743	0		1740		0	1553	0
Gp Volume(v), veh/h	0	0	537	89	321	0		500		0	268	0
Gp Sat Flow(s), veh/hln	0	0	1821	1660	1743	0		1740		0	1553	0
Q Serve(g), s	0.0	0.0	16.0	2.1	7.9	0.0		12.6		0.0	6.5	0.0
Cycle Q Clear(g-c), s	0.0	0.0	16.0	2.1	7.9	0.0		12.6		0.0	6.5	0.0
Prop In Lane	0.00	0.19	1.00	0.00	0.00	1.00		1.00		0.00	1.00	1.00
Lane Gp Cap(c), veh/h	0	0	501	213	694	0		808		0	721	0
V/C Ratio(X)	0.00	0.00	1.07	0.42	0.46	0.00		0.62		0.00	0.37	0.00
Avail Cap(c-a), veh/h	0	0	501	267	750	0		808		0	721	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		1.00		1.00	1.00	1.00
Upstream Filter(f)	0.00	0.00	1.00	1.00	1.00	0.00		1.00		0.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	21.1	15.2	12.9	0.0		11.7		0.0	10.1	0.0
Incr Delay (d2), s/veh	0.0	0.0	60.6	1.3	0.5	0.0		3.5		0.0	1.5	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0		0.0		0.0	0.0	0.0
%ile BackQ(50%),veh/hln	0.0	0.0	16.4	1.0	3.8	0.0		6.8		0.0	3.0	0.0
LnGrp Delay(d), s/veh	0.0	0.0	81.7	16.5	13.4	0.0		15.2		0.0	11.5	0.0
LnGrp LOS			F	B	B			B			B	
Approach Vol, veh/h		537			410			768			14.0	
Approach Delay, s/veh		81.7			14.1			14.0			14.0	
Approach LOS		F			B			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Pks		3						8				
Pks Duration (G+Y+Rc), s		7.1		20.0		31.0		27.1				
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0				
Max Green Setting (Gmax), s		5.0		16.0		27.0		25.0				
Max Q Clear Time (q_c+H), s		4.1		18.0		14.6		9.9				
Green Ext Time (p_c), s		0.0		0.0		3.5		4.9				

HCM 2010 TWSC
64: I-5 NB Ramps & 93rd Ave

Projected 2040 No Build
PM Peak Hour

Intersection													
Int Delay, s/veh													
18.6													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Traffic Vol, veh/h	290	555	0	290	425	0	130	0	155	0	0	0	
Future Vol, veh/h	290	555	0	0	290	425	130	0	155	0	0	0	
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	-	-	Yield	-	-	Yield	-	-	None	
Storage Length	125	-	-	-	-	300	-	-	-	-	-	-	
Vel in Median Storage, #	-	0	-	-	0	-	-	0	-	-	-	-	
Grade, %	-	0	-	-	0	-	-	0	-	-	-	0	
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95	
Heavy Vehicles, %	3	3	3	8	8	8	14	14	14	0	0	0	
Mvmt Flow	305	584	0	0	305	447	137	0	163	0	0	0	

Major/Minor	Major1	Major2			Minor1		
Conflicting Flow All	305	0	-	-	0	1500	1500
Stage 1	-	-	-	-	-	1195	1195
Stage 2	-	-	-	-	-	305	305
Critical Hdwy	4.13	-	-	-	-	6.54	6.64
Critical Hdwy Sig 1	-	-	-	-	-	5.54	5.64
Critical Hdwy Sig 2	-	-	-	-	-	5.54	5.64
Follow-up Hdwy	2.227	-	-	-	-	3.626	4.126
Pot Cap-1 Maneuver	1250	0	0	-	-	126	115
Stage 1	-	0	0	-	-	271	246
Stage 2	-	0	0	-	-	721	641
Platoon blocked, %	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1250	-	-	-	-	-	95
Mov Cap-2 Maneuver	-	-	-	-	-	-	95
Stage 1	-	-	-	-	-	205	0
Stage 2	-	-	-	-	-	721	0

Approach	EB			WB			NB		
HCM Control Delay, s	3			0			111.6		
HCM LOS	F						F		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR		
Capacity (veh/h)	282	1250	-	-	-	-	-		
HCM Lane V/C Ratio	1.064	0.244	-	-	-	-	-		
HCM Control Delay (s)	111.6	8.8	-	-	-	-	-		
HCM Lane LOS	F	A	-	-	-	-	-		
HCM 95th %ile Q(veh)	11.8	1	-	-	-	-	-		

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

HCM 2010 TWSC
65: Kimmie St & 93rd Ave

Projected 2040 No Build
PM Peak Hour

Intersection													
Int Delay, s/veh													
4.6													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Traffic Vol, veh/h	55	535	5	5	475	15	15	1	10	30	15	110	
Future Vol, veh/h	55	535	5	5	475	15	15	1	10	30	15	110	
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	-	-	-	-	-	-	-	-	-	-	-	-	
Vel in Median Storage, #	-	0	-	-	0	-	-	0	-	-	-	0	
Grade, %	-	0	-	-	0	-	-	0	-	-	-	0	
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95	
Heavy Vehicles, %	4	4	4	4	1	1	1	1	0	0	5	5	
Mvmt Flow	58	563	5	5	500	16	16	1	11	32	16	116	

Major/Minor	Major1	Major2			Minor1		
Conflicting Flow All	516	0	0	568	0	0	1266
Stage 1	-	-	-	-	-	-	682
Stage 2	-	-	-	-	-	-	584
Critical Hdwy	4.14	-	-	4.11	-	-	7.1
Critical Hdwy Sig 1	-	-	-	-	-	-	6.1
Critical Hdwy Sig 2	-	-	-	-	-	-	6.1
Follow-up Hdwy	2.236	-	-	2.209	-	-	3.5
Pot Cap-1 Maneuver	1040	-	-	1009	-	-	147
Stage 1	-	-	-	-	-	-	443
Stage 2	-	-	-	-	-	-	501
Platoon blocked, %	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1040	-	-	1009	-	-	101
Mov Cap-2 Maneuver	-	-	-	-	-	-	101
Stage 1	-	-	-	-	-	-	407
Stage 2	-	-	-	-	-	-	383

Approach	EB			WB			NB		
HCM Control Delay, s	0.8			0.1			34.3		
HCM LOS	D						D		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBn1	
Capacity (veh/h)	150	1040	-	-	1009	-	-	313	
HCM Lane V/C Ratio	0.182	0.056	-	-	0.005	-	-	0.521	
HCM Control Delay (s)	34.3	8.7	0	8.6	0	-	-	28.4	
HCM Lane LOS	D	A	A	A	A	A	A	D	
HCM 95th %ile Q(veh)	0.6	0.2	-	-	0	-	-	2.8	

HCM 2010 AWSC
66: Case Rd & 93rd Ave

Projected 2040 No Build
PM Peak Hour

Intersection													
Intersection Delay, s/veh		53.3											
Intersection LOS		F											
Movement													
Traffic Vol, veh/h	0	2	435	140	0	240	360	65	0	85	35	50	50
Future Vol, veh/h	0	2	435	140	0	240	360	65	0	85	35	50	50
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	2	3	3	3	2	2	2	2	2	0	0	0	0
Mvmt Flow	0	2	458	147	0	253	379	68	0	89	37	53	53
Number of Lanes	0	0	1	0	0	0	1	1	0	0	1	0	0
Approach													
Approach		EB			WB			NE					
Opposing Approach		WB			EB			SW					
Opposing Lanes		2			1			1					
Conflicting Approach Left		SW			NE			EB					
Conflicting Lanes Left		1			1			1					
Conflicting Approach Right		NE			SW			WB					
Conflicting Lanes Right		1			1			2					
HCM Control Delay		65.8			62.9			16.9					
HCM LOS		F			F			C					
Lane													
Lane		NE		EB		WB		WB		WB		SW	
Vol Left, %		50%		0%		40%		0%		63%			
Vol Thru, %		21%		75%		60%		0%		36%			
Vol Right, %		29%		24%		0%		100%		0%			
Sign Control		Stop		Stop		Stop		Stop		Stop			
Traffic Vol by Lane		170		577		600		65		221			
LT Vol		85		2		240		0		140			
Through Vol		35		435		360		0		80			
RT Vol		50		140		0		65		1			
Lane Flow Rate		179		607		632		68		233			
Geometry C/P		2		5		7		7		2			
Degree of Util (X)		0.408		1		1		0.127		0.526			
Departure Headway (Hd)		8.218		6.931		7.562		6.66		8.139			
Convergence, Y/N		Yes		Yes		Yes		Yes		Yes			
Cap		437		528		486		542		442			
Service Time		6.286		4.931		5.262		4.36		6.196			
HCM Lane V/C Ratio		0.41		1.15		1.3		0.125		0.527			
HCM Control Delay		16.9		65.8		68.6		10.3		19.9			
HCM Lane LOS		C		F		B		C					
HCM 95th-ile Q		1.9		14		13.4		0.4		3			

HCM 2010 AWSC
66: Case Rd & 93rd Ave

Projected 2040 No Build
PM Peak Hour

Intersection				
Intersection Delay, s/veh				
Intersection LOS				
Movement				
	SWU	SWL	SWT	SWR
Traffic Vol, veh/h	0	140	80	1
Future Vol, veh/h	0	140	80	1
Peak Hour Factor	0.95	0.95	0.95	0.95
Heavy Vehicles, %	2	1	1	1
Mvmt Flow	0	147	84	1
Number of Lanes	0	0	1	0
Approach				
	SW			
Opposing Approach				
	NE			
Opposing Lanes	1			
Conflicting Approach Left	WB			
Conflicting Lanes Left	2			
Conflicting Approach Right	EB			
Conflicting Lanes Right	1			
HCM Control Delay	19.9			
HCM LOS	C			
Lane				

HCM 2010 AWSC
67: Tilley Rd (South) & 93rd Ave

Projected 2040 No Build
PM Peak Hour

Intersection										
Intersection Delay, s/veh	53.5									
Intersection LOS	F									
Movement	EBU	EBT	EBR	WBU	WBL	WBT	NBU	NBL	NBR	
Traffic Vol, veh/h	0	385	235	0	265	485	0	170	85	85
Future Vol, veh/h	0	385	235	0	265	485	0	170	85	85
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	2	3	3	2	2	2	2	1	1	1
Mvmt Flow	0	405	247	0	279	511	0	179	89	89
Number of Lanes	0	1	0	0	0	1	0	1	0	0
Approach	EB			WB			NB			
Opposing Approach	WB			EB			NB			
Opposing Lanes	1			1			0			
Conflicting Approach Left				NB			EB			
Conflicting Lanes Left	0			1			1			
Conflicting Approach Right	NB			0			WB			
Conflicting Lanes Right	1			1			1			
HCM Control Delay	59.4			61			17.2			
HCM LOS	F			F			C			
Lane	NBLn1	EBLn1	WBLn1							
Vol Left, %	67%	0%	35%							
Vol Thru, %	0%	62%	65%							
Vol Right, %	33%	38%	0%							
Sign Control	Stop	Stop	Stop							
Traffic Vol by Lane	255	620	750							
LT Vol	170	0	265							
Through Vol	0	385	485							
RT Vol	85	235	0							
Lane Flow Rate	268	653	789							
Geometry Grp	1	1	1							
Degree of Util (X)	0.518	1	1							
Departure Headway (Hd)	6.947	5.692	5.973							
Convergence, Y/N	Yes	Yes	Yes							
Cap	523	640	616							
Service Time	4.947	3.717	3.998							
HCM Lane V/C Ratio	0.512	1.02	1.281							
HCM Control Delay	17.2	59.4	61							
HCM Lane LOS	C	F	F							
HCM 95th-ile Q	2.9	15.4	15							

HCM 2010 TWSC
68: 93rd Ave & Tilley Rd (North)

Projected 2040 No Build
PM Peak Hour

Intersection										
Int Delay, s/vch	13.4									
Movement	EBL	EBT	WBL	WBR	SBL	SBR				
Traffic Vol, veh/h	115	360	340	65	170	410				
Future Vol, veh/h	115	360	340	65	170	410				
Conflicting Peds, #/hr	0	0	0	0	0	0				
Sign Control	Free	Free	Free	Free	Stop	Stop				
RT Channelized	-	None	-	None	-	None				
Storage Length	-	-	-	-	250	0				
Veh in Median Storage, #	-	0	0	0	0	-				
Grade, %	-	0	0	-	0	-				
Peak Hour Factor	95	95	95	95	95	95				
Heavy Vehicles, %	2	2	3	3	1	1				
Mvmt Flow	121	379	358	68	179	432				
Major/Minor	Major1	Major2	Minor2							
Conflicting Flow All	426	0	1013	392	392					
Stage 1	-	-	-	-	621	-				
Stage 2	-	-	-	-	6.21	-				
Critical Hdwy	4.12	-	-	-	6.41	6.21				
Critical Hdwy Sig 1	-	-	-	-	5.41	-				
Critical Hdwy Sig 2	-	-	-	-	5.41	-				
Follow-up Hdwy	2.218	-	-	-	3.509	3.309				
Pot Cap-1 Maneuver	1133	-	-	-	266	659				
Stage 1	-	-	-	-	685	-				
Stage 2	-	-	-	-	538	-				
Platoon blocked, %	-	-	-	-	-	-				
Mov Cap-1 Maneuver	1133	-	-	-	230	659				
Mov Cap-2 Maneuver	-	-	-	-	230	-				
Stage 1	-	-	-	-	685	-				
Stage 2	-	-	-	-	465	-				
Approach	EB	WB	SB							
HCM Control Delay, s	2.1	0	31.9	D						
HCM LOS										
Minor Lane/Major Mvmt	EBL	EBT	WBL	WBR	SBLn1	SBLn2				
Capacity (veh/h)	1133	-	-	230	659	-				
HCM Lane V/C Ratio	0.107	-	-	0.778	0.655	-				
HCM Control Delay (s)	8.6	0	-	60	20.2	-				
HCM Lane LOS	A	A	-	F	C	-				
HCM 95th %ile Q(veh)	0.4	-	-	5.6	4.9	-				

Intersection									
Int Delay, s/veh		6							
Movement	EBT	EBR	WBL	WBT	NEL	NER			
Traffic Vol, veh/h	890	30	190	340	15	205			
Future Vol, veh/h	890	30	190	340	15	205			
Conflicting Peds, #/hr	0	0	0	0	0	0			
Sign Control	Free	Free	Free	Free	Stop	Stop			
RT Channelized	-	None	-	None	-	None			
Storage Length	-	450	300	-	300	0			
Veh in Median Storage, #	0	-	-	0	2	-			
Grade, %	0	-	-	-	0	-			
Peak Hour Factor	95	95	95	95	95	95			
Heavy Vehicles, %	1	1	2	2	1	1			
Mvmt Flow	937	32	200	358	16	216			

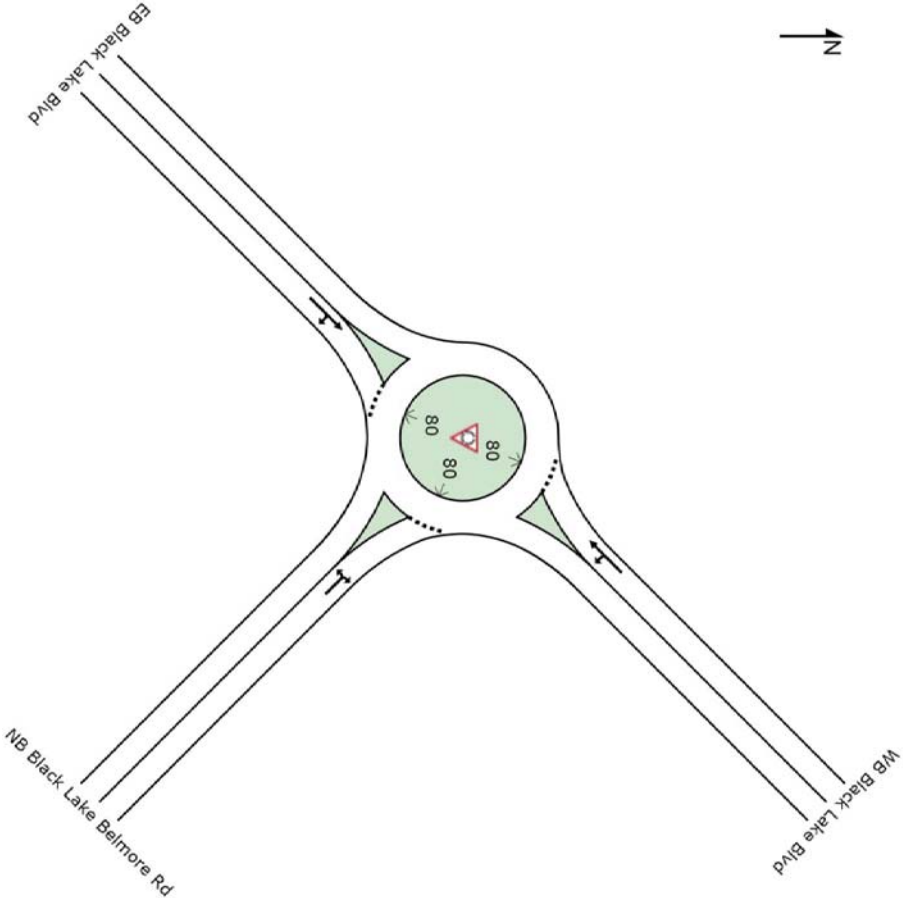
Major/Minor	Major1	Major2	Minor1	
Conflicting Flow All	0	937	0	1695
Stage 1	-	-	-	937
Stage 2	-	-	-	758
Critical Hdwy Sig 1	-	4.12	-	6.41
Critical Hdwy Sig 2	-	-	-	5.41
Follow-up Hdwy	-	2.218	-	3.509
Poi Cap-1 Maneuver	-	731	-	103
Stage 1	-	-	-	383
Stage 2	-	-	-	465
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	731	-	75
Mov Cap-2 Maneuver	-	-	-	250
Stage 1	-	-	-	383
Stage 2	-	-	-	338

Approach	EB	WB	NE	
HCM Control Delay, s	0	4.2	35.1	
HCM LOS			E	
Minor Lane/Major Mvmt	NELn1	NELn2	EBT	EBR
Capacity (veh/h)	290	322	-	731
HCM Lane v/c Ratio	0.063	0.67	-	0.274
HCM Control Delay (s)	20.4	36.2	-	11.8
HCM Lane LOS	C	E	-	B
HCM 95th %ile D(veh)	0.2	4.5	-	1.1

SITE LAYOUT

Site: 6) Black Lake Belmore Rd at Black Lake Blvd

Projected 2040 with Improvements
PM Peak Hour
Roundabout



MOVEMENT SUMMARY

Site: 6) Black Lake Belmore Rd at Black Lake Blvd

Projected 2040 with Improvements
PM Peak Hour
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
SouthEast: NB Black Lake Belmore Rd											
3x	L2	221	1.0	0.457	8.8	LOSA	3.4	86.2	0.57	0.40	31.7
18x	R2	242	1.0	0.457	8.8	LOSA	3.4	86.2	0.57	0.40	30.9
Approach		463	1.0	0.457	8.8	LOSA	3.4	86.2	0.57	0.40	31.3
NorthEast: WB Black Lake Blvd											
1x	L2	263	0.0	0.674	13.8	LOSB	7.3	182.6	0.75	0.58	29.9
6x	T1	432	0.0	0.674	13.8	LOSB	7.3	182.6	0.75	0.58	29.9
Approach		695	0.0	0.674	13.8	LOSB	7.3	182.6	0.75	0.58	29.9
SouthWest: EB Black Lake Blvd											
2x	T1	200	3.0	0.313	7.2	LOSA	2.1	52.5	0.57	0.42	33.5
12x	R2	89	3.0	0.313	7.2	LOSA	2.1	52.5	0.57	0.42	32.7
Approach		289	3.0	0.313	7.2	LOSA	2.1	52.5	0.57	0.42	33.2
All Vehicles		1447	0.9	0.674	10.9	LOSB	7.3	182.6	0.66	0.49	30.9

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik MSD).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SimTraffic Performance Report

Projected 2040 With Improvements
PM Peak Hour

13: 2nd Ave/US 101/I-5 Off-Ramps Performance by movement

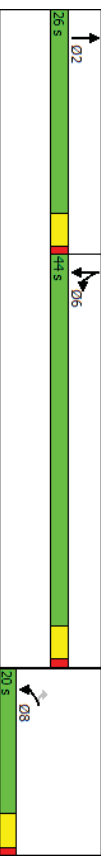
Movement	EBR	NBL	NBT	SBT	SBR	ALL
Denied Del/Veh (s)	0.2	0.0	0.0	1.3	1.8	0.9
Total Del/Veh (s)	0.7	0.9	0.8	49.8	43.1	33.1

Lanes, Volumes, Timings 14: 2nd Ave & Custer Way

Projected 2040 with Imp
PM Peak Hour







Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	235	260	15	320	915	310
Future Volume (vph)	235	260	15	320	915	310
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	225	0	0	0	0
Storage Lanes	1	1	1	0	1	1
Taper Length (ft)	25				25	
Right Turn on Red		Yes		Yes		
Link Speed (mph)	30		30		30	
Link Distance (ft)	662		2035		505	
Travel Time (s)	15.0		46.3		11.5	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	1%	1%	1%	0%	0%
Shared Lane Traffic (%)					34%	
Turn Type	Prot	Perm	NA		Split	NA
Protected Phases	8		2		6	6
Permitted Phases	8	8	2		6	6
Detector Phase	8	8	2		6	6
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0		4.0	4.0
Minimum Spill (s)	100	10.0	24.5		20.0	20.0
Total Spill (s)	20.0	20.0	26.0		44.0	44.0
Total Split (%)	22.2%	28.9%			48.9%	48.9%
Yellow Time (s)	3.5	3.5	3.5		3.5	3.5
All-Red Time (s)	1.0	1.0	1.0		1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5		4.5	4.5
Lead-Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	None		Max	Max
Intersection Summary						
Area Type:	Other					
Cycle Length:	90					
Actuated Cycle Length:	74.5					
Natural Cycle:	80					
Control Type:	Actuated-Uncoordinated					

Splits and Phases: 14: 2nd Ave & Custer Way



HCM 2010 Signalized Intersection Summary 14: 2nd Ave & Custer Way

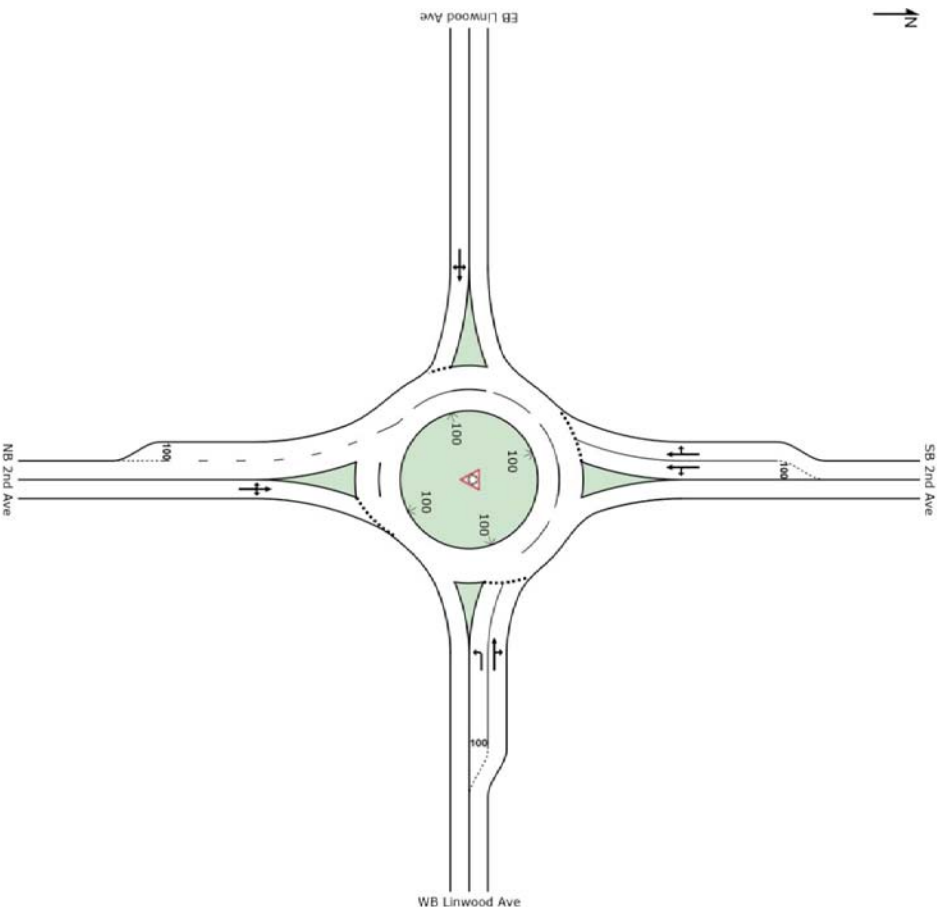
Projected 2040 with Imp
PM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT		
Lane Configurations								
Traffic Volume (veh/h)	235	260	15	320	915	310		
Future Volume (veh/h)	235	260	15	320	915	310		
Number	3	18	2	12	1	6		
Initial Q (Ob), veh	0	0	0	0	0	0		
Ped Bike Adj(A_pbT)	1.00	1.00	1.00	1.00	1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/hln	1881	1881	1881	1900	1900	1900		
Adj Flow Rate, veh/h	247	121	16	184	644	772		
Adj No. of Lanes	1	1	1	0	1	1		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95		
Percent Heavy Veh. %	1	1	1	1	0	0		
Cap. veh/h	291	260	20	224	926	972		
Arrive On Green	0.16	0.16	0.15	0.15	0.51	0.51		
Sat Flow, veh/h	1792	1599	129	1489	1810	1900		
Gp Volume(v), veh/h	247	121	0	200	644	772		
Gp Sat Flow(s), veh/hln	1792	1599	0	1618	1810	1900		
Q Serve(g.s), s	10.3	5.3	0.0	9.2	20.8	25.8		
Cycle Q Clear(g.c), s	10.3	5.3	0.0	9.2	20.8	25.8		
Prop In Lane	1.00	1.00	0.92	1.00				
Lane Gp Cap(c), veh/h	291	260	0	244	926	972		
V/C Ratio(X)	0.85	0.47	0.00	0.82	0.70	0.79		
Avail Cap(C_a), veh/h	360	321	0	451	926	972		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(f)	1.00	1.00	0.00	1.00	1.00	1.00		
Uniform Delay (d), s/veh	31.4	29.3	0.0	31.8	14.3	15.5		
Incr Delay (d2), s/veh	12.3	0.5	0.0	2.6	4.3	6.7		
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackQ(50%), veh/h	6.1	2.4	0.0	4.3	11.3	15.1		
LnGrp Delay(d), s/veh	43.7	29.8	0.0	34.4	18.6	22.1		
LnGrp LOS	D	C		C	B	C		
Approach Vol, veh/h	368		200		1416			
Approach Delay, s/veh	39.1		34.4		20.5			
Approach LOS	D		C		C			
Timer	1	2	3	4	5	6	7	8
Assigned Pts		2				6		8
Pts Duration (G+Y+Rc), s		16.1				44.0		17.1
Change Period (Y+Rc), s		4.5				4.5		4.5
Max Green Setting (Gmax), s		21.5				39.5		15.5
Max Q Clear Time (q_c+1), s		11.2				27.8		12.3
Green Ext Time (p.c), s		0.5				6.1		0.2
Intersection Summary								
HCM 2010 Crt Delay	25.4							
HCM 2010 LOS	C							
Notes								

SITE LAYOUT

Site: 25) Linwood Ave at 2nd Ave

Projected 2040 with Improvements
PM Peak Hour
Roundabout



MOVEMENT SUMMARY

Site: 25) Linwood Ave at 2nd Ave

Projected 2040 with Improvements
PM Peak Hour
Roundabout

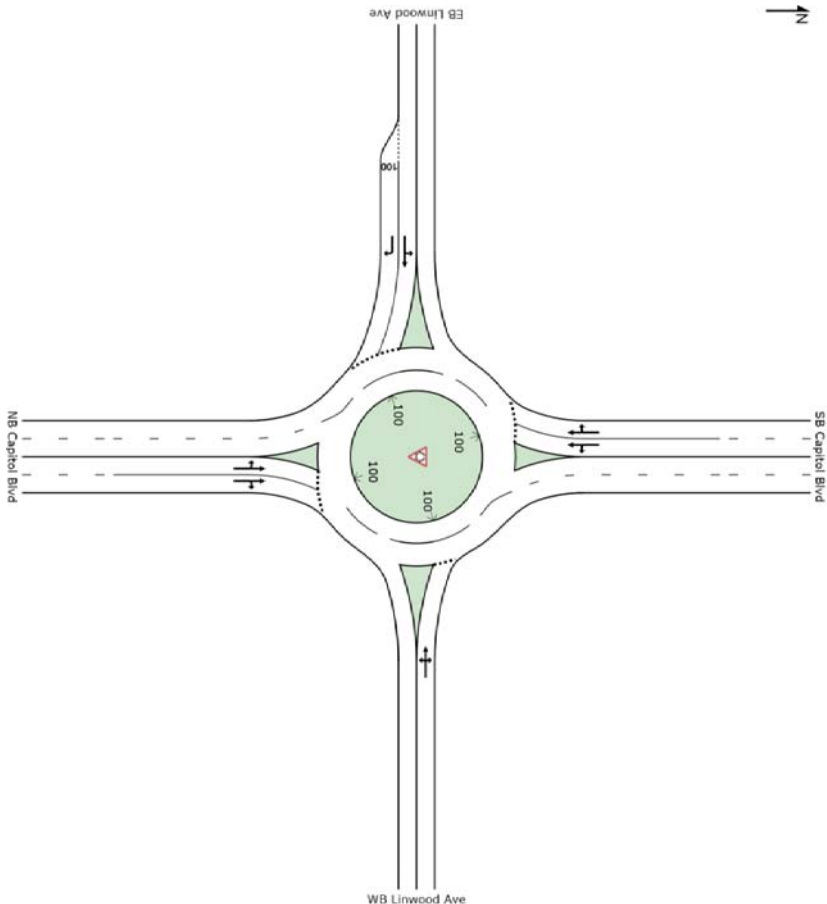
Movement Performance - Vehicles										
Mov ID	OD Mov	Demand Flows Total HV veh/h	W/C %	Deg. Satm w/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance Queued ft	Prop. Queued	Effective Stop Rate per veh
South: NB 2nd Ave										
3	L2	189	2.0	0.780	23.6	LOS C	9.4	239.8	0.93	1.07
8	T1	321	2.0	0.780	23.6	LOS C	9.4	239.8	0.93	1.07
18	R2	68	2.0	0.780	23.6	LOS C	9.4	239.8	0.93	1.07
Approach										
East: WB Linwood Ave										
1	L2	263	2.0	0.401	11.1	LOS B	2.8	72.4	0.84	0.79
6	T1	321	2.0	0.479	10.8	LOS B	4.1	103.6	0.88	0.82
16	R2	68	2.0	0.479	10.8	LOS B	4.1	103.6	0.88	0.82
Approach										
North: SB 2nd Ave										
7	L2	189	2.0	0.679	17.0	LOS B	5.5	140.7	0.84	0.94
4	T1	347	2.0	0.679	17.0	LOS B	5.5	140.7	0.84	0.94
14	R2	189	2.0	0.359	12.4	LOS B	1.7	43.8	0.71	0.72
Approach										
West: EB Linwood Ave										
5	L2	137	2.0	0.803	33.0	LOS C	9.7	246.5	1.00	1.27
2	T1	153	2.0	0.803	33.0	LOS C	9.7	246.5	1.00	1.27
12	R2	137	2.0	0.803	33.0	LOS C	9.7	246.5	1.00	1.27
Approach										
All Vehicles										
		2384	2.0	0.803	19.4	LOS B	9.7	246.5	0.89	0.98
		28.1								

Level of Service (LOS) Method: Delay & w/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and w/c ratio (degree of saturation) per movement.
LOS F will result if w/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (w/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: SIDRA Standard (Akceik MSD).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 26) Linwood Ave at Capitol Blvd

Projected 2040 With Improvements
PM Peak Hour
Roundabout



MOVEMENT SUMMARY

Site: 26) Linwood Ave at Capitol Blvd

Projected 2040 With Improvements
PM Peak Hour
Roundabout

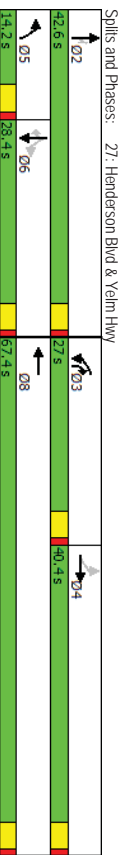
Movement Performance - Vehicles										
Mov ID	OD Mov	Demand Flows Total HV veh/h	Deg. Satm %	Average Delay sec	Level of Service	95% Back of Queue Vehicles	Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: NB Capitol Blvd										
3	L2	226	2.0	0.556	9.5	LOS A	5.3	133.8	0.56	0.34
8	T1	1147	2.0	0.556	9.1	LOS A	5.4	136.3	0.55	0.33
18	R2	16	2.0	0.556	8.9	LOS A	5.4	136.3	0.54	0.32
Approach		1389	2.0	0.556	9.2	LOS A	5.4	136.3	0.55	0.33
East: WB Linwood Ave										
1	L2	16	2.0	0.071	9.1	LOS A	0.3	7.4	0.72	0.72
6	T1	5	2.0	0.071	9.1	LOS A	0.3	7.4	0.72	0.72
16	R2	11	2.0	0.071	9.1	LOS A	0.3	7.4	0.72	0.72
Approach		32	2.0	0.071	9.1	LOS A	0.3	7.4	0.72	0.72
North: SB Capitol Blvd										
7	L2	11	2.0	0.843	22.3	LOS C	15.5	393.4	0.98	0.88
4	T1	1500	2.0	0.843	21.7	LOS C	15.5	393.4	0.97	0.86
14	R2	421	2.0	0.843	20.7	LOS C	15.5	393.2	0.96	0.82
Approach		1932	2.0	0.843	21.5	LOS C	15.5	393.4	0.97	0.85
West: EB Linwood Ave										
5	L2	121	2.0	0.427	23.1	LOS C	2.2	57.1	0.87	0.91
2	T1	5	2.0	0.427	23.1	LOS C	2.2	57.1	0.87	0.91
12	R2	268	2.0	0.648	26.5	LOS C	4.5	115.5	0.95	1.05
Approach		395	2.0	0.648	25.4	LOS C	4.5	115.5	0.92	1.00
All Vehicles		3747	2.0	0.843	17.2	LOS B	15.5	393.4	0.81	0.67
										29.3

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: SIDRA Standard (Akceik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Lanes, Volumes, Timings 27: Henderson Blvd & Yelm Hwy

Projected 2040 with Imp
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	10	955	195	510	780	85	140	200	700	230	335	30
Future Volume (vph)	10	955	195	510	780	85	140	200	700	230	335	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200	0	450	0	200	0	200	100	0	150	150	150
Storage Lanes	1	2	0	2	0	1	1	1	1	1	1	1
Taper Length (ft)	25	0	25	0	25	0	25	0	25	0	25	0
Right Turn on Red	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Link Speed (mph)	30	1947	1947	30	1645	1645	30	444	444	1606	1606	30
Link Distance (ft)	44.3	0.98	0.98	37.4	0.98	0.98	10.1	0.98	0.98	36.5	36.5	0.98
Travel Time (s)	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Peak Hour Factor	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)	Perm	NA	Prot	NA	Prot	NA	pm+ov	Perm	NA	Perm	NA	Perm
Turn Type	Protected Phases	4	3	8	5	2	2	6	6	6	6	6
Permitted Phases	4	4	3	8	5	2	2	6	6	6	6	6
Detector Phase	4	4	3	8	5	2	2	6	6	6	6	6
Switch Phase	Minimum Initial (s)	6.0	6.0	5.0	6.0	5.0	6.0	5.0	6.0	6.0	6.0	6.0
Minimum Initial (s)	24.5	24.5	9.5	24.5	9.5	24.5	9.5	24.5	24.5	24.5	24.5	24.5
Minimum Spill (s)	40.4	40.4	27.0	67.4	14.2	42.6	27.0	28.4	28.4	28.4	28.4	28.4
Total Spill (%)	36.7%	36.7%	24.5%	61.3%	12.9%	38.7%	24.5%	25.8%	25.8%	25.8%	25.8%	25.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
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	4.5
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lag
Lead-Lag Optimizer?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	Max	Max	None	Max	None	None	None	None	None	None	None	None
Area Type:	Other											
Cycle Length:	110											
Actuated Cycle Length:	109.3											
Natural Cycle:	110											
Control Type:	Actuated-Uncoordinated											



HCM 2010 Signalized Intersection Summary 27: Henderson Blvd & Yelm Hwy

Projected 2040 with Imp
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (veh/h)	10	955	195	510	780	85	140	200	700	230	335	30
Future Volume (veh/h)	10	955	195	510	780	85	140	200	700	230	335	30
Number	7	4	14	5	3	8	18	5	2	12	1	6
Initial Q (Q ₀) veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped Bike Adj (Adj _{pb})	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/hln	1881	1881	1900	1881	1881	1900	1881	1881	1881	1881	1881	1881
Adj Flow Rate, veh/h	10	974	184	520	796	82	143	204	0	235	342	5
Adj No of Lanes	1	2	0	2	2	0	1	1	1	1	1	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh. %	1	1	1	1	1	1	1	1	1	1	1	1
Cap. veh/h	274	983	185	515	1876	193	158	648	879	320	405	344
Arrive On Green	0.33	0.33	0.33	0.21	0.57	0.57	0.09	0.34	0.00	0.22	0.22	0.22
Sat Flow veh/h	635	3002	566	2508	3272	337	1792	1881	1599	1185	1881	1599
Gp Volume(v), veh/h	10	579	579	520	435	443	143	204	0	235	342	5
Gp Sat Flow(s), veh/hln	635	1787	1787	1254	1787	1822	1792	1881	1599	1185	1881	1599
Q Serve(g.s), s	1.2	36.4	36.5	22.5	15.0	15.0	8.7	8.7	0.0	21.3	19.1	0.3
Cycle Q Clear(g.c), s	1.2	35.4	35.5	22.5	15.0	15.0	8.7	8.7	0.0	21.3	19.1	0.3
Prop In Lane	1.00	0.32	1.00	0.18	1.00	0.18	1.00	1.00	1.00	1.00	1.00	1.00
Lane Gp Cap(c), veh/h	274	585	583	515	1025	1045	158	648	879	320	405	344
AVC Ratio(X)	0.04	0.99	0.99	1.01	0.42	0.42	0.90	0.31	0.00	0.73	0.85	0.01
Util Cap(C,a), veh/h	274	585	583	515	1025	1045	158	648	879	320	405	344
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Filler(f)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.2	36.7	36.8	43.6	13.2	13.2	49.5	26.4	0.0	42.2	41.3	33.9
Initial Delay (d ₂), s/veh	0.2	35.0	35.5	42.4	1.3	1.3	44.3	0.3	0.0	8.2	14.8	0.0
Initial Q Delay(d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackQ(50%), veh/h	0.2	23.1	23.1	10.7	7.7	7.9	6.2	4.6	0.0	7.7	11.6	0.1
LnGrp Delay(d), s/veh	25.5	71.7	72.2	86.0	14.5	14.5	93.9	26.7	0.0	50.4	56.1	33.9
LnGrp LOS	C	E	E	F	B	B	F	C	D	D	E	C
Approach Vol, veh/h	1168			1398			347			582		
Approach Delay, s/veh	71.6			41.1			54.4			53.6		
Approach LOS	E			D			D			D		
Timer	1	2	3	4	5	6	7	8				
Assigned Pts	2	2	3	4	5	6	8					
Pts Duration (G+Y+R ₀), s	42.3	27.0	40.4	14.2	28.1	67.4						
Change Period (Y+R ₀), s	4.5	4.5	4.5	4.5	4.5	4.5						
Max Green Setting (G _{max}), s	38.1	22.5	35.9	9.7	23.9	62.9						
Max Q Clear Time (Q ₀ +c+1), s	10.7	24.5	37.5	10.7	23.3	17.0						
Green Ext Time (p.c.), s	4.5	0.0	0.0	0.0	0.3	22.4						
Intersection Summary												
HCM 2010 Ctrl Delay	54.7											
HCM 2010 LOS	D											

HCM 2010 TWSC
28: Trosper Rd & Rural Rd

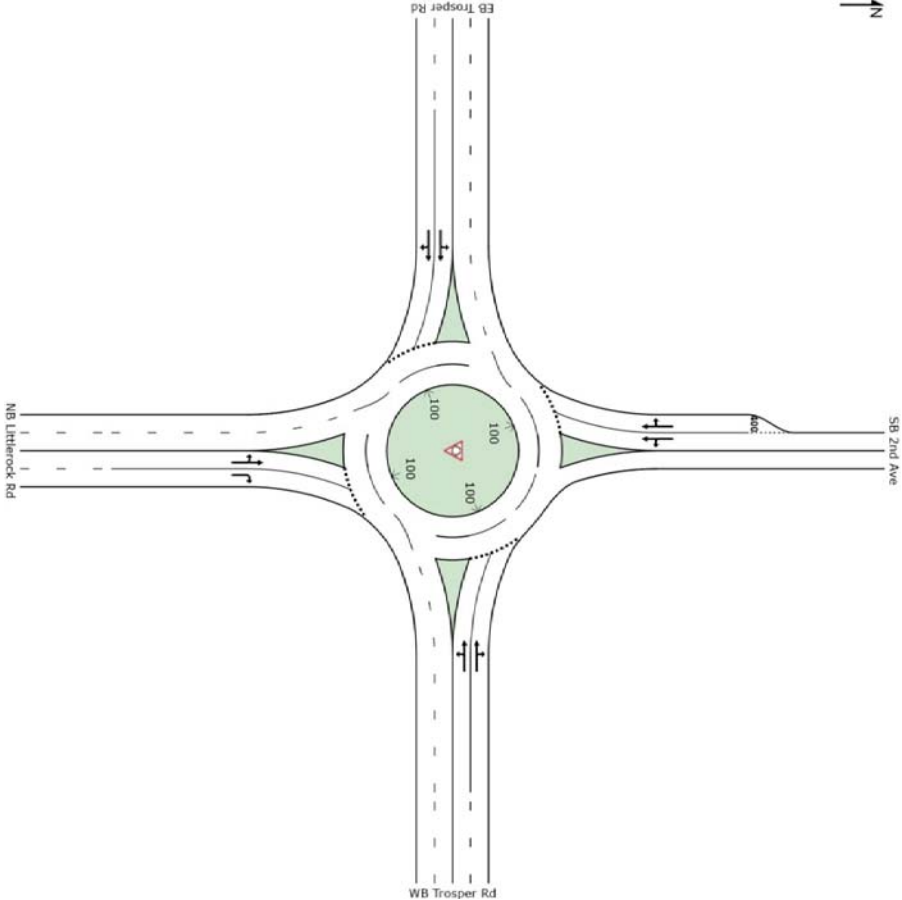
Projected 2040 with Imp
PM Peak Hour

Intersection									
Int Delay, s/veh		4.9							
Movement									
Traffic Vol, veh/h	EBL	EBT	WBT		WBR	SBL	SBR		
110	265		425	135	150	165			
Future Vol, veh/h	110	265	425	135	150	165			
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	-	-	-	150	0			
Veh in Median Storage, #	-	0	0	-	2	-			
Grade, %	-	0	-	0	-	0			
Peak Hour Factor	95	95	95	95	95	95			
Heavy Vehicles, %	0	0	1	1	2	2			
Wmnt Flow	116	279	447	142	158	174			
Major/Minor									
Conflicting Flow All	Major1	0	Minor2	-	0	1029	518		
Stage 1	-	-	-	-	-	511	-		
Stage 2	-	-	-	-	-	-	-		
Critical Hdwy	4.1	-	-	-	-	6.42	6.22		
Critical Hdwy Sig 1	-	-	-	-	-	5.42	-		
Critical Hdwy Sig 2	-	-	-	-	-	5.42	-		
Follow-up Hdwy	2.2	-	-	-	-	3.518	3.318		
Plat Cap-1 Maneuver	996	-	-	-	-	259	558		
Stage 1	-	-	-	-	-	598	-		
Stage 2	-	-	-	-	-	602	-		
Platoon blocked, %	-	-	-	-	-	-	-		
Mov Cap-1 Maneuver	996	-	-	-	-	229	558		
Mov Cap-2 Maneuver	-	-	-	-	-	427	-		
Stage 1	-	-	-	-	-	598	-		
Stage 2	-	-	-	-	-	532	-		
Approach									
EB			WB			SB			
HCM Control Delay, s	2.7		0		16.2		C		
HCM LOS									
Minor Lane/Major Wmnt									
EBL	EBT	WBT	WBR	SBL	SL	R2			
Capacity (veh/h)	996	-	-	-	427	558			
HCM Lane V/C Ratio	0.116	-	-	-	0.37	0.311			
HCM Control Delay (s)	9.1	-	-	-	18.3	14.3			
HCM Lane LOS	A	-	-	-	C	B			
HCM 95th %ile Q(veh)	0.4	-	-	-	1.7	1.3			

SITE LAYOUT

Site: 30) Trosper Rd at 2nd Ave/Littlerock Rd

Projected 2040 with Imp
PM Peak Hour
Roundabout



MOVEMENT SUMMARY

Site: 30) Trosper Rd at 2nd Ave/Littlerock Rd

Projected 2040 with Imp
PM Peak Hour
Roundabout

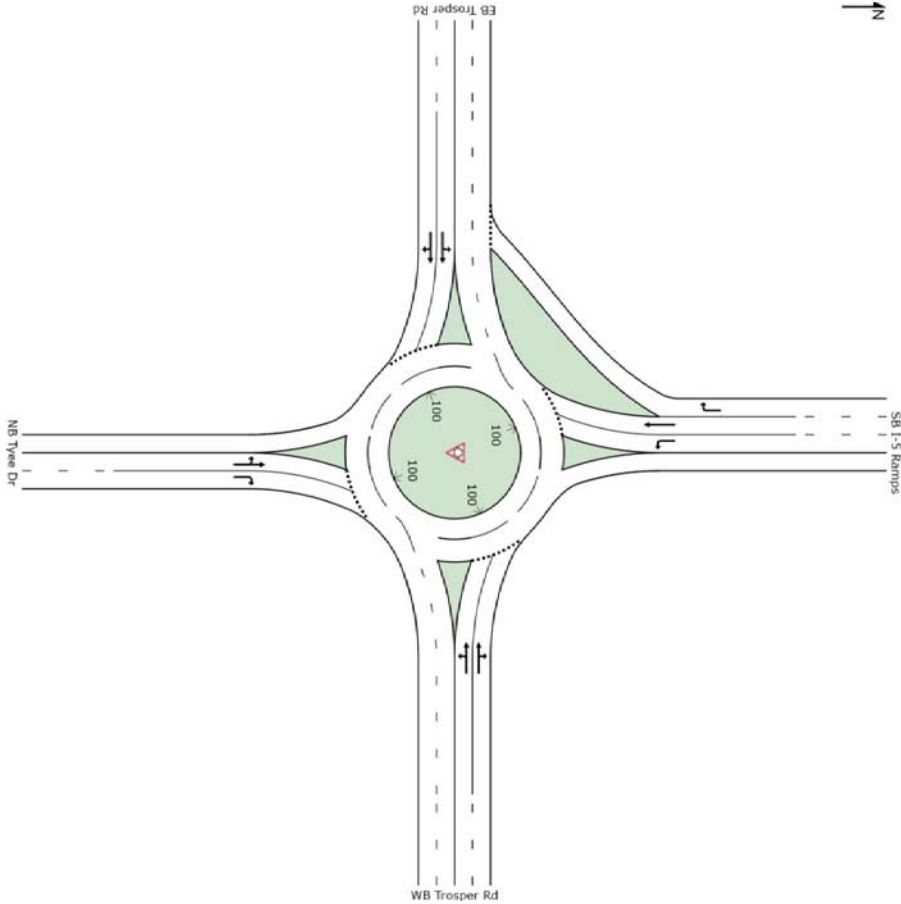
Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: NB Littlerock Rd											
3	L2	342	2.0	0.961	45.2	LOS D	18.5	469.2	1.00	1.50	21.4
8	T1	437	2.0	0.961	45.2	LOS D	18.5	469.2	1.00	1.50	21.4
18	R2	500	2.0	0.738	22.5	LOS C	6.5	164.8	0.88	1.01	26.9
Approach											
		1279	2.0	0.961	36.3	LOS D	18.5	469.2	0.95	1.31	23.2
East: WB Trosper Rd											
1	L2	453	2.0	0.853	38.8	LOS D	12.5	317.3	1.00	1.33	22.2
6	T1	384	2.0	0.853	42.1	LOS D	12.5	317.3	1.00	1.32	22.4
16	R2	21	2.0	0.853	42.1	LOS D	11.6	294.9	1.00	1.32	22.0
Approach											
		858	2.0	0.853	40.4	LOS D	12.5	317.3	1.00	1.32	22.3
North: SB 2nd Ave											
7	L2	174	2.0	0.751	30.1	LOS C	6.0	152.6	0.93	1.09	24.9
4	T1	516	2.0	0.751	27.7	LOS C	6.5	165.1	0.93	1.10	25.8
14	R2	116	2.0	0.751	26.2	LOS C	6.5	165.1	0.94	1.10	25.9
Approach											
		805	2.0	0.751	28.0	LOS C	6.5	165.1	0.93	1.10	25.6
West: EB Trosper Rd											
5	L2	89	2.0	0.636	21.2	LOS C	4.5	114.2	0.88	0.99	27.9
2	T1	458	2.0	0.636	20.0	LOS B	4.8	122.3	0.88	0.99	28.4
12	R2	184	2.0	0.636	18.5	LOS B	4.8	122.3	0.89	1.00	28.3
Approach											
		732	2.0	0.636	19.7	LOS B	4.8	122.3	0.88	0.99	28.3
All Vehicles		3674	2.0	0.961	32.1	LOS C	18.5	469.2	0.94	1.20	24.3

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik MSD).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 31) Trosper Rd at Tyee Dr/SB I-5 Ramps

Projected 2040 With Imp
PM Peak Hour
Roundabout



MOVEMENT SUMMARY

Site: 31) Trosper Rd at Tyee Dr/SB I-5 Ramps

Projected 2040 With Imp
PM Peak Hour
Roundabout

Movement Performance - Vehicles										
Mov	OD	Demand Flows	Deg	Average	Level of	95% Back of Queue	Pop.	Effective	Average	
ID	Mov	Total HV %	Sat v/c	Delay sec	Service	Vehicles Distance	Queued	Stop Rate	Speed	
South: NB Tyee Dr										
3	L2	37	2.0	0.571	25.9	LOS C	3.3	83.3	0.87	0.96
8	T1	163	2.0	0.571	25.9	LOS C	3.3	83.3	0.87	0.96
18	R2	458	2.0	0.918	50.9	LOS D	11.0	279.7	1.00	1.40
Approach		658	2.0	0.918	43.3	LOS D	11.0	279.7	0.96	1.26
East: WB Trosper Rd										
1	L2	289	2.0	0.564	11.6	LOS B	4.5	113.3	0.72	0.66
6	T1	358	2.0	0.564	11.5	LOS B	4.5	114.2	0.71	0.66
16	R2	421	2.0	0.564	11.2	LOS B	4.5	114.2	0.71	0.65
Approach		1068	2.0	0.564	11.4	LOS B	4.5	114.2	0.71	0.65
North: SB I-5 Ramps										
7	L2	405	2.0	0.472	10.2	LOS B	3.0	77.1	0.73	0.74
4	T1	453	2.0	0.426	8.0	LOS A	2.7	68.2	0.70	0.64
14	R2	500	2.0	0.399	6.8	LOS A	2.3	59.2	0.54	0.43
Approach		1358	2.0	0.472	8.2	LOS A	3.0	77.1	0.65	0.59
West: EB Trosper Rd										
5	L2	216	2.0	0.898	44.3	LOS D	10.4	264.7	0.96	1.33
2	T1	842	2.0	0.898	41.1	LOS D	11.3	288.1	0.97	1.34
12	R2	26	2.0	0.898	39.5	LOS D	11.3	288.1	0.98	1.35
Approach		1084	2.0	0.898	41.7	LOS D	11.3	288.1	0.97	1.34
All Vehicles		4168	2.0	0.918	23.3	LOS C	11.3	288.1	0.80	0.91
										26.9

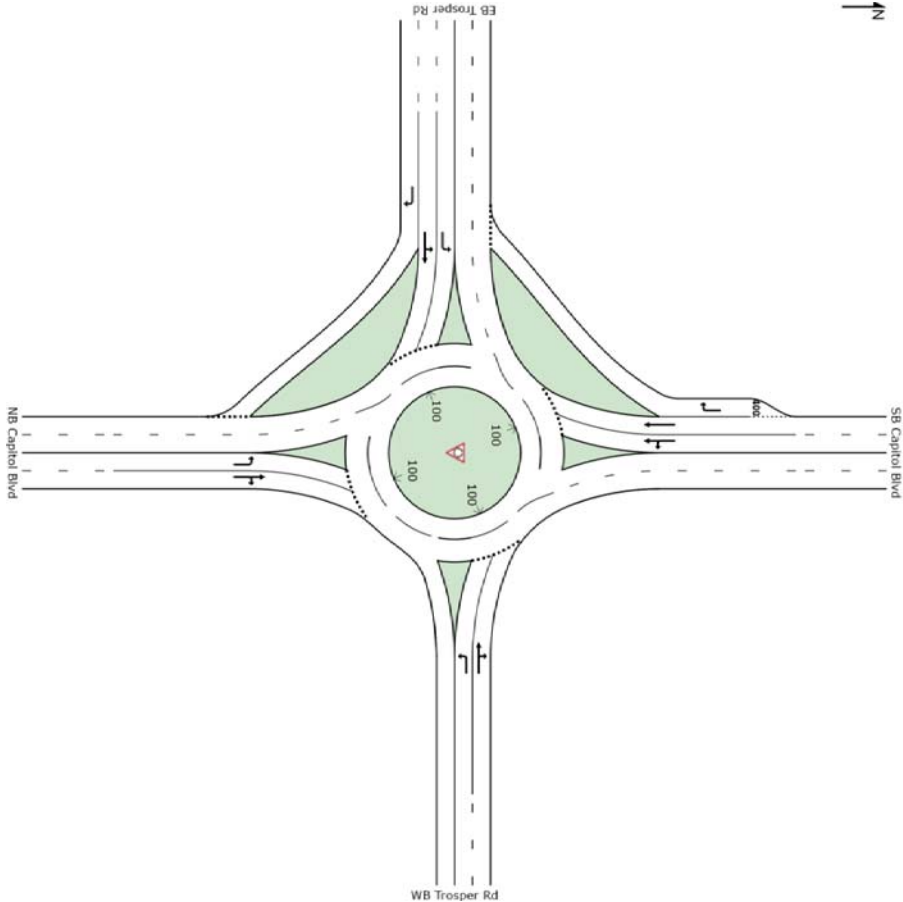
Level of Service (LOS) Method: Delay & v/c (HCM 2010).
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Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik MSD).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: N:\projects\0625 City of Tumwater\0625_17 Tumwater Transportation Master Plan\Traffic\Operations\sldra\2040 Trosper.sldp

SITE LAYOUT

Site: 33) Trosper Rd at Capitol Blvd

Projected 2040 With Improvements
PM Peak Hour
Roundabout



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Project: N:\projects\0625 City of Tumwater\0625_17 Tumwater Transportation Master Plan\Traffic\Operations\sldra\2040 With Imp\33) Trosper Rd at Capitol Blvd.sldp

MOVEMENT SUMMARY

Site: 33) Trosper Rd at Capitol Blvd

Projected 2040 With Improvements
PM Peak Hour
Roundabout

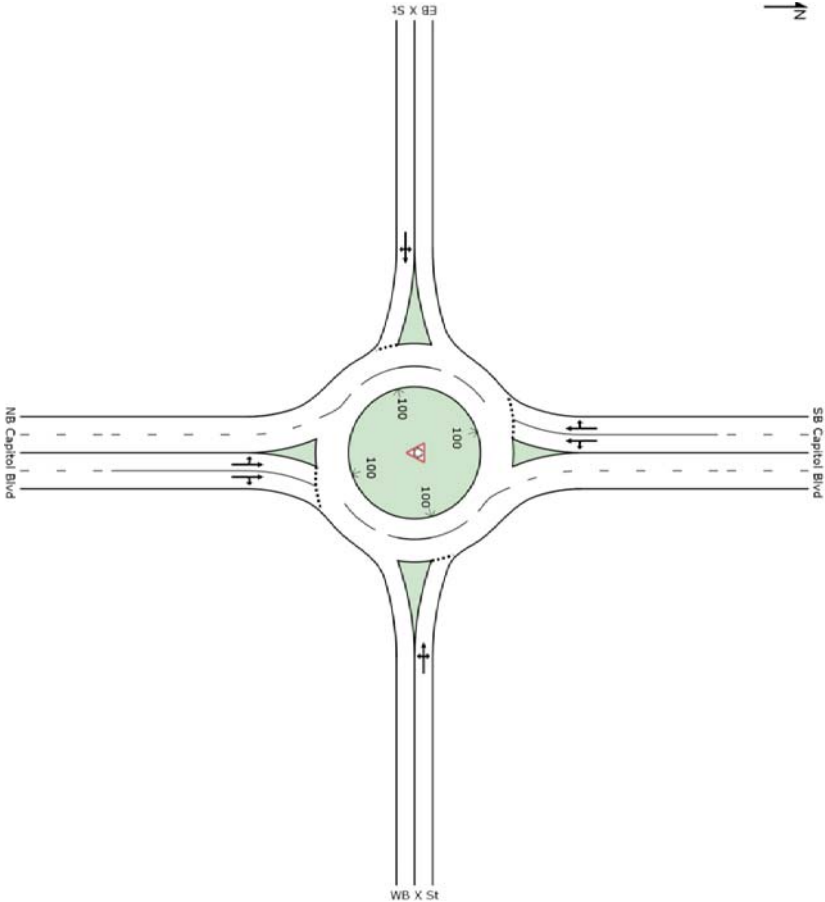
Movement Performance - Vehicles									
Mov	OD	Demand Flows	Deg.	Average	Level of	95% Back of Queue	Pop.	Effective	Average
ID	Mov	Total	HV %	Satn	Delay	Service	Vehicles	Stop Rate	Speed
		veh/h		v/c	sec		Distance	per veh	mph
South: NB Capitol Blvd									
3	L2	697	2.0	0.933	41.9	LOS D	15.0	380.4	1.00
8	T1	778	2.0	0.944	41.0	LOS D	16.7	424.4	1.00
18	R2	10	2.0	0.944	41.0	LOS D	16.7	424.4	1.00
Approach									
		1485	2.0	0.944	41.4	LOS D	16.7	424.4	1.00
East: WB Trosper Rd									
1	L2	51	2.0	0.208	19.7	LOS B	1.0	24.1	0.87
6	T1	253	2.0	0.805	43.2	LOS D	7.0	176.9	0.98
16	R2	51	2.0	0.805	43.2	LOS D	7.0	176.9	0.98
Approach									
		354	2.0	0.805	39.8	LOS D	7.0	176.9	0.96
North: SB Capitol Blvd									
7	L2	35	2.0	0.695	21.1	LOS C	5.9	149.7	0.93
4	T1	995	2.0	0.695	18.5	LOS B	6.7	170.6	0.94
14	R2	657	2.0	0.782	21.7	LOS C	8.7	221.1	0.99
Approach									
		1687	2.0	0.782	19.8	LOS B	8.7	221.1	0.96
West: EB Trosper Rd									
5	L2	601	2.0	0.516	11.1	LOS B	3.6	91.4	0.82
2	T1	66	2.0	0.516	11.2	LOS B	3.6	91.4	0.84
12	R2	465	2.0	0.533	11.4	LOS B	3.8	96.6	0.91
Approach									
		1131	2.0	0.533	11.2	LOS B	3.8	96.6	0.83
All Vehicles									
		4657	2.0	0.944	26.1	LOS C	16.7	424.4	0.94
									1.18
									22.5

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik MSD).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 38) X St at Capitol Blvd

Projected 2040 with Improvements
PM Peak Hour
Roundabout



MOVEMENT SUMMARY

Site: 38) X St at Capitol Blvd

Projected 2040 with Improvements
PM Peak Hour
Roundabout

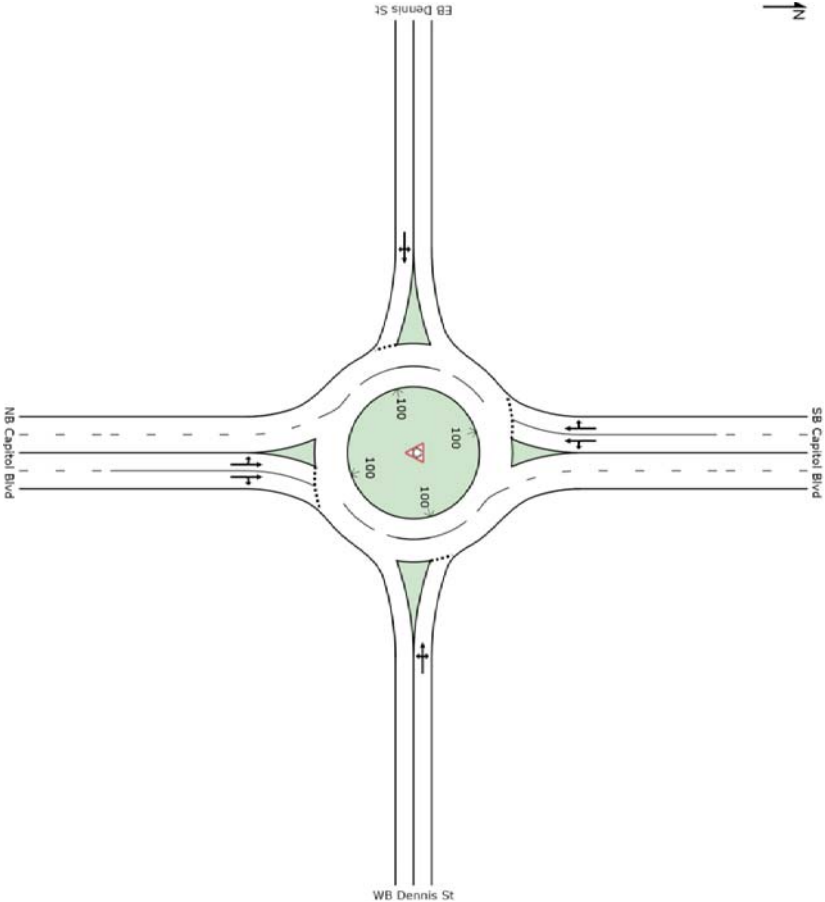
Movement Performance - Vehicles									
Mov	OD	Demand Flows	Deg. Satn	Average Delay	Level of Service	95% Back of Queue	Pop. Queued	Effective Stop Rate	Average Speed
ID	Mov	Total veh/n	HV %	sec		Vehicles Distance ft		per veh	mph
South: NB Capitol Blvd									
3	L2	26	2.0	0.481	7.7	LOS A	3.9	99.9	0.35
8	T1	1253	2.0	0.481	7.5	LOS A	4.0	100.5	0.34
18	R2	21	2.0	0.481	7.3	LOS A	4.0	100.5	0.33
Approach		1300	2.0	0.481	7.5	LOS A	4.0	100.5	0.34
East: WB X St									
1	L2	37	2.0	0.118	8.2	LOS A	0.5	11.5	0.66
6	T1	5	2.0	0.118	8.2	LOS A	0.5	11.5	0.66
16	R2	21	2.0	0.118	8.2	LOS A	0.5	11.5	0.66
Approach		63	2.0	0.118	8.2	LOS A	0.5	11.5	0.66
North: SB Capitol Blvd									
7	L2	37	2.0	0.495	7.9	LOS A	4.2	107.4	0.35
4	T1	1253	2.0	0.495	7.7	LOS A	4.3	108.1	0.34
14	R2	53	2.0	0.495	7.5	LOS A	4.3	108.1	0.33
Approach		1342	2.0	0.495	7.7	LOS A	4.3	108.1	0.34
West: EB X St									
5	L2	32	2.0	0.110	8.2	LOS A	0.4	10.8	0.66
2	T1	5	2.0	0.110	8.2	LOS A	0.4	10.8	0.66
12	R2	21	2.0	0.110	8.2	LOS A	0.4	10.8	0.66
Approach		58	2.0	0.110	8.2	LOS A	0.4	10.8	0.66
All Vehicles		2763	2.0	0.495	7.6	LOS A	4.3	108.1	0.35
									33.7

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik MSD).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 40) Dennis St at Capitol Blvd

Projected 2040 with Improvements
PM Peak Hour
Roundabout



MOVEMENT SUMMARY

Site: 40) Dennis St at Capitol Blvd

Projected 2040 with Improvements
PM Peak Hour
Roundabout

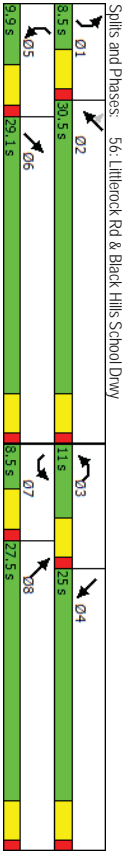
Movement Performance - Vehicles									
Mov	OD	Demand Flows	Deg	Average	Level of	95% Back of Queue	Pop.	Effective	Average
ID	Mov	Total H/V	Satn %	Delay sec	Service	Vehicles	Distance	Stop Rate	Speed
		veh/h				veh	ft	per veh	mph
South: NB Capitol Blvd									
3	L2	21	2.0	0.467	9.1	LOS A	3.5	89.4	0.68
8	T1	921	2.0	0.467	8.7	LOS A	3.6	92.6	0.67
18	R2	42	2.0	0.467	8.4	LOS A	3.6	92.6	0.67
Approach		984	2.0	0.467	8.7	LOS A	3.6	92.6	0.67
East WB Dennis St									
1	L2	42	2.0	0.293	11.5	LOS B	1.3	33.6	0.74
6	T1	26	2.0	0.293	11.5	LOS B	1.3	33.6	0.74
16	R2	79	2.0	0.293	11.5	LOS B	1.3	33.6	0.74
Approach		147	2.0	0.293	11.5	LOS B	1.3	33.6	0.74
North: SB Capitol Blvd									
7	L2	47	2.0	0.466	7.6	LOS A	3.9	98.8	0.39
4	T1	1053	2.0	0.466	7.4	LOS A	3.9	99.9	0.39
14	R2	132	2.0	0.466	7.2	LOS A	3.9	99.9	0.38
Approach		1232	2.0	0.466	7.4	LOS A	3.9	99.9	0.39
West EB Dennis St									
5	L2	237	2.0	0.562	17.1	LOS B	3.2	81.9	0.78
2	T1	42	2.0	0.562	17.1	LOS B	3.2	81.9	0.78
12	R2	37	2.0	0.562	17.1	LOS B	3.2	81.9	0.78
Approach		316	2.0	0.562	17.1	LOS B	3.2	81.9	0.78
All Vehicles		2679	2.0	0.562	9.3	LOS A	3.9	99.9	0.56

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik MSD).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Lanes, Volumes, Timings
56: Litterock Rd & Black Hills School Drwy
Projected 2040 with Imp
PM Peak Hour

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	MER	SWL	SWT	SWR
Lane Configurations	5	25	10	100	50	25	15	275	50	25	535	70
Traffic Volume (vph)	5	25	10	100	50	25	15	275	50	25	535	70
Future Volume (vph)	5	25	10	100	50	25	15	275	50	25	535	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	200	0	0	0	175	0	100	0	100	350	1
Storage Lanes	1	1	0	1	0	1	0	1	0	1	1	1
Taper Length (ft)	25			25				25			25	
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1065			515			1067			3970	
Travel Time (s)		24.2			11.7			24.3			90.2	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	2%	0%	2%	2%	1%	2%	2%	1%	2%	1%	1%
Shared Lane Traffic (%)												
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		1	6		5	2	2
Permitted Phases												
Detector Phase	7	4		3	8		1	6		5	2	2
Switch Phase												
Minimum Initial (s)	4.0	7.0		4.0	7.0		4.0	7.0		4.0	7.0	7.0
Minimum Spill (s)	8.5	24.5		8.5	27.5		8.5	24.5		8.5	27.5	27.5
Total Spill (s)	8.5	25.0		11.0	27.5		8.5	29.1		9.9	30.5	30.5
Total Split (%)	11.3%	33.3%		14.7%	36.7%		11.3%	38.8%		13.2%	40.7%	40.7%
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimizer?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Recall Mode	None	Max		None	None		None	Max		None	None	None

Intersection Summary		Other
Area Type:		
Cycle Length: 75		
Actuated Cycle Length: 67.1		
Natural Cycle: 75		
Control Type: Actuated-Uncoordinated		



HCM 2010 Signalized Intersection Summary

Projected 2040 with Imp
PM Peak Hour

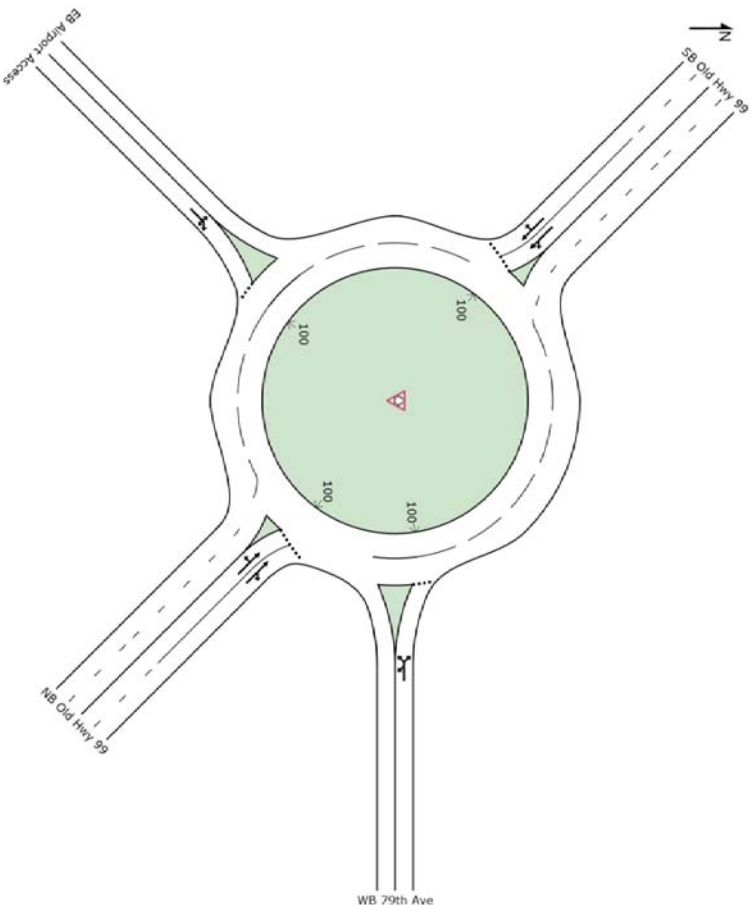
56: Litterock Rd & Black Hills School Drwy

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations	1	1	1	1	1	1	1	1	1	1	1	1
Traffic Volume (veh/h)	5	25	10	100	50	25	15	275	50	25	535	70
Future Volume (veh/h)	5	25	10	100	50	25	15	275	50	25	535	70
Number	7	4	14	3	8	18	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped Bike Adj(A _{pb})	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/hln	1900	1874	1900	1863	1863	1900	1881	1878	1900	1863	1881	1881
Adj Flow Rate, veh/h	5	26	11	105	53	26	16	289	53	26	563	74
Adj No of Lanes	1	1	1	1	1	1	1	1	1	1	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh. %	0	2	2	2	2	2	1	1	1	2	1	1
Cap. veh/h	97	366	155	134	372	182	27	543	100	40	675	574
Arrive On Green	0.05	0.29	0.29	0.08	0.31	0.31	0.02	0.35	0.35	0.02	0.36	0.36
Sat Flow, veh/h	1810	1251	529	1774	1181	579	1792	1545	283	1774	1881	1599
Grp Volume(V _g), veh/h	5	0	37	105	0	79	16	0	342	26	563	74
Grp Sat Flow(S _g), veh/hln	1810	0	1780	1774	0	1760	1792	0	1828	1774	1881	1599
Q Serve(S _g), s	0.2	0.0	1.1	4.1	0.0	2.3	0.6	0.0	10.4	1.0	19.2	2.2
Cycle Q Clear(Q _c), s	0.2	0.0	1.1	4.1	0.0	2.3	0.6	0.0	10.4	1.0	19.2	2.2
Prop In Lane	1.00	0.30	1.00	0.33	1.00	0.15	1.00	0.15	1.00	1.00	1.00	1.00
Lane Grp Cap(c), veh/h	97	0	522	134	0	554	27	0	643	40	675	574
W/C Ratio(X)	0.05	0.00	0.07	0.78	0.00	0.14	0.58	0.00	0.53	0.65	0.83	0.13
Avail Cap(c _a), veh/h	103	0	522	165	0	579	102	0	643	137	699	594
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(f)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay(d), s/veh	31.4	0.0	17.9	31.8	0.0	17.2	34.2	0.0	18.1	33.9	20.5	15.1
Incr Delay(d ₂), s/veh	0.2	0.0	0.3	17.7	0.0	0.1	7.1	0.0	3.1	16.0	8.5	0.1
Initial Q Delay(d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackQ(50%), veh/h	0.1	0.0	0.6	2.6	0.0	1.1	0.4	0.0	5.8	0.7	11.5	1.0
LnGrp Delay(d), s/veh	31.6	0.0	18.1	49.5	0.0	17.3	41.4	0.0	21.2	50.0	29.1	15.2
LnGrp LOS	C		B	D		B	D		C	D	C	B
Approach Vol, veh/h	42			184				358		663		
Approach Delay, s/veh	19.7			35.7				22.1		28.3		
Approach LOS	B			D				C		C		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+R ₀), s	5.6	29.6	9.8	25.0	6.1	29.1	8.3	26.5				
Change Period (Y+R ₀), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (G _{max}), s	4.0	26.0	6.5	20.5	5.4	24.6	4.0	23.0				
Max Q Clear Time (Q _c +t ₁), s	2.6	21.2	3.1	3.0	12.4	2.2	4.3	4.3				
Green Ext Time (p _c), s	0.0	2.8	0.0	0.6	0.0	5.6	0.0	0.6				
Intersection Summary												
HCM 2010 Ctrl Delay												
HCM 2010 LOS												

SITE LAYOUT

Site: 59) 79th Ave at Old Hwy 99

Projected 2040 with Improvements
PM Peak Hour
Roundabout



MOVEMENT SUMMARY

Site: 59) 79th Ave at Old Hwy 99

Projected 2040 with Improvements

PM Peak Hour

Roundabout

Movement Performance - Vehicles										
Mov	OD	Demand Flows	Deg. Satn	Average Delay	Level of Service	95% Back of Queue	Pop. Queued	Effective Stop Rate	Average Speed	
ID	Mov	Total veh/h	H/V %	sec		Vehicles	Distance	per veh	mph	
SouthEast: NB Old Hwy 99										
3x	L2	1	1.0	0.272	5.4	LOS A	1.7	41.8	0.36	0.21
8x	T1	679	1.0	0.272	5.2	LOS A	1.7	42.3	0.36	0.20
18x	R3	21	1.0	0.272	5.0	LOS A	1.7	42.3	0.35	0.19
Approach		701	1.0	0.272	5.2	LOS A	1.7	42.3	0.36	0.20
East WB 79th Ave										
1b	L3	32	1.0	0.224	7.5	LOS A	0.9	23.0	0.57	0.56
1a	L1	1	1.0	0.224	7.5	LOS A	0.9	23.0	0.57	0.56
16a	R1	132	1.0	0.224	7.5	LOS A	0.9	23.0	0.57	0.56
Approach		164	1.0	0.224	7.5	LOS A	0.9	23.0	0.57	0.56
NorthWest: SB Old Hwy 99										
7ax	L1	137	1.0	0.588	9.3	LOS A	6.4	160.8	0.29	0.10
4x	T1	126	1.0	0.588	9.0	LOS A	6.4	161.3	0.28	0.10
14x	R2	1	1.0	0.588	8.9	LOS A	6.4	161.3	0.28	0.10
Approach		164	1.0	0.588	9.1	LOS A	6.4	161.3	0.28	0.10
SouthWest: EB Airport Access										
5x	L2	1	2.0	0.027	8.1	LOS A	0.1	2.6	0.69	0.65
12ax	R1	1	2.0	0.027	8.1	LOS A	0.1	2.6	0.69	0.65
12x	R2	11	2.0	0.027	8.1	LOS A	0.1	2.6	0.69	0.65
Approach		13	2.0	0.027	8.1	LOS A	0.1	2.6	0.69	0.65
All Vehicles		2542	1.0	0.588	7.9	LOS A	6.4	161.3	0.32	0.16

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement. LOS F will result if v/c > 1.1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements v/c not used as specified in HCM 2010).

Roundabout Capacity Model: SIDRA Standard.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik MSD).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Organisation: SCJ ALLIANCE | Processed: Wednesday, February 17, 2016 3:14:11 PM

Project: N:\Projects\0625_City of Turmwater\0625_17_Turmwater Transportation Master Plan\TrafficOperations\sidra\2040 With Imp\59) 79th Ave at Old Hwy 99.sp6

Lanes, Volumes, Timings

63: I-5 SB Ramps & 93rd Ave

Projected 2040 with Imp

PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	415	95	85	305	0	0	0	0	475	0	425
Future Volume (vph)	0	415	95	85	305	0	0	0	0	475	0	425
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	150	0	150	0	0	0	0	0	300	1
Storage Lanes	0	0	1	0	1	0	0	0	0	0	1	1
Taper Length (ft)	25		25		25		25		25		25	
Right Turn on Red			Yes			Yes		Yes		Yes		Yes
Link Speed (mph)		30			40		30		30		30	
Link Distance (ft)		732			936		1099		1099		1644	
Travel Time (s)		16.6			16.0		25.0		25.0		37.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	1%	1%	9%	9%	9%	0%	0%	0%	4%	4%	4%
Shared Lane Traffic (%)												
Turn Type	NA			pm+pt	NA					Perm	NA	Perm
Protected Phases	4			3	8					6		6
Permitted Phases				8								6
Detector Phase	4			3	8					6		6
Switch Phase												
Minimum Initial (s)	4.0			4.0	4.0					4.0		4.0
Minimum Spill (s)	200			8.0	20.0					20.0		20.0
Total Spill (s)	2.00			9.0	29.0					31.0		31.0
Total Split (%)	33.3%			15.0%	48.3%					51.7%		51.7%
Yellow Time (s)	3.5			3.5	3.5					3.5		3.5
All-Red Time (s)	0.5			0.5	0.5					0.5		0.5
Lost Time Adjust (s)	0.0			0.0	0.0					0.0		0.0
Total Lost Time (s)	4.0			4.0	4.0					4.0		4.0
Lead/Lag			Lag		Lead							
Lead-Lag Optimize?	Yes			Yes								
Recall Mode	None			None	None					Max	Max	Max
Intersection Summary												
Area Type:	Other											
Cycle Length: 60												
Actuated Cycle Length: 55.5												
Natural Cycle: 55												
Control Type: Actuated-Uncoordinated												
Spills and Phases: 63: I-5 SB Ramps & 93rd Ave												

HCM 2010 Signalized Intersection Summary 63: I-5 SB Ramps & 93rd Ave

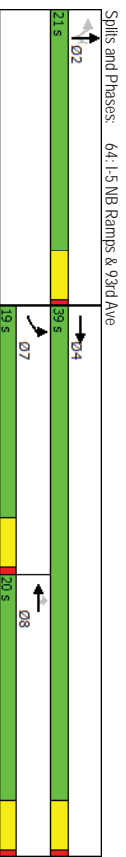
Projected 2040 with Imp
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (veh/h)	0	415	95	85	305	0	0	0	475	0	425	425
Future Volume (veh/h)	0	415	95	85	305	0	0	0	475	0	425	425
Number	7	4	14	3	8	18	1	6	16	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped Bike Adj(A_pb7)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/hln	1881	1900	1743	1743	0	1900	1827	1827	1827	0	268	268
Adj Flow Rate, veh/h	0	437	100	89	321	0	500	0	500	0	268	268
Adj No of Lanes	0	2	0	1	2	0	1	0	1	0	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh. %	0	1	1	9	9	0	4	4	4	4	4	4
Cap. veh/h	0	657	149	296	1180	0	864	0	864	0	771	771
Arrive On Green	0.00	0.23	0.23	0.06	0.36	0.00	0.50	0.00	0.50	0.00	0.50	0.50
Sat Flow, veh/h	0	2989	657	1660	3399	0	1740	0	1553	0	1553	1553
Grp Volume(V), veh/h	0	268	269	89	321	0	500	0	268	0	268	268
Grp Sat Flow(s), veh/hln	0	1787	1765	1660	1656	0	1740	0	1553	0	1553	1553
Q Serve(g), s	0.0	7.4	7.5	2.1	3.8	0.0	11.0	0.0	5.7	0.0	5.7	5.7
Cycle Q Clear(g,c), s	0.0	7.4	7.5	2.1	3.8	0.0	11.0	0.0	5.7	0.0	5.7	5.7
Prop In Lane	0.00	0.37	1.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00	1.00
Lane Grp Cap(c), veh/h	0	405	400	296	1180	0	864	0	771	0	771	771
W/C Ratio(X)	0.00	0.66	0.67	0.30	0.27	0.00	0.58	0.00	0.35	0.00	0.35	0.35
Avail Cap(c), veh/h	0	526	519	356	1523	0	864	0	771	0	771	771
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(f)	0.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	19.1	19.2	14.2	12.5	0.0	9.7	0.0	8.3	0.0	8.3	8.3
Incr Delay (d2), s/veh	0.0	2.0	2.2	0.6	0.1	0.0	2.8	0.0	1.2	0.0	1.2	1.2
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOf(50%), veh/h	0.0	3.9	3.9	1.0	1.7	0.0	6.0	0.0	2.6	0.0	2.6	2.6
LnGrp Delay(d), s/veh	0.0	21.1	21.4	14.8	12.6	0.0	12.5	0.0	9.6	0.0	9.6	9.6
LnGrp LOS	C	C	C	B	B		B		A		A	A
Approach Vol, veh/h	537			410			768					
Approach Delay, s/veh	21.2			13.1			11.5					
Approach LOS	C			B			B					
Timer	1	2	3	4	5	6	7	8				
Assigned Phs												
Phs Duration (G+Y+Rd), s	7.0	16.3		31.0		23.4						
Change Period (Y+Rd), s	4.0	4.0		4.0		4.0						
Max Green Setting (Gmax), s	5.0	16.0		27.0		25.0						
Max Q Clear Time (Q_c+1), s	4.1	9.5		13.0		5.8						
Green Ext Time (Q_c), s	0.0	2.8		3.7		5.2						
Intersection Summary												
HCM 2010 Crt Delay	14.9											
HCM 2010 LOS	B											

Lanes, Volumes, Timings 64: I-5 NB Ramps & 93rd Ave

Projected 2040 with Imp
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	290	555	0	0	290	425	130	0	155	0	0	0
Future Volume (vph)	290	555	0	0	290	425	130	0	155	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	125	0	0	0	300	0	200	0	0	0	0	0
Storage Lanes	1	1	0	0	1	0	1	0	1	0	0	0
Taper Length (ft)	25			25			25			25		
Right Turn on Red				Yes		Yes		Yes		Yes		Yes
Link Speed (mph)		40			40		30		30		30	
Link Distance (ft)		936			1635		1212		341		341	
Travel Time (s)		16.0			27.9		27.5		7.8		7.8	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	3%	3%	3%	8%	8%	8%	14%	14%	14%	14%	0%	0%
Shared Lane Traffic (%)												
Turn Type	Prot	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	7	4			8	8	2	2	2			
Permitted Phases	7	4			8	8	2	2	2			
Detector Phase	7	4			8	8	2	2	2			
Switch Phase												
Minimum Initial (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Minimum Spill (s)	8.0	20.0			20.0	20.0	20.0	20.0	20.0			
Total Spill (s)	19.0	39.0			20.0	20.0	21.0	21.0	21.0			
Total Split (%)	31.7%	65.0%			33.3%	33.3%	35.0%	35.0%	35.0%			
Yellow Time (s)	3.5	3.5			3.5	3.5	3.5	3.5	3.5			
All-Red Time (s)	0.5	0.5			0.5	0.5	0.5	0.5	0.5			
Lost Time Adjust (s)	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Total Lost Time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lead/Lag	Lead	Lead			Lag	Lag						
Lead/Lag Optimizer?	Yes	Yes			Yes	Yes						
Recall Mode	None	None			None	None	Min	Min	Min			
Intersection Summary												
Area Type:	Other											
Cycle Length: 60												
Actuated Cycle Length: 45.7												
Natural Cycle: 60												
Control Type: Actuated-Uncoordinated												



HCM 2010 Signalized Intersection Summary

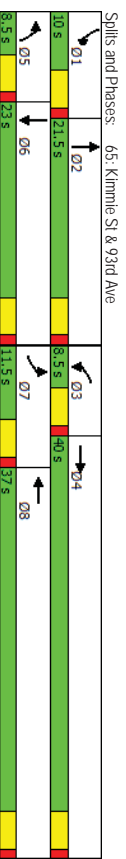
Projected 2040 with Imp
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (veh/h)	290	555	0	0	290	425	130	0	155	0	0	0
Future Volume (veh/h)	290	555	0	0	290	425	130	0	155	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Q ₀), veh	0	0	0	0	0	0	0	0	0			
Ped Bike Adj(A _{pb})	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/hln	1845	1845	0	0	1759	1759	1900	1667	1667			
Adj Flow Rate, veh/h	305	584	0	0	305	0	137	0	1			
Adj No of Lanes	1	2	0	0	2	1	0	1	1			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh. %	3	3	0	0	8	8	14	14	14			
Cap. veh/h	395	2124	0	0	875	391	246	0	219			
Arrive On Green	0.22	0.61	0.00	0.00	0.26	0.00	0.15	0.00	0.00			
Sat Flow, veh/h	1757	3597	0	0	3431	1495	1587	0	1417			
Grp Volume(V _g), veh/h	305	584	0	0	305	0	137	0	0			
Grp Sat Flow(S _g), veh/hln	1757	1752	0	0	1671	1495	1587	0	1417			
Q Serve(g _s), s	5.5	2.6	0.0	0.0	2.5	0.0	2.7	0.0	0.0			
Cycle Q Clear(g _c), s	5.5	2.6	0.0	0.0	2.5	0.0	2.7	0.0	0.0			
Prop In Lane	1.00	0.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Lane Grp Cap(c _g), veh/h	395	2124	0	0	875	391	246	0	219			
W/C Ratio(X)	0.77	0.27	0.00	0.00	0.35	0.00	0.56	0.00	0.00			
Avail Cap(c _a), veh/h	787	3665	0	0	1598	715	806	0	719			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(f)	1.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00			
Uniform Delay (d _u), s/veh	12.2	3.1	0.0	0.0	10.0	0.0	13.1	0.0	0.0			
Incr Delay (d ₂), s/veh	3.2	0.1	0.0	0.0	0.2	0.0	2.0	0.0	0.0			
Initial Q Delay(d ₀), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackQ(50%), veh/h	3.0	1.2	0.0	0.0	1.2	0.0	1.3	0.0	0.0			
LnGrp Delay(d ₀), s/veh	15.4	3.2	0.0	0.0	10.3	0.0	15.1	0.0	0.0			
LnGrp LOS	B	A			B		B					
Approach Vol, veh/h	889				305				137			
Approach Delay, s/veh	7.4				10.3				15.1			
Approach LOS	A				B				B			
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	2	2	4	7	7	8						
Phs Duration (G+Y+R ₀), s	9.2	24.3	11.5	12.8								
Change Period (Y+R ₀), s	4.0	4.0	4.0	4.0								
Max Green Setting (G _{max}), s	17.0	35.0	15.0	16.0								
Max Q Clear Time (Q _{ch1}), s	4.7	4.6	7.5	4.5								
Green Ext Time (Q _{ch1}), s	0.5	6.3	0.5	4.3								
Intersection Summary												
HCM 2010 Crt Delay	8.8											
HCM 2010 LOS	A											

Lanes, Volumes, Timings

Projected 2040 with Imp
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	55	535	5	5	475	15	15	1	10	30	15	110
Future Volume (vph)	55	535	5	5	475	15	15	1	10	30	15	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	100	0	100	250	100	0	100	0	100	0	0
Storage Lanes	1	1	0	1	1	1	1	1	0	1	1	0
Taper Length (ft)	25			25			25			25		
Right Turn on Red		Yes			Yes		Yes		Yes		Yes	
Link Speed (mph)	40			40			40		30		30	
Link Distance (ft)	1635			3676			62.7		860		5320	
Travel Time (s)	21.9			21.9			62.7		19.5		120.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	4%	4%	4%	1%	1%	1%	0%	0%	0%	5%	5%	5%
Shared Lane Traffic (%)	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Turn Type	7	4		3	8		5	2		1	6	
Permitted Phases	7	4		3	8		5	2		1	6	
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Spill (s)	8.5	20.5		8.5	20.5		8.5	20.5		8.5	20.5	
Total Split (s)	11.5	40.0		8.5	37.0		8.5	21.5		10.0	23.0	
Total Split (%)	14.4%	50.0%		10.6%	46.3%		10.6%	26.9%		12.5%	28.8%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimizer?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Min		None	Min	
Intersection Summary												
Area Type:	Other											
Cycle Length:	80											
Actuated Cycle Length:	40.5											
Natural Cycle:	65											
Control Type:	Actuated-Uncoordinated											



HCM 2010 Signalized Intersection Summary
65: Kimmie St & 93rd Ave

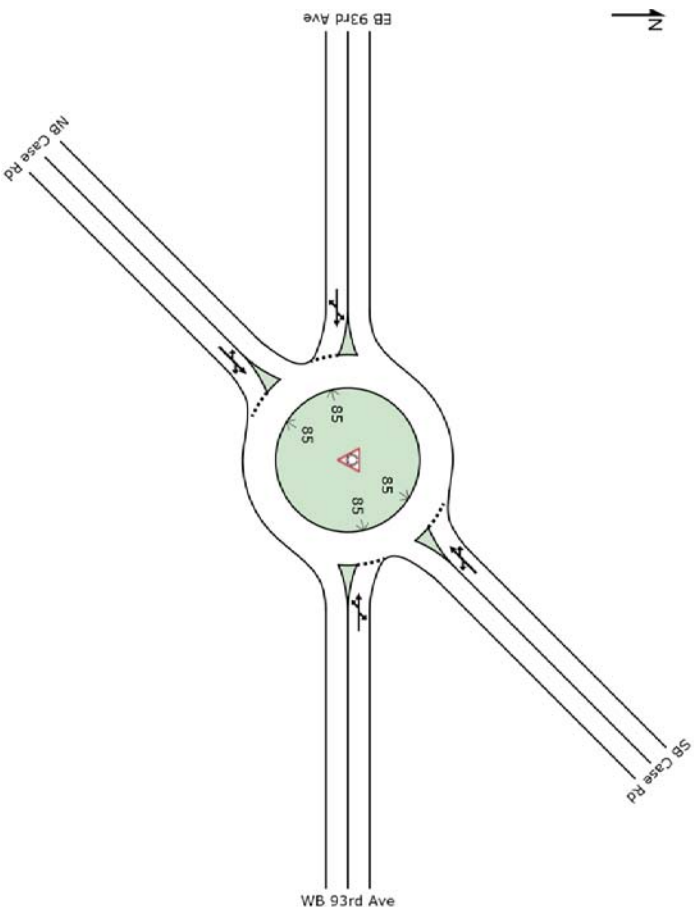
Projected 2040 with Imp
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	1	1	5	1	1	1	1	1	1	1	1	1
Traffic Volume (veh/h)	55	535	5	5	475	15	15	1	10	30	15	110
Future Volume (veh/h)	55	535	5	5	475	15	15	1	10	30	15	110
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped Bike Adj(A_pb7)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/hln	1827	1827	1900	1881	1881	1900	1900	1900	1810	1810	1900	1900
Adj Flow Rate, veh/h	58	563	5	5	500	16	16	1	11	32	16	116
Adj No of Lanes	1	1	0	1	2	0	1	0	1	1	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh. %	4	4	4	1	1	1	0	0	5	5	5	5
Cap. veh/h	80	803	7	10	1428	46	29	17	185	50	26	188
Arrive On Green	0.05	0.44	0.44	0.01	0.40	0.40	0.02	0.12	0.12	0.03	0.14	0.14
Sat Flow, veh/h	1740	1808	16	1792	3535	113	1810	136	1499	1723	190	1377
Grip Volume(V), veh/h	58	0	568	5	252	264	16	0	12	32	0	132
Grip Sat Flow(s), veh/hln	1740	0	1824	1792	1787	1861	1810	0	1635	1723	0	1567
Q Serve(g.s), s	1.5	0.0	11.4	0.1	4.4	4.5	0.4	0.0	0.3	0.8	0.0	3.6
Cycle Q Clear(g.c), s	1.5	0.0	11.4	0.1	4.4	4.5	0.4	0.0	0.3	0.8	0.0	3.6
Prop In Lane	1.00	0.01	1.00	0.06	1.00	0.92	1.00	0.92	1.00	0.88	0.88	0.88
Lane Grp Cap(c), veh/h	80	0	810	10	722	752	29	0	202	50	0	214
W/C Ratio(X)	0.73	0.00	0.70	0.52	0.35	0.35	0.55	0.00	0.06	0.63	0.00	0.62
Avail Cap(c, a), veh/h	269	0	1430	158	1283	1336	160	0	614	209	0	640
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(f)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	21.3	0.0	10.2	22.5	9.4	9.4	22.1	0.0	17.5	21.7	0.0	18.4
Incr Delay (d2), s/veh	11.9	0.0	1.1	37.0	0.3	0.3	15.1	0.0	0.1	12.4	0.0	2.9
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOf(50%), veh/h	1.0	0.0	5.9	0.2	2.2	2.3	0.3	0.0	0.1	0.6	0.0	1.7
LnGrp Delay(d), s/veh	33.3	0.0	11.3	59.5	9.7	9.7	37.2	0.0	17.6	34.2	0.0	21.3
LnGrp LOS	C	C	B	E	A	A	D	C	B	C	C	C
Approach Vol, veh/h	626			521			28			164		
Approach Delay, s/veh	13.3			10.1			28.8			23.8		
Approach LOS	B			B			C			C		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+R), s	5.8	10.1	4.7	24.6	5.2	10.7	6.6	22.8				
Change Period (Y+R), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.5	17.0	4.0	35.5	4.0	18.5	7.0	32.5				
Max Q Clear Time (Q_c+I1), s	2.8	2.3	2.1	13.4	2.4	5.6	3.5	6.5				
Green Ext Time (Q_c), s	0.0	0.6	0.0	6.7	0.0	0.6	0.0	7.1				
Intersection Summary												
HCM 2010 Crt Delay	13.7											
HCM 2010 LOS	B											

SITE LAYOUT

Site: 66) Case Rd at 93rd Ave

Projected 2040 With Improvements
PM Peak Hour
Roundabout



MOVEMENT SUMMARY

Site: 66) Case Rd at 93rd Ave

Projected 2040 With Improvements
PM Peak Hour
Roundabout

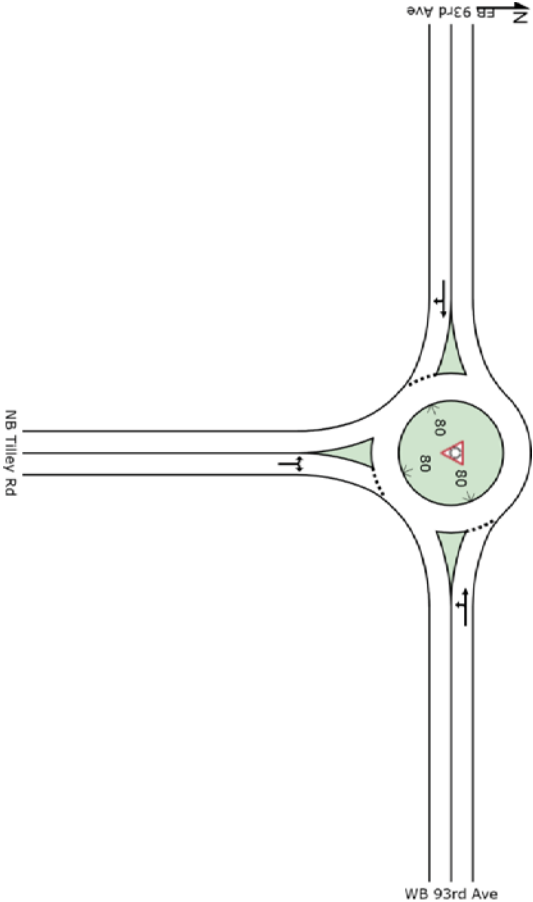
Movement Performance - Vehicles											
Mov	OD	Demand Flows	Deg.	Average	Level of	95% Back of Queue	Pop.	Effective	Average		
ID	Mov	Total	HV %	Satn	Delay	Service	Vehicles	Distance	Queued	Stop Rate	Speed
		veh/h	%	v/c	sec		veh	ft		per veh	mph
East WB 93rd Ave											
1a	L1	253	2.0	0.659	13.0	LOS B	7.1	179.9	0.66	0.42	30.1
6	T1	379	2.0	0.659	13.0	LOS B	7.1	179.9	0.66	0.42	30.4
16b	R3	68	2.0	0.659	13.0	LOS B	7.1	179.9	0.66	0.42	29.4
Approach											
		700	2.0	0.659	13.0	LOS B	7.1	179.9	0.66	0.42	30.2
NorthEast: SB Case Rd											
1bx	L3	147	2.0	0.407	12.4	LOS B	2.9	72.4	0.85	0.85	30.0
6x	T1	84	2.0	0.407	12.4	LOS B	2.9	72.4	0.85	0.85	29.8
16ax	R1	5	2.0	0.407	12.4	LOS B	2.9	72.4	0.85	0.85	29.6
Approach											
		237	2.0	0.407	12.4	LOS B	2.9	72.4	0.85	0.85	29.9
West: EB 93rd Ave											
5a	L1	5	2.0	0.789	23.7	LOS C	11.1	282.6	0.98	1.14	26.7
2	T1	458	2.0	0.789	23.7	LOS C	11.1	282.6	0.98	1.14	27.0
12b	R3	147	2.0	0.789	23.7	LOS C	11.1	282.6	0.98	1.14	26.2
Approach											
		611	2.0	0.789	23.7	LOS C	11.1	282.6	0.98	1.14	26.8
SouthWest: NB Case Rd											
5bx	L3	89	2.0	0.280	9.2	LOS A	1.8	45.8	0.78	0.71	31.6
2x	T1	37	2.0	0.280	9.2	LOS A	1.8	45.8	0.78	0.71	31.4
12ax	R1	53	2.0	0.280	9.2	LOS A	1.8	45.8	0.78	0.71	31.2
Approach											
		179	2.0	0.280	9.2	LOS A	1.8	45.8	0.78	0.71	31.4
All Vehicles											
		1726	2.0	0.789	16.3	LOS B	11.1	282.6	0.81	0.76	29.0

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik MSD).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 67) 93rd Ave at Tilley Rd (South)

Projected 2040 with Improvements
Roundabout



MOVEMENT SUMMARY

Site: 67) 93rd Ave at Tilley Rd (South)

Projected 2040 with Improvements
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: NB Tilley Rd											
3	L2	179	2.0	0.345	8.8	LOS A	2.3	58.9	0.71	0.60	31.2
18	R2	89	2.0	0.345	8.8	LOS A	2.3	58.9	0.71	0.60	30.5
Approach		268	2.0	0.345	8.8	LOS A	2.3	58.9	0.71	0.60	31.0
East: WB 93rd Ave											
1	L2	279	2.0	0.788	19.4	LOS B	12.0	305.6	0.89	0.70	27.8
6	T1	511	2.0	0.788	19.4	LOS B	12.0	305.6	0.89	0.70	27.8
Approach		789	2.0	0.788	19.4	LOS B	12.0	305.6	0.89	0.70	27.8
West: EB 93rd Ave											
2	T1	405	2.0	0.732	17.9	LOS B	9.5	241.7	0.90	0.82	28.9
12	R2	247	2.0	0.732	17.9	LOS B	9.5	241.7	0.90	0.82	28.3
Approach		653	2.0	0.732	17.9	LOS B	9.5	241.7	0.90	0.82	28.7
All Vehicles		1711	2.0	0.788	17.2	LOS B	12.0	305.6	0.86	0.73	28.6

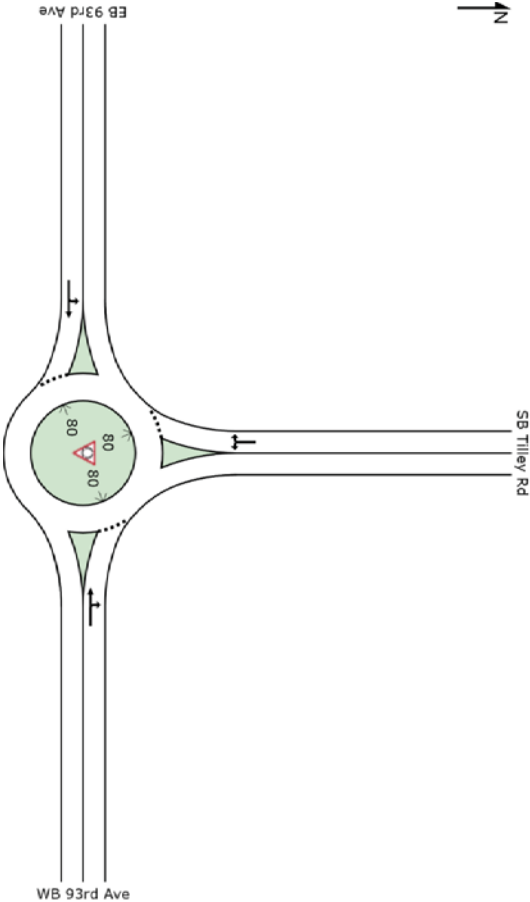
Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: SIDRA Standard (Alcalki MSD).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: N:\Projects\0625 City of Tumwater\0625_17 Tumwater Transportation Master Plan\TrafficOperations\sldra2040 With Imp\67 93rd Ave at Tilley Rd (South).sfp6

SITE LAYOUT

Site: 68) 93rd Ave at Tilley Rd (North)

Projected 2040 with Improvements
Roundabout



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Project: N:\Projects\0625 City of Tumwater\0625_17 Tumwater Transportation Master Plan\TrafficOperations\sldra2040 With Imp\68 93rd Ave at Tilley Rd (North).sfp6

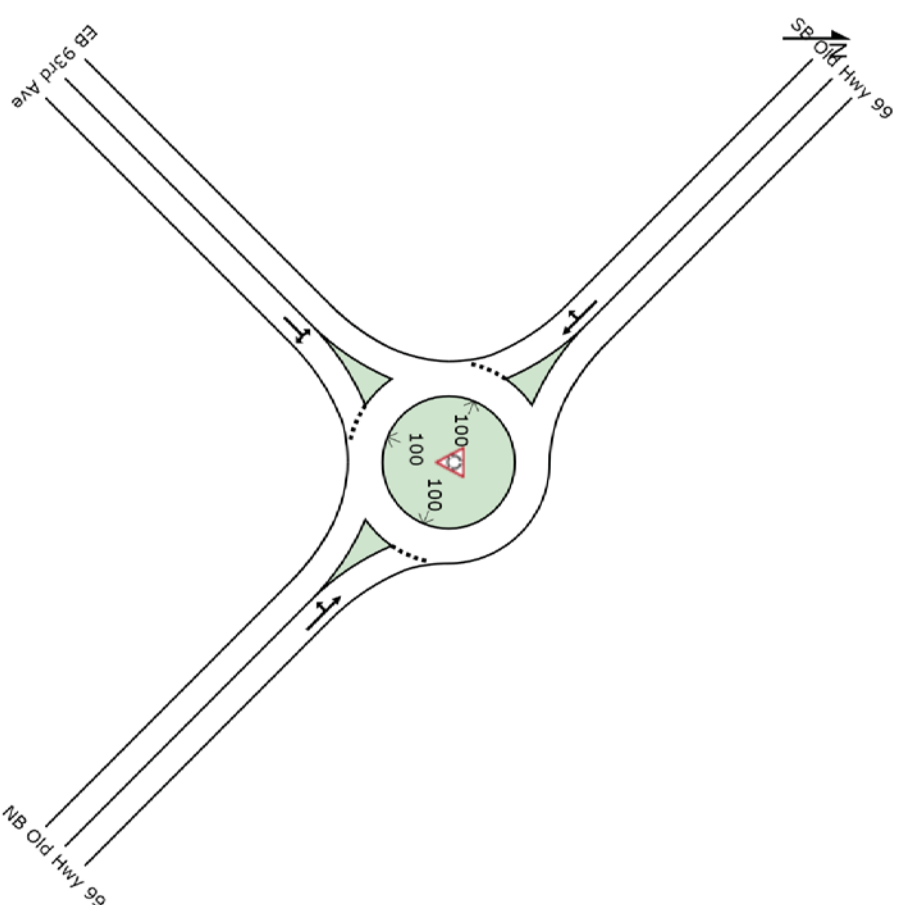
Site: 68) 93rd Ave at Tilley Rd (North)

Projected 20
Roundabout

Level of Service (LOS). Method: Delay < v/c (HCM 2010). Roundabout LOS Method: Same as Signalized Intersections. Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement. LOS F will result if $v/c > 1$. Irrespective of movement delay value (does not apply for approaches and intersection). Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010). Roundabout Capacity Model: SIDRA Standard. HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies. Gap-Acceptance Capacity: SIDRA Standard (Akcelik M30). HV% values are calculated for All Movement Classes of All heavy Vehicle Model Designation.

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 Organisation: SCJ ALLIANCE | Priced: Thursday, February 25, 2016 12:42:02 PM
 Project: N:\Projects\0625 City of Turnwater\0625.17 Turnwater Transportation Master Plan\Traffic Operations\sidra\2040 With Imp\68 93rd Ave at, Tiley Rd
 (North).snp6

Site: 69) 93rd Ave at Old Hwy 99

PM Peak Hour
Roundabout

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 Organisation: SCJ ALLIANCE | Created: Thursday, February 25, 2016 11:31:20 AM
 Project: N:\Projects\0625 City of Turnwater\0625_17 Turnwater Transportation Master Plan\Traffic\Operations\sidra\2040 With Imp69\93rd Ave at Old Hwy
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MOVEMENT SUMMARY

Site: 69) 93rd Ave at Old Hwy 99

Projected 2040 With Improvements
PM Peak Hour
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg Satn w/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
Southeast: NB Old Hwy 99											
3x	L2	200	2.0	0.447	7.4	LOSA	4.3	109.6	0.18	0.05	33.1
8x	T1	358	2.0	0.447	7.4	LOSA	4.3	109.6	0.18	0.05	33.0
Approach		558	2.0	0.447	7.4	LOSA	4.3	109.6	0.18	0.05	33.0
NorthWest: SB Old Hwy 99											
4x	T1	937	2.0	0.922	32.1	LOSC	24.0	608.9	1.00	0.96	24.8
14x	R2	32	2.0	0.922	32.1	LOSC	24.0	608.9	1.00	0.96	24.3
Approach		968	2.0	0.922	32.1	LOSC	24.0	608.9	1.00	0.96	24.8
SouthWest: EB 93rd Ave											
5x	L2	16	2.0	0.623	27.5	LOSC	5.9	150.0	1.00	1.13	25.8
12x	R2	216	2.0	0.623	27.5	LOSC	5.9	150.0	1.00	1.13	25.2
Approach		232	2.0	0.623	27.5	LOSC	5.9	150.0	1.00	1.13	25.3
All Vehicles		1758	2.0	0.922	23.7	LOSC	24.0	608.9	0.74	0.69	27.0

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik MSD).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

HCM 2010 AWSC
1: RW Johnson Rd & Mottman Rd

Projected 2022 without improvements
PM Peak Hour

Intersection														
Intersection Delay, s/veh		12.6												
Intersection LOS		B												
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR		
Traffic Vol, veh/h	0	45	85	5	0	120	45	85	0	5	175	135		
Future Vol, veh/h	0	45	85	5	0	120	45	85	0	5	175	135		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92		
Heavy Vehicles, %	2	6	6	6	2	9	9	9	2	4	4	4		
Mvmt Flow	0	49	92	5	0	130	49	92	0	5	190	147		
Number of Lanes	0	1	1	0	0	1	1	0	0	1	1	0		
Approach	EB				WB				NB					
Opposing Approach	WB				EB				SB					
Opposing Lanes	2				2				2					
Conflicting Approach Left	SB				NB				EB					
Conflicting Lanes Left	2				2				2					
Conflicting Approach Right	NB				SB				WB					
Conflicting Lanes Right	2				2				2					
HCM Control Delay	10.8				11.4				15.4					
HCM LOS	B				B				C					
Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2						
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%						
Vol Thru, %	0%	56%	0%	94%	0%	35%	0%	85%						
Vol Right, %	0%	44%	0%	6%	0%	65%	0%	15%						
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop						
Traffic Vol by Lane	5	310	45	90	120	130	45	130						
LT Vol	5	0	45	0	120	0	45	0						
Through Vol	0	175	0	85	0	45	0	110						
RT Vol	0	135	0	5	0	85	0	20						
Lane Flow Rate	5	337	49	98	130	141	49	141						
Geometry Grp	7	7	7	7	7	7	7	7						
Degree of Util (X)	0.01	0.548	0.098	0.18	0.254	0.237	0.094	0.246						
Departure Headway (Hd)	6.676	5.86	7.177	6.629	7.009	6.036	6.884	6.267						
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes						
Cap	535	613	498	539	511	593	519	571						
Service Time	4.43	3.614	4.943	4.394	4.766	3.794	4.647	4.029						
HCM Lane v/c Ratio	0.009	0.55	0.098	0.182	0.254	0.238	0.094	0.247						
HCM Control Delay	9.5	15.5	10.7	10.9	12.2	10.7	10.4	11.1						
HCM Lane LOS	A	C	B	B	B	B	B	B						
HCM 95th-ile Q	0	3.3	0.3	0.7	1	0.9	0.3	1						

HCM 2010 AWSC 1: RW Johnson Rd & Mottman Rd

Projected 2022 without improvements
PM Peak Hour

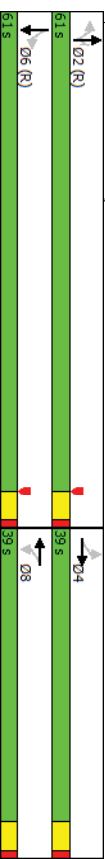
Intersection					
Intersection Delay, s/veh					
Intersection LOS					
Movement	SBU	SBL	SBT	SBR	
Traffic Vol, veh/h	0	45	110	20	
Future Vol, veh/h	0	45	110	20	
Peak Hour Factor	0.92	0.92	0.92	0.92	
Heavy Vehicles, %	2	3	3	3	
Wmnt Flow	0	49	120	22	
Number of Lanes	0	1	1	0	
Approach	SB				
Opposing Approach	NB				
Opposing Lanes	2				
Conflicting Approach Left	WB				
Conflicting Lanes Left	2				
Conflicting Approach Right	EB				
Conflicting Lanes Right	2				
HCM Control Delay	10.9				
HCM LOS	B				
ane					

Lanes, Volumes, Timings 2: Crosby Blvd & Mottman Rd

Projected 2022 without improvements
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	180	250	25	5	30	85	45	425	155	135	690	455
Future Volume (vph)	180	250	25	5	30	85	45	425	155	135	690	455
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200	0	0	0	0	200	0	100	0	100	0	0
Storage Lanes	1	1	0	0	0	1	1	1	1	1	1	0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes		Yes		Yes		Yes		Yes	
Link Speed (mph)		30			30		30		30		30	
Link Distance (ft)		940			1116		645		645		417	
Travel Time (s)		21.4			25.4		14.7		14.7		9.5	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	3%	3%	3%	0%	0%	0%	1%	1%	1%	3%	3%	3%
Shared Lane Traffic (%)												
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	NA	Perm	NA
Protected Phases		4			8			2		2		6
Permitted Phases	4			8			2		2		6	
Detector Phase	4	4		8	8		2	2	2	2	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Minimum Spill (s)	20.5	20.5		20.5	20.5		20.5	20.5	20.5	20.5	20.5	20.5
Total Spill (s)	39.0	39.0		39.0	39.0		61.0	61.0	61.0	61.0	61.0	61.0
Total Split (%)	39.0%	39.0%		39.0%	39.0%		61.0%	61.0%	61.0%	61.0%	61.0%	61.0%
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5
LeadLag												
LeadLag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max	C-Max	C-Max	C-Max	

Intersection Summary												
Area Type: Other												
Cycle Length: 100												
Actuated Cycle Length: 100												
Offset: 82. (82%). Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow												
Natural Cycle: 55												
Control Type: Actuated-Coordinated												



HCM 2010 Signalized Intersection Summary 2: Crosby Blvd & Mottman Rd

PM Peak Hour

Projected 2022 without improvements

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (veh/h)	180	250	25	5	30	85	45	425	155	135	690	455
Future Volume (vph)	180	250	25	5	30	85	45	425	155	135	690	455
Number	7	4	14	3	8	18	5	425	155	135	690	455
Initial Q (Q ₀), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped Bike Adj(A _{pb})	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/hln	1845	1845	1900	1900	1900	1881	1881	1881	1845	1845	1900	1900
Adj Flow Rate, veh/h	202	281	28	6	34	96	51	478	174	152	775	0
Adj No of Lanes	1	1	0	0	1	0	1	1	1	1	2	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh. %	3	3	3	0	0	0	1	1	1	3	3	3
Cap. veh/h	262	389	39	42	106	267	488	1269	1078	516	2364	0
Arrive On Green	0.24	0.24	0.24	0.24	0.24	0.24	0.67	0.67	0.67	0.67	0.67	0.00
Sat Flow, veh/h	1243	1651	165	21	452	1135	700	1881	1599	769	3597	0
Grp Volume(V _g), veh/h	202	0	309	136	0	0	51	478	174	152	775	0
Grp Sat Flow(S _g), veh/hln	1243	0	1816	1608	0	0	700	1881	1599	769	1752	0
Q Served(S _s), s	9.6	0.0	15.7	0.1	0.0	0.0	3.2	11.1	4.0	10.4	9.2	0.0
Cycle Q Clear(Q _c), s	23.6	0.0	15.7	16.9	0.0	0.0	11.2	11.1	4.0	20.2	9.2	0.0
Prop In Lane	1.00	0.09	0.04	0.09	0.04	0.71	1.00	1.00	1.00	1.00	0.00	0.00
Lane Grp Cap(c), veh/h	262	0	428	416	0	0	488	1269	1078	516	2364	0
W/C Ratio(X)	0.77	0.00	0.72	0.33	0.00	0.00	0.10	0.38	0.16	0.29	0.33	0.00
Avail Cap(c _a), veh/h	398	0	626	596	0	0	488	1269	1078	516	2364	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(f)	1.00	0.00	1.00	1.00	0.00	0.00	0.93	0.93	0.93	1.00	1.00	0.00
Uniform Delay(d _u), s/veh	41.3	0.0	35.2	31.8	0.0	0.0	8.9	7.1	5.9	11.2	6.8	0.0
Incr Delay(d ₂), s/veh	5.0	0.0	2.3	0.5	0.0	0.0	0.4	0.8	0.3	1.5	0.4	0.0
Initial Q Delay(d ₀), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackQ(50%), veh/h	5.9	0.0	8.1	3.2	0.0	0.0	0.7	6.0	1.8	2.4	4.5	0.0
LnGrp Delay(d _l), s/veh	46.3	0.0	37.5	32.2	0.0	0.0	9.3	7.9	6.2	12.6	7.2	0.0
LnGrp LOS	D	D	D	C	A	A	A	A	A	B	A	A
Approach Vol, veh/h	511	136	927	7.6	8.1	927	7.6	8.1	927	7.6	8.1	927
Approach Delay, s/veh	41.0	32.2	8.1	A	A	8.1	A	A	8.1	A	A	8.1
Approach LOS	D	C	A	A	A	A	A	A	A	A	A	A
Timer	1	2	3	4	5	6	7	8	8	8	8	8
Assigned Phs	2	2	4	6	8	8	8	8	8	8	8	8
Phs Duration (G+Y+R ₀), s	69.8	30.2	69.8	30.2	69.8	30.2	69.8	30.2	69.8	30.2	69.8	30.2
Change Period (Y+R ₀), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (G _{max}), s	56.5	34.5	56.5	34.5	56.5	34.5	56.5	34.5	56.5	34.5	56.5	34.5
Max Q Clear Time (Q _c +t ₁), s	13.2	25.6	22.2	18.9	22.2	18.9	22.2	18.9	22.2	18.9	22.2	18.9
Green Ext Time (Q _c), s	15.4	2.4	14.2	3.1	14.2	3.1	14.2	3.1	14.2	3.1	14.2	3.1
Intersection Summary												
HCM 2010 Crt Delay	16.8											
HCM 2010 LOS	B											

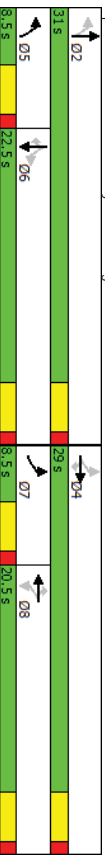
Lanes, Volumes, Timings 3: Crosby Blvd & Irving St

PM Peak Hour

Projected 2022 without improvements

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	75	25	25	30	40	185	25	340	25	160	485	100
Future Volume (vph)	75	25	25	30	40	185	25	340	25	160	485	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	200	0	150	200	0	0	0	0	250	250
Storage Lanes	0	0	1	0	1	1	0	0	0	1	1	1
Taper Length (ft)	25	25	25	25	25	25	25	25	25	25	25	25
Right Turn on Red	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Link Speed (mph)	30	30	30	30	30	30	30	30	30	30	30	30
Link Distance (ft)	468	468	468	468	468	468	468	468	468	468	468	468
Travel Time (s)	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	8%	8%	8%	1%	1%	1%	1%	1%	1%	2%	2%	2%
Shared Lane Traffic (%)	pm+pl	NA	Perm	Perm	NA	Perm	pm+pl	NA	Perm	NA	Perm	Perm
Turn Type	pm+pl	7	4	4	8	8	8	5	2	6	6	6
Protected Phases	7	4	4	8	8	8	8	5	2	6	6	6
Permitted Phases	4	4	4	8	8	8	8	5	2	6	6	6
Detector Phase	7	4	4	8	8	8	8	5	2	6	6	6
Switch Phase	7	4	4	8	8	8	8	5	2	6	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Spill (s)	8.5	20.5	20.5	20.5	20.5	20.5	20.5	8.5	20.5	20.5	20.5	20.5
Total Spill (s)	8.5	29.0	29.0	20.5	20.5	20.5	20.5	8.5	20.5	22.5	22.5	22.5
Total Split (%)	14.2%	48.3%	48.3%	34.2%	34.2%	34.2%	14.2%	51.7%	37.5%	37.5%	37.5%	37.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
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	4.5
Lead/Lag	Lead	Lead	Lag	Lag	Lag	Lag	Lead	Lead	Lag	Lag	Lag	Lag
Lead-Lag Optimizer?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	None	None	Max	Max	Max
Intersection Summary												
Area Type:	Other											
Cycle Length:	60											
Actuated Cycle Length:	47.6											
Natural Cycle:	65											
Control Type:	Actuated-Uncoordinated											

Spills and Phases: 3: Crosby Blvd & Irving St



HCM 2010 Signalized Intersection Summary

3: Crosby Blvd & Irving St

Projected 2022 without improvements
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	75	25	25	30	40	185	25	340	25	160	485	100
Future Volume (veh/h)	75	25	25	30	40	185	25	340	25	160	485	100
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped Bike Adj(A_pb7)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/hln	1900	1759	1759	1900	1881	1881	1881	1900	1863	1863	1863	0
Adj Flow Rate, veh/h	84	28	28	34	45	208	28	382	28	180	545	0
Adj No of Lanes	0	1	1	0	1	1	1	0	1	1	1	1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh. %	8	8	8	1	1	1	1	1	2	2	2	2
Arrive On Green	0.19	0.19	0.19	0.19	0.19	0.19	0.03	0.60	0.60	0.47	0.47	0.00
Sat Flow, veh/h	15	142	1495	392	1047	1599	1792	1732	127	972	1863	1583
Grip Volume(V), veh/h	112	0	28	79	0	208	28	0	410	180	545	0
Grip Sat Flow(s), veh/hln	156	0	1495	1439	0	1599	1792	0	1859	972	1863	1583
Q Serve(s), s	3.7	0.0	0.7	0.1	0.0	5.3	0.3	0.0	5.0	5.3	9.6	0.0
Cycle Q Clear(g,c), s	3.7	0.0	0.7	0.3	0.0	5.3	0.3	0.0	5.0	5.3	9.6	0.0
Prop In Lane	0.75	1.00	0.43	1.00	1.00	1.00	1.00	0.07	1.00	0.07	1.00	1.00
Lane Grp Cap(c), veh/h	0	0	291	397	0	311	431	0	1117	623	880	748
V/C Ratio(X)	0.00	0.00	0.10	0.20	0.00	0.67	0.06	0.00	0.37	0.29	0.62	0.00
Avail Cap(c), veh/h	0	0	831	668	0	580	546	0	1117	623	880	748
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(f)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	14.6	14.9	0.0	16.4	6.2	0.0	4.5	7.5	8.7	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.1	0.2	0.0	2.5	0.1	0.0	0.9	1.2	3.3	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackQ(50%), veh/h	0.0	0.0	0.3	0.8	0.0	2.5	0.2	0.0	2.8	1.6	5.6	0.0
LnGrp Delay(d), s/veh	0.0	0.0	14.7	15.2	0.0	18.9	6.3	0.0	5.4	8.7	11.9	0.0
LnGrp LOS			B	B		B	A		A	A	B	
Approach Vol, veh/h	140				287			438			725	
Approach Delay, s/veh	2.9				17.9			5.5			11.1	
Approach LOS	A				B			A			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rd), s		31.0		13.1	5.7	25.3		13.1				
Change Period (Y+Rd), s		4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s		26.5		4.0	18.0	16.0		16.0				
Max Q Clear Time (G+ch1), s		7.0		5.7	2.3	11.6		7.3				
Green Ext Time (p,c), s		7.3		1.9	0.0	3.6		1.3				
Intersection Summary												
HCM 2010 Ctrl Delay												
HCM 2010 LOS												

HCM 2010 AWSC

4: Irving St & 7th Ave

Projected 2022 without improvements
PM Peak Hour

Intersection												
Intersection Delay, s/veh	8.6											
Intersection LOS	A											
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	5	15	175	0	1	20	1	0	185	5	1
Future Vol, veh/h	0	5	15	175	0	1	20	1	0	185	5	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	1	1	1	2	0	0	0	2	1	1	1
Mvmt Flow	0	5	16	190	0	1	22	1	0	201	5	1
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0
Approach												
Opposing Approach	WB				WB				NB			
Opposing Lanes	WB				WB				NB			
Conflicting Approach Left	SB				NB				EB			
Conflicting Lanes Left	1				1				1			
Conflicting Approach Right	NB				SB				WB			
Conflicting Lanes Right	1				1				1			
HCM Control Delay	8.1				7.8				9.3			
HCM LOS	A				A				A			
Lane	NBLn1	EBLn1	WBLn1	SBLn1								
Vol Left, %	97%	3%	5%	0%								
Vol Thru, %	3%	8%	91%	50%								
Vol Right, %	1%	90%	5%	50%								
Sign Control	Stop	Stop	Stop	Stop								
Traffic Vol by Lane	191	195	22	10								
LT Vol	185	5	1	0								
Through Vol	5	15	20	5								
RT Vol	1	175	1	5								
Lane Flow Rate	208	212	24	11								
Geometry Grp	1	1	1	1								
Degree of Util(X)	0.261	0.232	0.031	0.013								
Departure Headway (Hd)	4.631	3.943	4.629	4.335								
Convergence, Y/N	Yes	Yes	Yes	Yes								
Cap	781	916	776	826								
Service Time	2.631	1.945	2.638	2.357								
HCM Lane V/C Ratio	0.266	0.231	0.031	0.013								
HCM Control Delay	9.3	8.1	7.8	7.4								
HCM Lane LOS	A	A	A	A								
HCM 95th-ile Q	1	0.9	0.1	0								

HCM 2010 AWSC
4: Irving St & 7th Ave

Projected 2022 without improvements
PM Peak Hour

Intersection					
Intersection Delay, s/veh					
Intersection LOS					
Movement	SBU	SBL	SBT	SBR	
Traffic Vol, veh/h	0	0	5	5	
Future Vol, veh/h	0	0	5	5	
Peak Hour Factor	0.92	0.92	0.92	0.92	
Heavy Vehicles, %	2	0	0	0	
Mvmt Flow	0	0	5	5	
Number of Lanes	0	0	1	0	
Approach	SB				
Opposing Approach	NB				
Opposing Lanes	1				
Conflicting Approach Left	WB				
Conflicting Lanes Left	1				
Conflicting Approach Right	EB				
Conflicting Lanes Right	1				
HCM Control Delay	7.4				
HCM LOS	A				
ane					

HCM 2010 TWSC
5: Crosby Blvd & Barnes Rd

Projected 2022 without improvements
PM Peak Hour

Intersection				
Int Delay s/vph				
6.3				
Movement	EBL	EBT	EBR	WBL
Traffic Vol, veh/h	10	1	0	10
Future Vol, veh/h	10	1	0	10
Peak Hour Factor	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-
Storage Length	-	-	-	0
Veh in Median Storage, #	-	0	-	-
Grade, %	-	0	-	-
Peak Hour Factor	91	91	91	91
Heavy Vehicles, %	10	10	10	2
Mvmt Flow	11	1	0	11

Major/Minor	Minor2	Minor1	Major1	Major2
Conflicting Flow All	893	893	181	890
Stage 1	764	764	-	126
Stage 2	129	129	-	764
Critical Hdwy	7.2	6.6	6.3	7.12
Critical Hdwy Sig 1	6.2	5.6	-	6.12
Critical Hdwy Sig 2	6.2	5.6	-	6.12
Follow-up Hdwy	3.59	4.09	3.39	3.518
Poi Cap-1 Maneuver	254	273	841	264
Stage 1	384	401	-	878
Stage 2	856	774	-	396
Platoon blocked, %	157	218	841	223
Mov Cap-1 Maneuver	157	218	-	223
Mov Cap-2 Maneuver	384	321	-	877
Stage 1	633	773	-	316
Stage 2	-	-	-	327

Approach	EB	WB	NB	SB
HCM Control Delay, s	29.2	11	-	0.1
HCM LOS	D	B	-	-
Minor Lane/Major Mvmt	NBL	NBT	NBR	NBL
Capacity (veh/h)	1370	-	-	161
HCM Lane V/C Ratio	0.001	-	-	0.075
HCM Control Delay (s)	7.6	0	-	29.2
HCM Lane LOS	A	A	-	D
HCM 95th %ile Q(veh)	0	-	-	0.2

HCM 2010 TWSC
6: Black Lake Belmore Rd & Black Lake Blvd

Projected 2022 without improvements
PM Peak Hour

Intersection											
Int Delay, s/veh		23									
Movement	EBT	EBR	WBL	WBT	NBL	NBR					
Traffic Vol, veh/h	175	75	165	330	190	135					
Future Vol, veh/h	175	75	165	330	190	135					
Conflicting Peds, #/hr	0	0	0	0	0	0					
Sign Control	Free	Free	Free	Free	Stop	Stop					
RT Channelized	-	None	-	None	-	None					
Storage Length	-	-	250	-	0	-					
Vel in Median Storage, #	0	-	-	0	0	-					
Grade, %	0	-	-	0	0	-					
Peak Hour Factor	94	94	94	94	94	94					
Heavy Vehicles, %	3	3	0	0	1	1					
Mvmt Flow	186	80	176	351	202	144					

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	0	266	0	928
Stage 1	-	-	226	-
Stage 2	-	-	702	-
Critical Hdwy	-	4.1	6.41	6.21
Critical Hdwy Sig 1	-	-	5.41	-
Critical Hdwy Sig 2	-	-	5.41	-
Follow-up Hdwy	-	2.2	3.509	3.309
Pot Cap-1 Maneuver	-	1310	299	816
Stage 1	-	-	814	-
Stage 2	-	-	493	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	1310	259	816
Mov Cap-2 Maneuver	-	-	259	-
Stage 1	-	-	814	-
Stage 2	-	-	427	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.7	71.7
HCM LOS			F
Minor Lane/Major Mvmt	NBLn1	EBR	WBL
Capacity (veh/h)	361	-	1310
HCM Lane V/C Ratio	0.958	-	0.134
HCM Control Delay (s)	71.7	-	8.2
HCM Lane LOS	F	-	A
HCM 95th %ile Q(veh)	10.5	-	0.5

HCM 2010 TWSC
7: RW Johnson Rd & Sapp Rd

Projected 2022 without improvements
PM Peak Hour

Intersection											
Int Delay, s/veh		5.7									
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Traffic Vol, veh/h	15	30	2	10	45	80	1	10	10	95	15
Future Vol, veh/h	15	30	2	10	45	80	1	10	10	95	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	None
Storage Length	-	-	-	-	0	-	-	-	-	-	-
Vel 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
Heavy Vehicles, %	3	3	3	1	1	1	0	0	0	3	3
Mvmt Flow	18	35	2	12	53	94	1	12	12	112	18

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	147	0	0	225
Stage 1	-	-	72	72
Stage 2	-	-	153	171
Critical Hdwy	4.13	-	4.11	-
Critical Hdwy Sig 1	-	-	6.1	6.5
Critical Hdwy Sig 2	-	-	6.1	5.5
Follow-up Hdwy	2.227	-	2.209	-
Pot Cap-1 Maneuver	1429	-	1579	-
Stage 1	-	-	943	839
Stage 2	-	-	854	761
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	1429	-	1579	-
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	931	828
Stage 2	-	-	792	755

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.4	0.5	9.7	11.1
HCM LOS			A	B
Minor Lane/Major Mvmt	NBLn1	EBL	EBR	WBL
Capacity (veh/h)	792	1429	-	1579
HCM Lane V/C Ratio	0.031	0.012	-	0.007
HCM Control Delay (s)	9.7	7.6	-	7.3
HCM Lane LOS	A	A	-	A
HCM 95th %ile Q(veh)	0.1	0	-	0

HCM 2010 TWSC
8: Sapp Rd & Crosby Blvd

Projected 2022 without improvements
PM Peak Hour

Intersection						
Int Delay, s/veh	6.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	100	15	155	100	15	130
Future Vol, veh/h	100	15	155	100	15	130
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	250	0	-	-	0	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	1	1	1	1	0	0
Wmtl Flow	110	16	170	110	16	143

Major/Minor	Minor1		Major1		Minor2	
Conflicting Flow All	296	225	0	0	225	280
Stage 1	225	-	-	0	0	0
Stage 2	71	-	-	-	225	280
Critical Hdwy	7.11	6.21	-	-	7.1	6.5
Critical Hdwy Sig 1	6.11	-	-	-	-	-
Critical Hdwy Sig 2	-	-	-	-	6.1	5.5
Follow-up Hdwy	3.509	3.309	-	-	3.5	4
Plat Cap-1 Maneuver	658	817	-	-	735	632
Stage 1	780	-	-	-	-	-
Stage 2	-	-	-	-	782	683
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	543	817	-	-	720	632
Mov Cap-2 Maneuver	543	-	-	-	720	632
Stage 1	780	-	-	-	-	-
Stage 2	-	-	-	-	766	683

Approach	WB		NB		SB	
HCM Control Delay, s	12.8		0		12.2	
HCM LOS	B				B	
Minor Lane/Minor Wmtl						
NBT	NBR	WBL	WBR	N2	SBL	N2
Capacity (veh/h)	-	543	817	720	632	
HCM Lane V/C Ratio	-	0.202	0.02	0.023	0.226	
HCM Control Delay (s)	-	13.3	9.5	10.1	12.4	
HCM Lane LOS	-	B	A	B	B	
HCM 95th %ile Q(veh)	-	0.8	0.1	0.1	0.9	

SimTraffic Performance Report

Projected 2022 without improvements
PM Peak Hour

9: Black Lake Belmore Rd & 49th Ave Performance by movement													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Denied Del/Veh (s)	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	
Total Del/Veh (s)	5.7	7.1	3.3	7.6	8.3	4.7	7.8	8.5	5.6	0.8	1.1	0.7	

9: Black Lake Belmore Rd & 49th Ave Performance by movement

Movement	All
Denied Del/Veh (s)	0.2
Total Del/Veh (s)	4.6

Lanes, Volumes, Timings

Projected 2022 without improvements

PM Peak Hour

10: Capitol Blvd & Sunset Way & Carlyon Ave

Lane Group	WBL2	WBL	WBR	NBL	NBR	NBR2	NET	NER	NER2	SWL2	SWL	SWT
Lane Configurations												
Traffic Volume (vph)	5	55	40	35	15	2	565	90	15	50	10	995
Future Volume (vph)	5	55	40	35	15	2	565	90	15	50	10	995
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0	0	0	0	0	0	0	0	150	1
Storage Lanes	1	0	1	0	1	0	0	0	0	0	1	1
Taper Length (ft)	25	0	25	0	25	0	0	0	0	25	0	0
Right Turn on Red	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Link Speed (mph)	30	30	30	30	30	30	30	30	30	30	30	30
Link Distance (ft)	840	629	629	14.3	16.6	731	16.6	18.0	18.0	18.0	18.0	18.0
Travel Time (s)	19.1	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles (%)	0%	0%	0%	0%	0%	2%	2%	2%	2%	1%	1%	1%
Shared Lane Traffic (%)	Prot	Prot	Prot	Prot	Prot	NA	NA	Prot	Prot	Prot	Prot	NA
Turn Type	Prot	Prot	Prot	Prot	Prot	NA	NA	Prot	Prot	Prot	Prot	NA
Protected Phases	8	8	4	4	2	2	2	1	1	1	1	6
Detector Phase	8	8	4	4	2	2	2	1	1	1	1	6
Switch Phase	6.0	6.0	6.0	6.0	10.0	10.0	10.0	6.0	6.0	6.0	6.0	10.0
Minimum Initial (s)	29.5	29.5	21.5	29.5	29.5	29.5	29.5	10.5	10.5	10.5	20.0	20.0
Minimum Spill (s)	29.5	29.5	21.5	29.5	29.5	29.5	29.5	13.5	13.5	13.5	44.0	44.0
Total Spill (s)	31.1%	31.1%	22.6%	32.1%	32.1%	32.1%	32.1%	14.2%	14.2%	14.2%	46.3%	46.3%
Total Split (%)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Yellow Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Allied Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lost Time Adjust (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
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	4.5
Lead/Lag	Lag	Lag	Lag	Lag	Lag	Lag	Lag	Lag	Lag	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	None	None	None	None	Max
Area Type:	Other											
Cycle Length: 95												
Actuated Cycle Length: 62.4												
Natural Cycle: 95												
Control Type: Actuated-Uncoordinated												

Splits and Phases: 10: Capitol Blvd & Sunset Way & Carlyon Ave

01	02	04	08
13.5 s	30.5 s	21.5 s	29.5 s
06			
4 s			

HCM Signalized Intersection Capacity Analysis

Projected 2022 without improvements

PM Peak Hour

10: Capitol Blvd & Sunset Way & Carlyon Ave

Movement	WBL2	WBL	WBR	NBL	NBR	NBR2	NET	NER	NER2	SWL2	SWL	SWT
Lane Configurations												
Traffic Volume (vph)	5	55	40	35	15	2	565	90	15	50	10	995
Future Volume (vph)	5	55	40	35	15	2	565	90	15	50	10	995
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	4.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	1.00	0.95	0.95
Fit	0.95	0.95	0.96	0.97	0.97	0.96	0.98	0.98	0.98	1.00	1.00	1.00
Fit Protected	0.97	0.97	0.97	0.97	0.97	0.97	1.00	1.00	1.00	0.95	1.00	1.00
Satd Flow (pro)	1745	1745	1757	1757	1787	3456	3456	3456	3456	1787	3574	3574
Fit Permitted	0.97	0.97	0.97	0.97	0.97	0.97	1.00	1.00	1.00	0.95	1.00	1.00
Satd Flow (perm)	1745	1745	1757	1757	1787	3456	3456	3456	3456	1787	3574	3574
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	6	65	47	41	18	2	665	106	18	59	12	1171
RTOR Reduction (vph)	0	108	0	58	0	0	1	0	0	0	0	0
Lane Group Flow (vph)	0	10	0	3	0	0	788	0	0	0	71	1171
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	2%	2%	2%	1%	1%	1%
Turn Type	Prot	Prot	Prot	Prot	Prot	NA	NA	Prot	Prot	Prot	Prot	NA
Protected Phases	8	8	4	4	2	2	2	1	1	1	1	6
Permitted Phases												
Actuated Green, G (s)	5.4	5.4	3.4	3.4	32.9	32.9	32.9	6.5	6.5	43.9	43.9	43.9
Effective Green, g (s)	5.4	5.4	3.4	3.4	32.9	32.9	32.9	6.5	6.5	43.9	43.9	43.9
Actuated g/C Ratio	0.08	0.08	0.05	0.05	0.10	0.10	0.10	0.10	0.10	0.66	0.66	0.66
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	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	3.0
Lane Grp Cap (vph)	142	142	90	175	1717	1717	1717	0.23	0.23	0.74	2370	2370
W/S Ratio Prot	60.01	60.01	60.00	60.00	0.23	0.23	0.23	0.04	0.04	0.33	60.33	60.33
W/S Ratio Perm												
v/C Ratio	0.07	0.07	0.03	0.03	0.46	0.46	0.46	0.04	0.04	0.49	0.49	0.49
Uniform Delay, d1	28.1	28.1	29.8	28.0	10.8	10.8	10.8	28.0	28.0	5.6	5.6	5.6
Progression Factor	1.00	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	0.2	0.2	0.2	0.2	0.9	0.9	0.9	1.5	1.5	0.7	0.7	0.7
Delay (s)	28.3	28.3	30.0	28.3	11.7	11.7	11.7	29.6	29.6	6.3	6.3	6.3
Level of Service	C	C	C	C	B	B	B	C	C	A	A	A
Approach Delay (s)	28.3	28.3	30.0	28.3	11.7	11.7	11.7	29.6	29.6	6.3	6.3	6.3
Approach LOS	C	C	C	C	B	B	B	C	C	A	A	A
Intersection Summary												
HCM 2000 Control Delay	10.8											
HCM 2000 Volume to Capacity ratio	0.46											
Actuated Cycle Length (s)	66.2											
Intersection Capacity Utilization	49.7%											
Analysis Period (min)	15											
C Critical Lane Group												

HCM 2010 TWSC
11 : Deschutes Way & I-5 NB On-Ramp

Projected 2022 without improvements
PM Peak Hour

Intersection						
Int Delay, s/veh		1.7				
Movement	SEL	SET	NWT	NWR	SWL	SWR
Traffic Vol, veh/h	160	325	245	140	0	0
Future Vol, veh/h	160	325	245	140	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	0	0	-
Grade, %	-	0	0	0	0	-
Peak Hour Factor	79	79	79	79	79	79
Heavy Vehicles, %	0	0	1	1	0	0
Mvmt Flow	203	411	310	177	0	0

Major/Minor	Major1	Major2	Minor2	
Conflicting Flow All	487	0	1215	399
Stage 1	-	-	399	-
Stage 2	-	-	816	-
Critical Hdwy	4.1	-	6.4	6.2
Critical Hdwy Sig 1	-	-	5.4	-
Critical Hdwy Sig 2	-	-	5.4	-
Follow-up Hdwy	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	1086	-	202	655
Stage 1	-	-	662	-
Stage 2	-	-	438	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	1086	-	153	655
Mov Cap-2 Maneuver	-	-	153	-
Stage 1	-	-	682	-
Stage 2	-	-	332	-

Approach	SE	NW	SW	
HCM Control Delay, s	3	0	0	
HCM LOS			A	
Minor Lane/Major Mvmt	NWT	NWR	SEL	SET/SL/MT
Capacity (veh/h)	-	1086	-	-
HCM Lane V/C Ratio	-	0.186	-	-
HCM Control Delay (s)	-	9.1	0	0
HCM Lane LOS	-	A	A	A
HCM 95th %ile Q(veh)	-	0.7	-	-

HCM 2010 TWSC
12 : Deschutes Way & US 101 WB On-Ramp

Projected 2022 without improvements
PM Peak Hour

Intersection							
Int Delay, s/veh		3.8					
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Traffic Vol, veh/h	0	0	450	400	285	20	
Future Vol, veh/h	0	0	450	400	285	20	
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	92	92	92	92	92	92	
Heavy Vehicles, %	0	0	1	1	0	0	
Mvmt Flow	0	0	489	435	310	22	

Major/Minor	Minor2	Major1	Major2	
Conflicting Flow All	1734	332	0	0
Stage 1	321	-	-	-
Stage 2	1413	-	-	-
Critical Hdwy	6.4	-	4.11	-
Critical Hdwy Sig 1	5.4	-	-	-
Critical Hdwy Sig 2	5.4	-	-	-
Follow-up Hdwy	3.5	-	2.209	-
Pot Cap-1 Maneuver	98	0	1233	-
Stage 1	740	0	-	-
Stage 2	227	0	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	59	-	1233	-
Mov Cap-2 Maneuver	59	-	-	-
Stage 1	740	-	-	-
Stage 2	137	-	-	-

Approach	EB	NB	SB	
HCM Control Delay, s	0	5.2	0	
HCM LOS	A			
Minor Lane/Major Mvmt	NBL	NBT/EBL/MT	SBT	SBR
Capacity (veh/h)	1233	-	-	-
HCM Lane V/C Ratio	0.397	-	-	-
HCM Control Delay (s)	9.8	0	-	-
HCM Lane LOS	A	A	-	-
HCM 95th %ile Q(veh)	1.9	-	-	-

SimTraffic Performance Report

Projected 2022 without improvements
PM Peak Hour







13: 2nd Ave/US 101/I-5 Off-Ramps Performance by movement

Movement	EBR	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	0.2	0.0	0.0	0.4	0.4	0.3
Total Del/Veh (s)	0.7	1.0	1.0	24.0	10.0	16.7

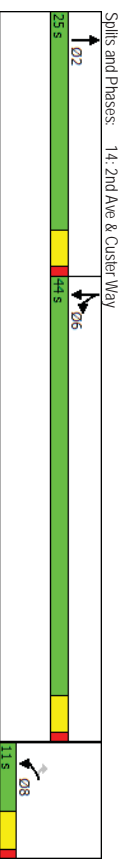
Lanes, Volumes, Timings

Projected 2022 without improvements
PM Peak Hour

14: 2nd Ave & Custer Way







Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	175	180	20	210	840	255
Future Volume (vph)	175	180	20	210	840	255
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	225	0	0	0	0
Storage Lanes	1	1			1	
Taper Length (ft)	25				25	
Right Turn on Red		Yes		Yes		
Link Speed (mph)	30		30		30	
Link Distance (ft)	662		2035		505	
Travel Time (s)	15.0		46.3		11.5	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	
Heavy Vehicles (%)	1%	1%	1%	1%	0%	
Shared Lane Traffic (%)						
Turn Type	Prot	Perm	NA		Spill	NA
Protected Phases	8		2		6	6
Permitted Phases	8	8	2		6	6
Detector Phase	8	8	2		6	6
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0		4.0	4.0
Minimum Spill (s)	100	100	24.5		20.0	20.0
Total Spill (s)	110	110	25.0		44.0	44.0
Total Split (%)	13.8%	13.8%	31.3%		55.0%	55.0%
Yellow Time (s)	3.5	3.5	3.5		3.5	3.5
All-Red Time (s)	1.0	1.0	1.0		1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5		4.5	4.5
Lead-Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	None		Max	Max

Intersection Summary					
Area Type:	Other				
Cycle Length:	80				
Actuated Cycle Length:	66.9				
Natural Cycle:	90				
Control Type:	Actuated-Uncoordinated				



HCM 2010 Signalized Intersection Summary 14: 2nd Ave & Custer Way

Projected 2022 without improvements
PM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT		
Lane Configurations								
Traffic Volume (veh/h)	175	180	20	210	840	255		
Future Volume (veh/h)	175	180	20	210	840	255		
Number	3	18	2	12	1	6		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped/Bike Adj(A_pb7)	1.00	1.00	1.00	1.00	1.00	1.00		
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/hln	1881	1881	1881	1900	1900	1900		
Adj Flow Rate, veh/h	199	40	23	74	955	290		
Adj No. of Lanes	1	1	1	0	1	1		
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88		
Percent Heavy Veh. %	1	1	1	1	0	0		
Cap. veh/h	181	161	30	96	1110	1165		
Arrive On Green	0.10	0.10	0.08	0.08	0.61	0.61		
Sat Flow, veh/h	1792	1599	393	1265	1810	1900		
Grip Volume(V), veh/h	199	40	0	97	955	290		
Grip Sat Flow(s), veh/hln	1792	1599	0	1658	1810	1900		
Q Serve(q,s), s	6.5	1.5	0.0	3.7	27.8	4.5		
Cycle Q Clear(q,c), s	6.5	1.5	0.0	3.7	27.8	4.5		
Prop In Lane	1.00	1.00	0.76	1.00				
Lane Grip Cap(c), veh/h	181	161	0	126	1110	1165		
V/C Ratio(X)	1.10	0.25	0.00	0.77	0.86	0.25		
Avail Cap(c,a), veh/h	181	161	0	528	1110	1165		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(f)	1.00	1.00	0.00	1.00	1.00	1.00		
Uniform Delay (d), s/veh	289	26.7	0.0	29.2	10.2	5.7		
Incr Delay (d2), s/veh	96.4	0.3	0.0	3.7	8.8	0.5		
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackQ(50%), veh/h	8.0	0.7	0.0	1.8	16.2	2.5		
LnGrp Delay(d), s/veh	125.3	27.0	0.0	32.9	19.0	6.2		
LnGrp LOS	F	C		C	B	A		
Approach Vol, veh/h	239		97		1245			
Approach Delay, s/veh	108.9		32.9		16.0			
Approach LOS	F		C		B			
Timer	1	2	3	4	5	6	7	8
Assigned PIs		2				6		8
PIs Duration (G+Y+R), s		9.4				44.0		11.0
Change Period (Y+R), s		4.5				4.5		4.5
Max Green Setting (Gmax), s		20.5				39.5		6.5
Max Q Clear Time (q_c+H), s		5.7				29.8		8.5
Green Ext Time (p_c), s		0.3				4.2		0.0
Intersection Summary								
HCM 2010 Crt Delay	31.1							
HCM 2010 LOS	C							

HCM 2010 TWSC 15: Boston St & Custer Way

Projected 2022 without improvements
PM Peak Hour

Intersection	5.2													
Int Delay, s/veh	5.2													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Traffic Vol, veh/h	0	785	175	380	335	5	0	1	165	0	1	5		
Future Vol, veh/h	0	785	175	380	335	5	0	1	165	0	1	5		
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	-	-	-	425	-	-	-	-	-	-	-	-		
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	-	-		
Grade, %	-	0	-	-	0	-	-	0	-	-	-	0		
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95		
Heavy Vehicles, %	1	1	1	1	1	1	0	0	0	0	0	0		
Mvmt Flow	0	826	184	400	353	5	0	1	174	0	1	5		

Major/Minor	Major1	Major2	Minor1	Minor2								
Conflicting Flow All	358	0	0	1011	0	0	-	2076	505	1569	2166	355
Stage 1	-	-	-	-	-	-	-	918	-	1155	1155	-
Stage 2	-	-	-	-	-	-	-	1158	-	414	1011	-
Critical Hdwy	4.115	-	-	4.115	-	-	-	6.5	6.9	7.3	6.5	6.2
Critical Hdwy Sig 1	-	-	-	-	-	-	-	5.5	-	6.1	5.5	-
Critical Hdwy Sig 2	-	-	-	-	-	-	-	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2095	-	-	2.2095	-	-	-	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1205	-	-	689	-	-	-	0	54	518	83	48
Stage 1	-	-	-	-	-	-	-	0	353	-	242	274
Stage 2	-	-	-	-	-	-	-	0	273	-	592	320
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1205	-	-	689	-	-	-	-	23	518	29	20
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	23	-	29	20
Stage 1	-	-	-	-	-	-	-	-	353	-	242	115
Stage 2	-	-	-	-	-	-	-	-	115	-	392	320
Approach	EB	WB	NB	SB								
HCM Control Delay, s	0	9.1	17.6	41.5								
HCM LOS			C	E								
Minor Lane/Minor Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	459	1205	-	-	689	-	-	105				
HCM Lane V/C Ratio	0.381	-	-	-	0.581	-	-	0.06				
HCM Control Delay (s)	17.6	0	-	-	17.2	-	-	41.5				
HCM Lane LOS	C	A	-	-	C	-	-	E				
HCM 95th %tile Q(veh)	1.8	0	-	-	3.8	-	-	0.2				

Lanes, Volumes, Timings
18: Capitol Blvd & Custer Way

Projected 2022 without improvements
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	180	705	75	395	495	10	20	415	485	25	530	165
Traffic Volume (vph)	180	705	75	395	495	10	20	415	485	25	530	165
Future Volume (vph)	180	705	75	395	495	10	20	415	485	25	530	165
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150	0	0	0	100	0	100	0	100	0	100	0
Storage Lanes	1	0	1	1	0	1	0	1	0	1	0	1
Taper Length (ft)	25	0	25	0	25	0	25	0	25	0	25	0
Right Turn on Red	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Link Speed (mph)	30	684	30	631	14.3	45.9	2019	1179	26.8	0.90	0.90	0.90
Travel Time (s)	15.5	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Peak Hour Factor	0.90	1%	1%	1%	1%	1%	1%	1%	1%	0%	0%	0%
Heavy Vehicles (%)	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
Shared Lane Traffic (%)	Split	NA	Split	NA	Prot	NA	Prot	NA	Prot	NA	Prot	NA
Turn Type	4	4	8	8	5	2	1	6	6	6	6	6
Permitted Phases	4	4	8	8	5	2	1	6	6	6	6	6
Detector Phase	4	4	8	8	5	2	1	6	6	6	6	6
Switch Phase	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Minimum Initial (s)	22.0	22.0	22.0	22.0	12.5	22.0	12.5	22.0	12.5	22.0	12.5	22.0
Minimum Spill (s)	25.0	25.0	30.0	30.0	12.5	22.5	12.5	22.5	12.5	22.5	12.5	22.5
Total Split (s)	27.8%	27.8%	33.3%	33.3%	13.9%	25.0%	13.9%	25.0%	13.9%	25.0%	13.9%	25.0%
Total Spill (%)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Yellow Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lost Time Adjust (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
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	4.5
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimizer?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	None	None	None	None	None

Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	82.5
Natural Cycle:	140
Control Type:	Actuated-Uncoordinated

Splits and Phases: 18: Capitol Blvd & Custer Way

01	02	04	08
12.5 s	22.5 s	25 s	30 s
05	06		
12.5 s	22.5 s		

HCM 2010 Signalized Intersection Summary
18: Capitol Blvd & Custer Way

Projected 2022 without improvements
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	180	705	75	395	495	10	20	415	485	25	530	165
Traffic Volume (veh/h)	180	705	75	395	495	10	20	415	485	25	530	165
Future Volume (veh/h)	180	705	75	395	495	10	20	415	485	25	530	165
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped Bike Adj (Adj _b), veh	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/hln	1881	1881	1900	1881	1881	1900	1881	1881	1900	1900	1900	1900
Adj Flow Rate, veh/h	200	783	0	439	550	11	22	461	256	28	589	183
Adj No of Lanes	1	2	1	1	1	0	1	2	0	1	2	0
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
Percent Heavy Veh. %	1	1	1	1	1	1	1	1	1	1	1	1
Cap. veh/h	419	880	0	535	549	11	68	469	259	82	593	184
Arrive On Green	0.23	0.23	0.00	0.30	0.30	0.30	0.04	0.21	0.05	0.22	0.22	0.22
Sat Flow, veh/h	1792	3762	0	1792	1838	37	1792	2224	1227	1810	2715	842
Gp Volume(v), veh/h	200	783	0	439	0	561	22	370	347	28	391	381
Gp Sat Flow(s), veh/hln	1792	1881	0	1792	0	1875	1792	1787	1665	1810	1805	1751
Q Serve(g), s	8.2	17.2	0.0	19.4	0.0	25.5	1.0	17.6	17.7	1.3	18.5	18.5
Cycle Q Clear(g), s	8.2	17.2	0.0	19.4	0.0	25.5	1.0	17.6	17.7	1.3	18.5	18.5
Prop In Lane	1.00	0.00	1.00	0.02	1.00	0.74	1.00	0.74	1.00	0.74	1.00	0.48
Lane Gp Cap(c), veh/h	419	880	0	535	0	560	68	377	351	82	394	382
A/C Ratio(X)	0.48	0.89	0.00	0.82	0.00	1.00	0.32	0.98	0.99	0.34	0.99	1.00
Avail Cap(C-a), veh/h	430	904	0	535	0	560	168	377	351	170	394	382
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Filter(f)	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.2	31.6	0.0	27.8	0.0	29.9	40.0	33.5	33.6	39.5	33.3	33.3
Initial Delay (d2), s/veh	0.8	10.7	0.0	9.8	0.0	38.4	2.7	41.9	45.4	2.4	43.6	45.1
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackQ(50%), veh/h	4.2	10.2	0.0	11.1	0.0	19.0	0.6	13.0	12.5	0.7	13.9	13.7
LnGrp Delay(d), s/veh	29.0	42.3	0.0	37.6	0.0	68.3	42.7	75.4	78.9	41.9	76.9	78.4
LnGrp LOS	C	D	D	D	D	F	D	E	E	D	E	E
Approach Vol, veh/h	983	983	1000	739	800	76.4	76.4	76.4	76.4	76.4	76.4	76.4
Approach Delay, s/veh	39.6	39.6	54.8	76.1	76.1	76.4	76.4	76.4	76.4	76.4	76.4	76.4
Approach LOS	D	D	D	E	E	E	E	E	E	E	E	E

Assigned PIs: 1 2 3 4 5 6 8

Pis Duration (G+Y+R), s	8.4	22.5	24.5	7.8	23.1	30.0	4.5	4.5	4.5	4.5	4.5	4.5
Change Period (Y+R), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	8.0	18.0	20.5	8.0	18.0	25.5	8.0	18.0	20.5	27.5	27.5	27.5
Max O Clear Time (G+Y+R), s	3.3	19.7	19.2	3.0	20.5	27.5	3.0	20.5	27.5	27.5	27.5	27.5
Green Ext Time (P.C.), s	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary

HCM 2010 Cnt Delay	59.9
HCM 2010 LOS	E

Turnwater Transportation Master Plan

SCJ Alliance

Synchro 9 Report

6/10/2016

Lanes, Volumes, Timings

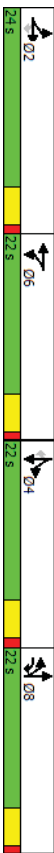
Projected 2022 without improvements

PM Peak Hour

19: Cleveland Ave & Custer Way/North St

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	385	700	15	300	70	530	155	15	110	310	115
Future Volume (vph)	55	385	700	15	300	70	530	155	15	110	310	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100	0	200	0	300	0	300	1900	0	150	1900	150
Storage Lanes	1	1	1	1	1	1	1	1	1	1	1	1
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes		Yes		Yes		Yes		Yes	
Link Speed (mph)		30			30		30		30		30	
Link Distance (ft)		631			2207		2922		2922		341	
Travel Time (s)		14.3			50.2		66.4		66.4		7.8	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	2%	2%	2%
Shared Lane Traffic (%)												
Turn Type	Split	NA	pm+ov	Split	NA	Split	NA	Split	NA	Split	NA	Perm
Protected Phases	2	2	8	6	6	8	8	8	8	4	4	4
Permitted Phases	2	2	8	6	6	8	8	8	8	4	4	4
Detector Phase	2	2	8	6	6	8	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	6.0	6.0	8.0	6.0	6.0	8.0	8.0	8.0	8.0	6.0	6.0	6.0
Minimum Spill (s)	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	24.0	24.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
Total Spill (%)	26.7%	26.7%	24.4%	24.4%	24.4%	24.4%	24.4%	24.4%	24.4%	24.4%	24.4%	24.4%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag												
Lead/Lag Optimizer?												
Recall Mode	None	None	None	None	None	None	None	None	None	None	None	None
Intersection Summary												
Area Type:	Other											
Cycle Length: 90												
Actuated Cycle Length: 90												
Natural Cycle: 90												
Control Type: Actuated-Uncoordinated												

Splits and Phases: 19: Cleveland Ave & Custer Way/North St



HCM 2010 Signalized Intersection Summary

Projected 2022 without improvements

PM Peak Hour

19: Cleveland Ave & Custer Way/North St

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	385	700	15	300	70	530	155	15	110	310	115
Future Volume (veh/h)	55	385	700	15	300	70	530	155	15	110	310	115
Number	5	2	12	1	6	16	3	18	7	4	14	14
Initial Q (Ob.) veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped Bike Adj (Adj) b/h	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/hln	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881
Adj Flow Rate, veh/h	59	414	645	16	323	75	570	167	16	118	333	33
Adj No of Lanes	1	1	1	1	1	1	1	1	1	1	1	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh. %	1	1	1	1	1	1	1	1	1	2	2	2
Arrive On Green	0.21	0.21	0.21	0.19	0.19	0.19	0.18	0.18	0.18	0.19	0.19	0.19
Sat Flow veh/h	1792	1881	1599	1792	1478	343	3583	1691	162	1774	1863	1583
Gp Volume(v), veh/h	59	414	645	16	0	398	570	0	183	118	333	33
Gp Sat Flow(s), veh/hln	1792	1881	1599	1792	0	1821	1792	0	1853	1774	1863	1583
Q Serve(g.s), s	2.4	19.0	19.0	0.7	0.0	17.0	13.8	0.0	8.0	5.1	15.7	1.5
Cycle Q Clear(g.c), s	2.4	19.0	19.0	0.7	0.0	17.0	13.8	0.0	8.0	5.1	15.7	1.5
Prop In Lane	1.00	1.00	1.00	1.00	0.19	1.00	0.09	1.00	0.09	1.00	1.00	1.00
Lane Gp Cap(c), veh/h	381	400	632	341	0	347	653	0	338	338	355	302
Avl Ratio(X)	0.15	1.03	1.02	0.05	0.00	1.15	0.87	0.00	0.54	0.35	0.94	0.11
Avl Cap(C,a), veh/h	381	400	632	341	0	347	653	0	338	338	355	302
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(f)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	286	35.1	22.1	29.5	0.0	36.1	35.5	0.0	33.1	31.3	35.6	29.9
Incr Delay (d2), s/veh	0.2	54.0	41.2	0.1	0.0	94.9	11.6	0.0	1.5	0.5	32.2	0.1
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackQ(50%), veh/h	1.2	15.8	22.7	0.3	0.0	17.6	7.9	0.0	4.2	2.6	11.2	0.7
LnGrp Delay(d), s/veh	288	89.2	63.3	29.6	0.0	131.0	47.1	0.0	34.7	31.8	67.8	30.0
LnGrp LOS	C	F	F	C	F	F	D	C	C	C	E	C
Approach Vol, veh/h	1118											
Approach Delay, s/veh	71.0											
Approach LOS	E											
Timer	1	2	3	4	5	6	7	8				
Assigned Pts	2	2	4	4	5	6	8	8				
Pts Duration (G+Y+R), s	24.0	24.0	22.0	22.0	22.0	22.0	21.3	21.3				
Change Period (Y+R), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0				
Max Green Setting (Gmax), s	19.0	19.0	17.0	17.0	17.0	19.0	17.0	17.0				
Max O Clear Time (G+Y+R), s	21.0	21.0	17.7	17.7	19.0	19.0	15.8	15.8				
Green Ext Time (G+Y+R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5				
Intersection Summary												
HCM 2010 Cnt Delay	69.5											
HCM 2010 LOS	E											
Notes												

HCM 2010 TWSC
20: Hoady St & North St

Projected 2022 without improvements
PM Peak Hour

Intersection												
Int Delay, s/veh		1.7										
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	45	330	0	10	455	50	0	2	10	25	1	15
Future Vol, veh/h	45	330	0	10	455	50	0	2	10	25	1	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	1	1	1	1	1	1	0	0	0	0	0	0
Mvmt Flow	52	379	0	11	523	57	0	2	11	29	1	17

Major/Minor	Major1	Major2			Minor1	Minor2		
Conflicting Flow All	580	0	0	379	0	0	1067	1086
Stage 1	-	-	-	-	-	-	483	483
Stage 2	-	-	-	-	-	-	584	603
Critical Hdwy	4.11	-	-	4.11	-	-	7.1	6.5
Critical Hdwy Sig 1	-	-	-	-	-	-	6.1	5.5
Critical Hdwy Sig 2	-	-	-	-	-	-	6.1	5.5
Follow-up Hdwy	2,209	-	-	2,209	-	-	3.5	4
Poi Cap-1 Maneuver	999	-	-	1185	-	-	202	218
Stage 1	-	-	-	-	-	-	569	556
Stage 2	-	-	-	-	-	-	501	492
Platoon blocked, %	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	999	-	-	1185	-	-	183	201
Mov Cap-2 Maneuver	-	-	-	-	-	-	183	201
Stage 1	-	-	-	-	-	-	531	519
Stage 2	-	-	-	-	-	-	477	485

Approach	EB		WB		NB		SB	
HCM Control Delay, s	1.1		0.2		12.7		23.3	
HCM LOS					B		C	
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	483	999	-	-	1185	-	-	244
HCM Lane V/C Ratio	0.029	0.052	-	-	0.01	-	-	0.193
HCM Control Delay (s)	12.7	88	0	-	8.1	0	-	23.3
HCM Lane LOS	B	A	A	-	A	A	-	C
HCM 95th %tile D(veh)	0.1	0.2	-	-	0	-	-	0.7

SimTraffic Performance Report

Projected 2022 without improvements
PM Peak Hour

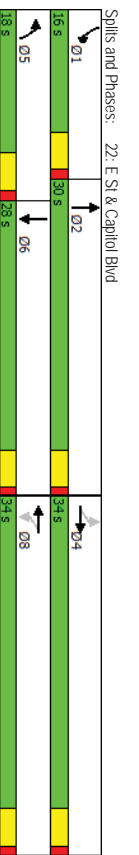
21: I-5 NB Off-Ramp/Deschutes Way & E St Performance by movement

Movement	WBT	WBR	NBT	NBR	SBL	AIL
Denied Del/Veh (s)	0.0	0.0	0.2	0.2	0.3	0.1
Total Del/Veh (s)	1.4	2.3	25.6	6.2	1.6	4.6

Lanes, Volumes, Timings 22: E St & Capitol Blvd

Projected 2022 without improvements
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	120	95	280	135	100	140	235	550	145	205	760	85
Future Volume (vph)	120	95	280	135	100	140	235	550	145	205	760	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0	0	0	0	175	0	150	0	150	0
Storage Lanes	0	0	0	0	0	0	1	0	1	0	1	0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes		Yes	
Link Speed (mph)	30			30			30			30		
Link Distance (ft)	282			479			1902			2019		
Travel Time (s)	6.4			10.9			43.2			45.9		
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Permitted Phases	4	4		8	8		5	2		1	6	
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		5.0	8.0		5.0	8.0	
Minimum Spill (s)	29.5	29.5		29.5	29.5		9.5	26.5		9.5	26.5	
Total Split (s)	34.0	34.0		34.0	34.0		18.0	30.0		16.0	28.0	
Total Split (%)	42.5%	42.5%		42.5%	42.5%		22.5%	37.5%		20.0%	35.0%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5			4.5			4.5	4.5		4.5	4.5	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimizer?							Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Mfn		None	Mfn	



HCM 2010 Signalized Intersection Summary 22: E St & Capitol Blvd

Projected 2022 without improvements
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	120	95	280	135	100	140	235	550	145	205	760	85
Future Volume (veh/h)	120	95	280	135	100	140	235	550	145	205	760	85
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Obs) veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped Bike Adj (Adj)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/hln	1900	1881	1900	1900	1900	1881	1881	1900	1881	1900	1881	1900
Adj Flow Rate, veh/h	140	110	0	157	116	163	273	640	169	238	884	99
Adj No of Lanes	0	1	0	0	1	0	1	2	0	1	2	0
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh. %	1	1	1	0	0	0	1	1	1	1	1	1
Cap. veh/h	265	189	0	233	153	191	314	934	246	278	1016	114
Arrive On Green	0.33	0.33	0.00	0.33	0.33	0.33	0.18	0.33	0.33	0.16	0.31	0.31
Sat Flow, veh/h	577	576	0	507	468	582	1792	2900	738	1792	3241	363
Gp Volume(v), veh/h	250	0	0	436	0	0	273	408	401	238	487	496
Gp Sat Flow(s), veh/hln	1154	0	0	1557	0	0	1792	1787	1751	1792	1787	1817
Q Serve(g), s	0.0	0.0	0.0	5.1	0.0	0.0	10.9	14.5	14.6	9.5	19.0	19.0
Cycle Q Clear(g), s	14.1	0.0	0.0	19.2	0.0	0.0	10.9	14.5	14.6	9.5	19.0	19.0
Prop In Lane	0.56	0.00	0.36	0.00	0.36	0.37	1.00	0.42	1.00	0.42	1.00	0.20
Lane Gp Cap(c), veh/h	454	0	0	577	0	0	314	596	584	278	560	570
Av/C Ratio(X)	0.35	0.00	0.00	0.76	0.00	0.00	0.87	0.68	0.69	0.86	0.87	0.87
Av/C Cap(C-a), veh/h	553	0	0	689	0	0	328	619	606	280	570	580
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(f)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.9	0.0	0.0	23.0	0.0	0.0	29.5	21.2	21.2	30.3	23.9	23.9
Incr Delay (d2), s/veh	1.0	0.0	0.0	4.0	0.0	0.0	20.6	3.0	3.1	21.9	13.5	13.3
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackQ(50%), veh/h	4.5	0.0	0.0	8.9	0.0	0.0	7.2	7.6	7.5	6.4	11.4	11.6
LnGrp Delay(d), s/veh	22.0	0.0	0.0	26.9	0.0	0.0	50.1	24.2	24.3	52.2	37.3	37.2
LnGrp LOS	C			C			D	C	C	D	D	D
Approach Vol, veh/h	250			436			1082			1121		
Approach Delay, s/veh	22.0			26.9			30.8			40.2		
Approach LOS	C			C			C			D		
Timer	1	2	3	4	5	6	7	8				
Assigned Pts	1	2		4	5	6		8				
Pts Duration (G+Y+Rd), s	15.9	29.1		28.6	17.4	27.6		28.6				
Change Period (Y+Rd), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	11.5	25.5		13.5	23.5	29.5		29.5				
Max O Clear Time (G+Y+Rd), s	11.5	16.6		16.1	12.9	21.0		21.2				
Green Ext Time (p.c.), s	0.0	6.6		3.9	0.1	2.1		2.9				

HCM 2010 TWSC
23: Cleveland Ave & South St

Projected 2022 without improvements
PM Peak Hour

Intersection									
Int Delay, s/veh		0.5							
Movement	WBL	WBR	NBT	NBR	SBL	SBT			
Traffic Vol, veh/h	5	15	630	10	20	930			
Future Vol, veh/h	5	15	630	10	20	930			
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	88	88	88	88	88	88			
Heavy Vehicles, %	0	0	1	1	1	1			
Mvmt Flow	6	17	716	11	23	1057			

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1296	364	0	0	727	0
Stage 1	722	-	-	-	-	-
Stage 2	574	-	-	-	-	-
Critical Hdwy	6.8	6.9	-	-	4.12	-
Critical Hdwy Sig 1	5.8	-	-	-	-	-
Critical Hdwy Sig 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.21	-
Pot Cap-1 Maneuver	156	639	-	-	879	-
Stage 1	447	-	-	-	-	-
Stage 2	532	-	-	-	-	-
Platoon blocked, %						
Mov Cap-1 Maneuver	146	639	-	-	879	-
Mov Cap-2 Maneuver	146	-	-	-	-	-
Stage 1	447	-	-	-	-	-
Stage 2	498	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.1	0	0.5
HCM LOS	C		
Minor Lane/Major Mvmt	NBT	NBR/WBL	SBT
Capacity (veh/h)	-	346 879	-
HCM Lane V/C Ratio	-	0.066 0.026	-
HCM Control Delay (s)	-	16.1 9.2	0.3
HCM Lane LOS	-	C A	A
HCM 95th %ile Q(veh)	-	0.2 0.1	-

HCM 2010 TWSC
24: Linwood Ave & 7th Ave

Projected 2022 without improvements
PM Peak Hour

Intersection												
Int Delay, s/veh		4.2										
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SPL	SBT	SBR
Traffic Vol, veh/h	20	140	0	1	285	210	0	0	1	145	0	20
Future Vol, veh/h	20	140	0	1	285	210	0	0	1	145	0	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	3	3	3	1	1	1	0	0	0	1	1	1
Mvmt Flow	22	151	0	1	306	226	0	0	1	156	0	22

Major/Minor	Major1		Major2		Minor1		Minor2	
Conflicting Flow All	532	0	151	0	626	728	151	616
Stage 1	-	-	-	-	194	194	-	422
Stage 2	-	-	-	-	432	534	-	194
Critical Hdwy	4.13	-	4.11	-	7.1	6.5	6.2	7.11
Critical Hdwy Sig 1	-	-	-	-	6.1	5.5	-	6.11
Critical Hdwy Sig 2	-	-	-	-	6.1	5.5	-	6.11
Follow-up Hdwy	2.227	-	2.209	-	3.5	4	3.3	3.509
Pot Cap-1 Maneuver	1030	-	1436	-	400	353	901	404
Stage 1	-	-	-	-	812	744	-	611
Stage 2	-	-	-	-	606	528	-	810
Platoon blocked, %								
Mov Cap-1 Maneuver	1030	-	1436	-	379	345	901	396
Mov Cap-2 Maneuver	-	-	-	-	379	345	-	396
Stage 1	-	-	-	-	793	727	-	597
Stage 2	-	-	-	-	585	527	-	790

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.1	0	9	20
HCM LOS			A	C
Minor Lane/Major Mvmt	NBL	EBL	EBT	EBR
Capacity (veh/h)	901	1030	-	1436
HCM Lane V/C Ratio	0.001	0.021	-	0.001
HCM Control Delay (s)	9	8.6	0	7.5
HCM Lane LOS	A	A	A	A
HCM 95th %ile Q(veh)	0	0.1	-	0

HCM 2010 AWSC
25: Linwood Ave & 2nd Ave

Projected 2022 without improvements
PM Peak Hour

Intersection													
Intersection Delay, s/veh													38.2
Intersection LOS													E
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	
Traffic Vol, veh/h	0	50	155	110	0	135	265	60	0	120	155	90	
Future Vol, veh/h	0	50	155	110	0	135	265	60	0	120	155	90	
Peak Hour Factor	0.92	0.89	0.89	0.92	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	
Heavy Vehicles, %	2	1	1	1	2	1	1	1	2	0	0	0	
Wmnt flow	0	56	174	124	0	152	298	67	0	135	174	101	
Number of Lanes	0	1	1	0	0	1	1	1	0	1	1	0	
Approach													
Opposing Approach	EB						WB						NB
Opposing Lanes	WB						EB						SB
Conflicting Approach Left	2						NB						2
Conflicting Lanes Left	SB						2						EB
Conflicting Approach Right	2						SB						2
Conflicting Lanes Right	NB						2						WB
Conflicting Lanes Right	2						2						2
HCM Control Delay	31.3						43.2						25.8
HCM LOS	D						E						D
Lane													
Vol Left, %	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2					
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%	100%	0%	100%	0%	
Vol Thru, %	0%	63%	0%	58%	0%	82%	0%	57%					
Vol Right, %	0%	37%	0%	42%	0%	18%	0%	43%					
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop					
Traffic Vol by Lane	120	245	50	265	135	325	95	340					
LT Vol	120	0	50	0	135	0	95	0					
Through Vol	0	155	0	155	0	265	0	195					
RT Vol	0	90	0	110	0	60	0	145					
Lane Flow Rate	135	275	56	298	152	365	107	382					
Geometry Grp	7	7	7	7	7	7	7	7					
Degree of Util(X)	0.367	0.688	0.154	0.749	0.402	0.9	0.283	0.925					
Departure Headway (Hd)	9.791	8.999	9.886	9.058	9.531	8.874	9.55	8.717					
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes					
Cap	367	402	362	399	378	409	376	416					
Service Time	7.568	6.775	7.662	6.833	7.305	6.648	7.321	6.487					
HCM Lane V/C Ratio	0.368	0.684	0.155	0.747	0.402	0.892	0.285	0.918					
HCM Control Delay	18.2	29.5	14.5	34.5	18.6	53.4	16.1	57.4					
HCM Lane LOS	C	D	B	D	C	F	C	F					
HCM 95th-ile Q	1.6	5	0.5	6	1.9	9.4	1.1	10.2					

HCM 2010 AWSC
25: Linwood Ave & 2nd Ave

Projected 2022 without improvements
PM Peak Hour

Intersection					
Intersection Delay, s/veh					
Intersection LOS					
Movement					
	SBU	SBL	SBT	SBR	
Traffic Vol, veh/h	0	95	195	145	
Future Vol, veh/h	0	95	195	145	
Peak Hour Factor	0.92	0.89	0.89	0.89	
Heavy Vehicles, %	2	1	1	1	
Wmnt Flow	0	107	219	163	
Number of Lanes	0	1	1	0	
Approach					
	SB				
Opposing Approach	NB				
Opposing Lanes	2				
Conflicting Approach Left	WB				
Conflicting Lanes Left	2				
Conflicting Approach Right	EB				
Conflicting Lanes Right	2				
HCM Control Delay	48.4				
HCM LOS	E				
Lane					

Lanes, Volumes, Timings 26: Capitol Blvd & Linwood Ave

Projected 2022 without improvements
PM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	155	175	165	770	880	280
Future Volume (vph)	155	175	165	770	880	280
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150	0	150	1900	1900	0
Storage Lanes	1	1	1	1	1	0
Taper Length (ft)	25		25			
Right Turn on Red		Yes		30	30	Yes
Link Speed (mph)	30			2664	1902	
Link Distance (ft)	489			60.5	43.2	
Travel Time (s)	11.1	0.84	0.84	0.84	0.84	0.84
Peak Hour Factor	1%	1%	1%	1%	1%	1%
Heavy Vehicles (%)						
Shared Lane Traffic (%)						
Turn Type	Prot	pm+ov	pm+pt	NA	NA	
Protected Phases	4	5	2	6		
Permitted Phases	4	4	2	6		
Detector Phase	4	5	5	2	6	
Switch Phase						
Minimum Initial (s)	5.0	15.0	15.0	15.0	15.0	
Minimum Spill (s)	22.5	19.5	19.5	20.0	21.5	
Total Spill (s)	22.6	19.6	19.6	47.4	27.8	
Total Split (%)	32.3%	28.0%	67.7%	39.7%	3.5	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	
Lead/Lag		Lead		Lag		
Lead-Lag Optimize?		Yes	Yes		Yes	
Recall Mode	None	None	None	Max	Max	

Area Type:	Other
Cycle Length: 70	
Actuated Cycle Length: 62.8	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 26: Capitol Blvd & Linwood Ave

02	04
7.4 s	22.6 s
05	06
19.6 s	27.8 s

HCM 2010 Signalized Intersection Summary 26: Capitol Blvd & Linwood Ave

Projected 2022 without improvements
PM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	155	175	165	770	880	280
Future Volume (veh/h)	155	175	165	770	880	280
Number	7	14	5	2	6	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped Bike Adj(A_pbT)	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/hln	1881	1881	1881	1881	1900	1900
Adj Flow Rate, veh/h	185	208	196	917	1048	333
Adj No of Lanes	1	1	1	2	2	0
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh. %	1	1	1	1	1	1
Cap. veh/h	251	607	549	2540	1063	334
Arrive On Green	0.14	0.14	0.24	0.71	0.40	0.40
Sat Flow, veh/h	1792	1599	1792	3668	2771	843
Gp Volume(V), veh/h	185	208	196	917	696	685
Gp Sat Flow(S), veh/hln	1792	1599	1792	1787	1787	1732
Q Serve(g.s), s	6.0	5.6	2.5	6.0	23.2	23.8
Cycle Q Clear(g.c), s	6.0	5.6	2.5	6.0	23.2	23.8
Prop in Lane	1.00	1.00	1.00		0.49	
Lane Gp Cap(c), veh/h	251	607	549	2540	709	688
V/C Ratio(X)	0.74	0.34	0.36	0.36	0.98	1.00
Avail Cap(C_a), veh/h	537	862	569	2540	709	688
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(f)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	249	13.4	9.3	3.4	18.0	18.1
Incr Delay (d2), s/veh	1.6	0.1	0.1	0.4	29.6	33.3
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackQ(50%),veh/hln	3.0	5.7	1.4	3.1	17.2	17.6
LnGrp Delay(d), s/veh	265	135	9.4	3.8	47.6	51.4
LnGrp LOS	C	B	A	D	D	D
Approach Vol, veh/h	393		1113	1381		
Approach Delay, s/veh	19.6		4.8	49.5		
Approach LOS	B		A	D		
Timer	1	2	3	4	5	6
Assigned PIs						
PIs Duration (G+Y+Rc), s	47.4		13.0	18.9	28.5	
Change Period (Y+Rc), s	4.5		4.5	4.5	4.5	
Max Green Setting (Gmax), s	42.9		18.1	15.1	23.3	
Max Q Clear Time (Q_c+H), s	8.0		8.0	4.5	25.8	
Green Ext Time (P_c), s	20.1		0.5	0.2	0.0	

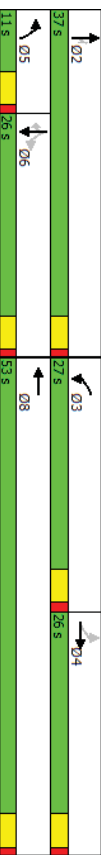
Intersection Summary	
HCM 2010 Cnt Delay	28.2
HCM 2010 LOS	C

Lanes, Volumes, Timings 27: Henderson Blvd & Yelm Hwy

Projected 2022 without improvements
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	10	740	170	460	550	80	120	175	665	180	235	25
Future Volume (vph)	10	740	170	460	550	80	120	175	665	180	235	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200	0	450	0	200	0	100	0	100	0	150	150
Storage Lanes	1	0	1	1	0	1	1	1	1	1	1	1
Taper Length (ft)	25	0	25	0	25	0	25	0	25	0	25	25
Right Turn on Red	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Link Speed (mph)	30	1947	30	1645	30	1645	30	1645	30	1645	30	1645
Link Distance (ft)	44.3	44.3	44.3	37.4	37.4	37.4	37.4	37.4	37.4	37.4	37.4	37.4
Travel Time (s)	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)	Perm	NA	Prot	NA	Prot	NA	Perm	Perm	Perm	NA	Perm	Perm
Turn Type	Protected Phases	4	3	8	5	2	2	6	6	6	6	6
Detector Phase	4	4	3	8	5	2	2	6	6	6	6	6
Switch Phase	Minimum Initial (s)	6.0	6.0	5.0	6.0	5.0	6.0	6.0	6.0	6.0	6.0	6.0
Minimum Spill (s)	24.5	24.5	9.5	24.5	9.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5
Total Spill (s)	26.0	26.0	27.0	53.0	11.0	37.0	37.0	26.0	26.0	26.0	26.0	26.0
Total Split (%)	28.9%	28.9%	30.0%	58.9%	12.2%	41.1%	41.1%	28.9%	28.9%	28.9%	28.9%	28.9%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
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	4.5
Lead/Lag	Lag	Lag	Lead	Yes	Lead	Yes	Lag	Lag	Lag	Lag	Lag	Lag
Lead-Lag Optimizer?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	Max	Max	None	Max	None	None	None	None	None	None	None	None
Area Type:	Other											
Cycle Length:	90											
Actuated Cycle Length:	86.8											
Natural Cycle:	110											
Control Type:	Actuated-Uncoordinated											

Splits and Phases: 27: Henderson Blvd & Yelm Hwy



HCM 2010 Signalized Intersection Summary 27: Henderson Blvd & Yelm Hwy

Projected 2022 without improvements
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (veh/h)	10	740	170	460	550	80	120	175	665	180	235	25
Future Volume (veh/h)	10	740	170	460	550	80	120	175	665	180	235	25
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Q ₀) veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped Bike Adj (Adj _{pb})	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/hln	1881	1881	1900	1881	1881	1881	1881	1881	1881	1881	1881	1881
Adj Flow Rate, veh/h	11	813	187	505	604	88	132	192	0	198	258	27
Adj No of Lanes	1	2	0	1	2	0	1	1	1	1	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh. %	1	1	1	1	1	1	1	1	1	1	1	1
Arrive On Green	273	723	166	469	1769	257	136	622	529	326	381	324
Cap veh/h	0.25	0.25	0.25	0.26	0.56	0.56	0.08	0.33	0.00	0.20	0.20	0.20
Sat Flow veh/h	756	2887	664	1792	3132	455	1792	1881	1599	1198	1881	1599
Gp Volume(v _h) veh/h	11	503	497	505	344	348	132	192	0	198	258	27
Gp Sat Flow(s _h) veh/hln	756	1787	1764	1792	1787	1801	1792	1881	1599	1198	1881	1599
Q Serve(s _h) s	1.0	21.5	21.5	22.5	8.9	9.0	6.3	6.5	0.0	13.6	10.9	1.2
Cycle Q Clear(c _h) s	1.0	21.5	21.5	22.5	8.9	9.0	6.3	6.5	0.0	13.6	10.9	1.2
Prop In Lane	1.00	0.38	1.00	0.25	1.00	0.25	1.00	1.00	1.00	1.00	1.00	1.00
Lane Gp Cap(c _h) veh/h	273	447	442	469	1009	1017	136	622	529	326	381	324
A/C Ratio(X)	0.04	1.13	1.13	1.08	0.34	0.34	0.97	0.31	0.00	0.61	0.66	0.08
Avail Cap(c _h) veh/h	273	447	442	469	1009	1017	136	622	529	326	381	324
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(f _h)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d _h) s/veh	24.5	32.2	32.2	31.7	10.1	10.1	39.6	21.4	0.0	32.7	31.7	27.8
Incrl Delay (d ₂) s/veh	0.3	81.3	81.6	63.5	0.9	0.9	69.0	0.3	0.0	2.0	2.8	0.1
Initial Q Delay(d ₃) s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackQ(50%) veh/h	0.2	20.5	20.3	19.2	4.7	4.7	5.7	3.4	0.0	4.6	6.0	0.5
LnGrp Delay(d _h) s/veh	24.8	113.5	113.8	95.2	11.0	11.0	108.6	21.7	0.0	34.7	34.5	27.9
LnGrp LOS	C	F	F	F	B	B	F	C	C	C	C	C
Approach Vol, veh/h	1011											
Approach Delay, s/veh	112.7											
Approach LOS	F											
Timer	1	2	3	4	5	6	7	8				
Assigned Pts	2	3	4	5	6	8						
Pts Duration (G+Y+R _c) s	32.9	27.0	26.0	11.0	21.9	53.0						
Change Period (Y+R _c) s	4.5	4.5	4.5	4.5	4.5	4.5						
Max Green Setting (G _{max}) s	32.5	21.5	21.5	6.5	21.5	48.5						
Max Q Clear Time (Q _c +t ₁) s	8.5	24.5	23.5	8.3	15.6	11.0						
Green Ext Time (P _c) s	3.6	0.0	0.0	0.0	1.8	15.6						
Intersection Summary												
HCM 2010 Cnt Delay	67.9											
HCM 2010 LOS	E											

HCM 2010 TWSC
28: Trosper Rd & Rural Rd

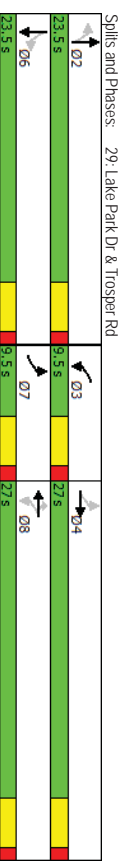
Projected 2022 without improvements
PM Peak Hour

Intersection									
In Delay, s/veh		3.9							
Movement	EBL	EBT	WBT	WBR	SBL	SBR			
Traffic Vol, veh/h	55	205	330	110	95	100			
Future Vol, veh/h	55	205	330	110	95	100			
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			
Vel in Median Storage, #	-	0	0	0	0	-			
Grade, %	-	0	0	0	0	-			
Peak Hour Factor	92	92	92	92	92	92			
Heavy Vehicles, %	0	0	1	1	2	2			
Wmt Flow	60	223	359	120	103	109			
Major/Minor	Major1	Major2		Minor2					
Conflicting Flow All	478	0	-	0	760	418			
Stage 1	-	-	-	-	418	-			
Stage 2	-	-	-	-	342	-			
Critical Hdwy	4.1	-	-	-	6.42	6.22			
Critical Hdwy Sig 1	-	-	-	-	5.42	-			
Critical Hdwy Sig 2	-	-	-	-	5.42	-			
Follow-up Hdwy	2.2	-	-	-	3.518	3.318			
Pot Cap-1 Maneuver	1095	-	-	-	374	635			
Stage 1	-	-	-	-	664	-			
Stage 2	-	-	-	-	719	-			
Platoon blocked, %	-	-	-	-	-	-			
Max Cap-1 Maneuver	1095	-	-	-	350	635			
Max Cap-2 Maneuver	-	-	-	-	350	-			
Stage 1	-	-	-	-	664	-			
Stage 2	-	-	-	-	674	-			
Approach	EB		WB		SB				
HCM Control Delay, s	1.8		0		15.6				
HCM LOS					C				
Minor Lane/Major Wmt	EBL	EBT	WBT	WBR	SBL	SBR			
Capacity (veh/h)	1095	-	-	-	350	635			
HCM Lane V/C Ratio	0.055	-	-	-	0.295	0.171			
HCM Control Delay (s)	85	0	-	-	19.5	11.8			
HCM Lane LOS	A	A	-	-	C	B			
HCM 95th %ile Q(veh)	0.2	-	-	-	1.2	0.6			

Lanes, Volumes, Timings
29: Lake Park Dr & Trosper Rd

Projected 2022 without improvements
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	10	290	45	55	415	75	65	25	60	70	20	15
Future Volume (vph)	10	290	45	55	415	75	65	25	60	70	20	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	125	150	225	1	1	1	1	1	1	1	1	0
Storage Lanes	1	1	1	1	1	1	1	1	1	1	1	0
Taper Length (ft)	25	25	25	25	25	25	25	25	25	25	25	0
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2012			652			269			583	
Travel Time (s)		45.7			14.8			6.1			13.3	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Turn Type	pm+pl	NA	pm+pl	NA	Perm	Perm	NA	Perm	NA	Perm	NA	NA
Protected Phases	7	4	3	8	8	2	2	6	6	6	6	6
Permitted Phases	4	4	3	8	8	2	2	6	6	6	6	6
Detector Phase	7	4	3	8	8	2	2	6	6	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Spill (s)	9.5	26.5	9.5	26.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5
Total Spill (s)	9.5	27.0	9.5	27.0	23.5	23.5	23.5	23.5	23.5	23.5	23.5	23.5
Total Split (%)	15.8%	45.0%	15.8%	45.0%	39.2%	39.2%	39.2%	39.2%	39.2%	39.2%	39.2%	39.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
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	4.5
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lag	Lag	Lag	Lag
Lead-Lag Optimizer?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	None	None	None	None	None
Intersection Summary												
Area Type:	Other											
Cycle Length: 60												
Actuated Cycle Length: 46												
Natural Cycle: 60												
Control Type: Actuated-Uncoordinated												



HCM 2010 Signalized Intersection Summary 29: Lake Park Dr & Trosper Rd

PM Peak Hour

Projected 2022 without improvements

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (veh/h)	10	290	45	55	415	75	65	25	60	70	20	15
Future Volume (vph)	10	290	45	55	415	75	65	25	60	70	20	15
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Q ₀), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped Bike Adj(A _{pb})	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/hln	1881	1881	1900	1881	1881	1881	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	11	305	47	58	437	79	68	26	63	74	21	16
Adj No of Lanes	1	2	0	1	1	1	1	0	1	1	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh. %	1	1	1	1	1	1	0	0	0	0	0	0
Arrive On Green	0.01	0.28	0.28	0.06	0.32	0.32	0.39	0.39	0.39	0.39	0.39	0.39
Sat Flow, veh/h	1792	3110	474	1792	1881	1599	1393	493	1196	1329	1002	763
Grp Volume(V _g), veh/h	11	174	178	58	437	79	68	0	89	74	0	37
Grp Sat Flow(S _g), veh/hln	1792	1787	1792	1792	1881	1599	1393	0	1689	1329	0	1765
Q Serve(g.s), s	0.2	3.8	3.9	1.1	100	1.7	1.6	0.0	1.7	1.9	0.0	0.6
Cycle Q Clear(g.c), s	0.2	3.8	3.9	1.1	100	1.7	2.2	0.0	1.7	3.5	0.0	0.6
Prop In Lane	1.00	0.26	1.00	1.00	1.00	1.00	1.00	0.71	1.00	0.71	0.43	0.43
Lane Grp Cap(c), veh/h	277	503	506	456	607	516	668	0	655	617	0	684
W/C Ratio(X)	0.04	0.35	0.35	0.13	0.72	0.15	0.10	0.00	0.14	0.12	0.00	0.05
Avail Cap(c, a), veh/h	435	820	825	539	863	734	668	0	655	617	0	684
HC Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(f)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	12.9	14.0	14.1	11.3	14.6	11.8	10.1	0.0	9.7	10.9	0.0	9.4
Incr Delay (d ₂), s/veh	0.1	0.4	0.4	0.1	1.7	0.1	0.3	0.0	0.4	0.4	0.0	0.2
Initial Q Delay(d ₀), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackQ(50%), veh/h	0.1	1.9	2.0	0.5	5.4	0.8	0.7	0.0	0.8	0.7	0.0	0.3
LnGrp Delay(d ₀), s/veh	13.0	14.4	14.5	11.4	16.3	12.0	10.4	0.0	10.1	11.2	0.0	9.5
LnGrp LOS	B	B	B	B	B	B	B	B	B	B	B	A
Approach Vol, veh/h	363			574			157			111		
Approach Delay, s/veh	14.4			15.2			10.2			10.7		
Approach LOS	B			B			B			B		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	2	3	4	5	6	7	8					
Phs Duration (G+Y+R ₀), s	23.5	7.2	18.3	4.5	23.5	5.2	20.3					
Change Period (Y+R ₀), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5					
Max Green Setting (G _{max}), s	19.0	5.0	22.5	19.0	5.0	22.5	19.0					
Max Q Clear Time (Q _{clear}), s	4.2	3.1	5.9	5.5	2.2	12.0						
Green Ext Time (Q _{ext}), s	0.9	0.0	4.8	0.9	0.0	3.8						
Intersection Summary												
HCM 2010 Ctrl Delay	13.9											
HCM 2010 LOS	B											

Lanes, Volumes, Timings 30: Littlerock Rd/2nd Ave & Trosper Rd

PM Peak Hour

Projected 2022 without improvements

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	50	315	120	395	325	35	215	265	440	115	300	60
Future Volume (vph)	50	315	120	395	325	35	215	265	440	115	300	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100	0	150	0	250	0	250	0	150	250	0	0
Storage Lanes	1	0	1	1	1	0	1	1	1	2	0	0
Taper Length (ft)	25			25			25			25		
Right Turn on Red	Yes			Yes			Yes			Yes		
Link Speed (mph)	30			30			30			30		
Link Distance (ft)	652			520			896			1861		
Travel Time (s)	14.8			11.8			20.4			42.3		
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)	37%			37%			37%			37%		
Turn Type	Split	NA	Split	NA	NA	Pro	NA	pm+ov	Pro	NA		
Protected Phases	4	4	8	8	8	5	2		8	1	6	
Permitted Phases	4	4	8	8	8	5	2		8	1	6	
Detector Phase	4	4	8	8	8	5	2		8	1	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Spill (s)	35.6	35.6	33.6	33.6	37.0	24.5	30.6	33.6	8.6	31.6		
Total Spill (s)	36.0	36.0	37.0	37.0	29.0	42.0	37.0	20.0	33.0			
Total Split (%)	26.7%	26.7%	27.4%	27.4%	21.5%	31.1%	27.4%	14.8%	24.4%			
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Lead/Lag Optimizer?												
Recall Mode	Max	Max	C-Max	C-Max	C-Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intersection Summary												
Area Type:	Other											
Cycle Length: 135												
Actuated Cycle Length: 135												
Offset: 46 (34%), Referenced to phase 8:WBT.L Start of Red												
Natural Cycle: 130												
Control Type: Actuated-Coordinated												
Spills and Phases: 30: Littlerock Rd/2nd Ave & Trosper Rd												
01	02	03	04	05	06	07	08	09	10	11	12	13
20 s	42 s	36 s	37 s	33 s	33 s	33 s	33 s	33 s	33 s	33 s	33 s	33 s
05	06	07	08	09	10	11	12	13	14	15	16	17

HCM 2010 Signalized Intersection Summary
301 Litterock Rd/2nd Ave & Trospier Rd

Projected 2022 without improvements
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (veh/h)	50	315	120	395	325	35	215	265	440	115	300	60
Future Volume (veh/h)	50	315	120	395	325	35	215	265	440	115	300	60
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Q ₀) veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped Bike Adj(A _{pb})	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/hln	1881	1881	1900	1881	1900	1881	1881	1881	1881	1881	1900	1900
Adj Flow Rate, veh/h	51	321	61	257	536	36	219	270	332	117	306	61
Adj No of Lanes	1	2	0	1	2	0	1	1	1	1	2	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh. %	1	1	1	1	1	1	1	1	1	1	1	1
Cap veh/h	417	699	131	430	837	56	324	587	883	141	627	123
Arrive On Green	0.23	0.23	0.23	0.40	0.40	0.40	0.18	0.31	0.31	0.08	0.21	0.21
Sat Flow, veh/h	1792	3004	564	1792	3487	234	1792	1881	1599	1792	2919	386
Grp Volume(V _g) veh/h	51	189	193	257	289	283	219	270	332	117	182	185
Grp Sat Flow(s) veh/hln	1792	1787	1782	1792	1881	1840	1792	1881	1599	1792	1787	1778
Q Serve(g _s) s	3.0	12.3	12.6	15.3	16.7	16.8	15.4	15.6	15.8	8.7	12.1	12.4
Cycle Q Clear(g _c) s	3.0	12.3	12.6	15.3	16.7	16.8	15.4	15.6	15.8	8.7	12.1	12.4
Prop In Lane	1.00	0.32	1.00	0.13	1.00	0.13	1.00	1.00	1.00	0.08	0.33	0.33
Lane Grp Cap(c _g) veh/h	417	416	414	430	451	442	324	587	883	141	376	374
W/C Ratio(X)	0.12	0.46	0.46	0.60	0.64	0.64	0.46	0.38	0.83	0.48	0.49	0.49
Avail Cap(c _a) veh/h	417	416	414	430	451	442	324	587	883	141	376	374
HCM Platoon Ratio	1.00	1.00	1.00	1.67	1.67	1.67	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(f)	0.97	0.97	0.97	0.83	0.83	0.83	0.87	0.87	0.87	1.00	1.00	1.00
Uniform Delay (d _u) s/veh	409	44.5	44.6	35.3	35.7	35.8	51.6	37.3	17.1	61.3	46.9	47.0
Incr Delay (d ₂) s/veh	0.6	3.5	3.6	5.0	5.6	5.8	9.5	2.2	1.1	16.6	4.4	4.6
Initial Q Delay(d ₀) s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackQ(50%) veh/h	1.6	6.4	6.6	8.1	9.3	9.2	8.5	8.5	11.0	5.0	6.4	6.5
LnGrp Delay(d _g) s/veh	415	47.9	48.2	40.3	41.4	41.6	61.1	39.5	18.1	77.8	51.3	51.6
LnGrp LOS	D	D	D	D	D	D	E	D	B	E	D	D
Approach Vol, veh/h	433	47.3	829	821	484	57.8						
Approach Delay, s/veh	47.3	41.1	36.6	57.8								
Approach LOS	D	D	D	D	E							
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+R ₀) s	15.3	46.7	36.0	29.0	33.0	37.0						
Change Period (Y+R ₀) s	4.6	4.6	4.6	4.6	4.6	4.6						
Max Green Sating (G _{max}) s	15.4	37.4	31.4	24.4	28.4	32.4						
Max Q Clear Time (G _{ch1}) s	10.7	17.8	14.6	17.4	14.4	18.8						
Green Ext Time (G _{ch1}) s	0.1	4.0	1.8	0.3	3.6	3.7						
Intersection Summary												
HCM 2010 Crt Delay			43.9									
HCM 2010 LOS			D									
Notes												

Lanes, Volumes, Timings
311 Tyee Dr/L-5 SB Ramps & Trospier Rd

Projected 2022 without improvements
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (veh/h)	170	640	20	265	340	240	25	190	345	430	330	415
Future Volume (veh/h)	170	640	20	265	340	240	25	190	345	430	330	415
Ideal Flow (veh/h)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200	100	100	275	0	75	125	400	400	400	400	400
Storage Lanes	1	1	1	1	1	1	1	1	1	1	1	1
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30		30		
Link Distance (ft)		520			883			832		932		
Travel Time (s)		11.8			20.1			18.9		21.6		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	2%	2%	2%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	Prot	NA	Perm	Prot	NA	Split	NA	Split	NA	Split	NA	Perm
Protected Phases	7	4	4	3	8	2	2	2.3	6	6	6	6
Permitted Phases	7	4	4	3	8	2	2	2.3	6	6	6	6
Detector Phase	7	4	4	3	8	2	2	2.3	6	6	6	6
Switch Phase												
Minimum Initial (s)	4.0	10.0	10.0	4.0	10.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Spill (s)	8.6	33.6	33.6	8.6	29.6	20.5	20.5	36.6	36.6	36.6	36.6	36.6
Total Spill (s)	25.5	38.0	38.0	32.0	44.5	24.0	24.0	41.0	41.0	41.0	41.0	41.0
Total Spill (%)	18.9%	28.1%	28.1%	23.7%	33.0%	17.8%	17.8%	30.4%	30.4%	30.4%	30.4%	30.4%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimizer?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	Max	Max	Max	Max	Max	Max	Max
Intersection Summary												
Area Type:												
Cycle Length: 135												
Actuated Cycle Length: 135												
Offset: 46 (34%)												
Offset: 46 (34%)												
Natural Cycle: 110												
Control Type: Actuated-Coordinated												
Spills and Phases: 311 Tyee Dr/L-5 SB Ramps & Trospier Rd												
02	06	03	07	04 (R)								
2+5	1+5	3+5	4+5	5+5	6+5	7+5	8+5	9+5	10+5	11+5	12+5	13+5

HCM 2010 Signalized Intersection Summary 31: Tye Dr/I-5 SB Ramps & Trosper Rd

Projected 2022 without improvements
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	←	←	←	←	←	←	←	←	←	←	←	←
Traffic Volume (veh/h)	170	640	20	265	340	240	25	190	345	430	330	415
Future Volume (veh/h)	170	640	20	265	340	240	25	190	345	430	330	415
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Q ₀), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped Bike Adj(A _{pb})	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/hln	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881
Adj Flow Rate, veh/h	179	674	21	279	358	0	26	200	310	453	347	121
Adj No of Lanes	1	2	1	1	2	0	1	1	1	2	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh. %	1	1	1	1	1	1	2	2	2	1	1	1
Cap. veh/h	202	1006	450	303	1206	0	255	268	495	628	507	431
Arrive On Green	0.23	0.56	0.28	0.56	0.00	0.14	0.14	0.14	0.27	0.27	0.27	0.27
Sat Flow, veh/h	1792	3574	1599	1792	3668	0	1774	1863	1583	2329	1881	1599
Grip Volume(V _g), veh/h	179	674	21	279	358	0	26	200	310	453	347	121
Grip Sat Flow(s), veh/hln	1792	1787	1599	1792	1787	0	1774	1863	1583	1165	1881	1599
Q Serve(g.s), s	13.0	17.9	0.8	20.4	7.1	0.0	1.7	13.9	19.4	23.8	22.3	8.1
Cycle Q Clear(g.c), s	13.0	17.9	0.8	20.4	7.1	0.0	1.7	13.9	19.4	23.8	22.3	8.1
Prop In Lane	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Grp Cap(c), veh/h	202	1006	450	303	1206	0	255	268	495	628	507	431
W/C Ratio(X)	0.88	0.67	0.05	0.92	0.30	0.00	0.10	0.75	0.63	0.72	0.68	0.28
Avail Cap(c, a), veh/h	277	1006	450	364	1206	0	255	268	495	628	507	431
HCM Platoon Ratio	2.00	2.00	1.67	1.67	1.67	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(f)	0.84	0.84	0.84	0.82	0.82	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.4	25.1	21.4	47.6	21.1	0.0	50.2	55.4	39.7	44.7	44.2	39.0
Incr Delay (d ₂), s/veh	18.6	3.0	0.2	22.5	0.5	0.0	0.8	17.3	5.9	7.0	7.3	1.6
Initial Q Delay(d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackQ(50%), veh/h	7.5	9.1	0.4	12.0	3.6	0.0	0.9	8.4	10.7	8.3	12.6	3.7
LnGrp Delay(d), s/veh	70.0	28.1	21.5	70.1	21.6	0.0	51.0	72.7	45.5	51.7	51.5	40.6
LnGrp LOS	E	C	C	E	C	D	D	E	D	D	D	D
Approach Vol, veh/h	874			637			536			921		
Approach Sat, veh/h	36.5			42.9			53.9			50.2		
Approach LOS	D			D			E			D		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	2	2	3	4	5	6	7	8				
Phs Duration (G+Y+R ₀), s	24.0	27.4	42.6	41.0	19.9	50.1						
Change Period (Y+R ₀), s	4.6	4.6	4.6	4.6	4.6	4.6						
Max Green Setting (G _{max}), s	19.4	27.4	33.4	36.4	20.9	39.9						
Max Q Clear Time (Q _{ch1}), s	21.4	22.4	19.9	25.8	15.0	9.1						
Green Ext Time (Q _{ch}), s	0.0	0.4	5.6	3.9	0.2	7.8						
Intersection Summary												
HCM 2010 Crt Delay	45.6											
HCM 2010 LOS	D											

Lanes, Volumes, Timings 32: I-5 NB Ramps & Trosper Rd

Projected 2022 without improvements
PM Peak Hour

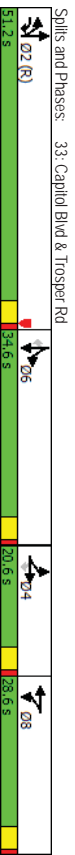
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL2	NBL	NBR	SEL	SER
Lane Configurations	←	←	←	←	←	←	←	←	←	←	←
Traffic Volume (vph)	0	905	545	0	660	615	190	0	85	0	0
Future Volume (vph)	0	905	545	0	660	615	190	0	85	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	300	0	0	0	0	0	200	0	0	0
Storage Lanes	1	1	0	0	0	0	1	1	1	0	0
Taper Length (ft)	25			25				25		25	
Right Turn on Red			Yes			Yes		Yes		Yes	
Link Speed (mph)		30			30		30		30		30
Link Distance (ft)		883			397		785		593		593
Travel Time (s)		20.1			9.0		17.8		13.5		13.5
Peak Hour Factor		0.93	0.93		0.93	0.93	0.93		0.93		0.93
Heavy Vehicles (%)		1%	1%		1%	1%	1%		1%		0%
Shared Lane Traffic (%)											
Turn Type		NA			NA		Prot		Prot		
Protected Phases		4			8		5		5		
Permitted Phases		4			8		5		5		
Detector Phase		4			8		5		5		
Switch Phase											
Minimum Initial (s)		10.0			10.0		6.0		6.0		
Minimum Spill (s)		21.5			21.5		10.6		10.6		
Total Spill (s)		96.0			96.0		39.0		39.0		
Total Split (%)		71.1%			71.1%		28.9%		28.9%		
Yellow Time (s)		3.6			3.6		3.6		3.6		
All-Red Time (s)		1.0			1.0		1.0		1.0		
Lost Time Adjust (s)		0.0			0.0		0.0		0.0		
Total Lost Time (s)		4.6			4.6		4.6		4.6		
Lead-Lag Optimize?											
Recall Mode		C-Max			C-Max		None		None		
Intersection Summary											
Area Type:	Other										
Cycle Length:	135										
Actuated Cycle Length:	135										
Offset:	103 (76%), Referenced to phase 4:EBT and 8:WBT, Start of Red										
Natural Cycle:	40										
Control Type:	Actuated-Coordinated										
Spills and Phases:	32: I-5 NB Ramps & Trosper Rd										

HCM 2010 Signalized Intersection Summary Projected 2022 without improvements 32: I-5 NB Ramps & Trosper Rd PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL2	NBL	NBR	SEL	SFR
Lane Configurations		FFB			FFB				FF		
Traffic Volume (veh/h)	0	905	545	0	660	615	190	0	85	0	0
Future Volume (veh/h)	0	905	545	0	660	615	190	0	85	0	0
Number	7	4	14	3	8	18	5	5	12		
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0		
Ped Bike Adj(A, pb7)	1.00		1.00	1.00		1.00	1.00	1.00	1.00		
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/hln	0	1881	1900	0	1881	1900	1881	1881	1881		
Adj Flow Rate, veh/h	0	973	0	0	710	0	204	204	0		
Adj No of Lanes	0	3	0	0	2	0	1	1	1		
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93		
Percent Heavy Veh. %	0	1	1	0	1	1	1	1	1		
Cap. veh/h	0	4125	0	0	2871	0	230	230	206		
Arrive On Green	0.00	1.00	0.00	0.00	1.00	0.00	0.13	0.13	0.00		
Sat Flow, veh/h	0	5474	0	0	3762	0	1792	1792	1599		
Grp Volume(V), veh/h	0	973	0	0	710	0	204	204	0		
Grp Sat Flow(s), veh/hln	0	1712	0	0	1787	0	1792	1792	1599		
Q Serve(g.s), s	0.0	0.0	0.0	0.0	0.0	0.0	15.1	15.1	0.0		
Cycle Q Clear(g.c), s	0.0	0.0	0.0	0.0	0.0	0.0	15.1	15.1	0.0		
Prop In Lane	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00		
Lane Grp Cap(c), veh/h	0	4125	0	0	2871	0	230	230	206		
W/C Ratio(X)	0.00	0.24	0.00	0.00	0.25	0.00	0.89	0.89	0.00		
Avail Cap(c-a), veh/h	0	4125	0	0	2871	0	457	457	407		
HCM Platoon Ratio	1.00	2.00	2.00	1.00	2.00	2.00	1.00	1.00	1.00		
Upstream Filter(f)	0.00	0.66	0.00	0.00	0.49	0.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	57.8	57.8	0.0		
Incr Delay (d2), s/veh	0.0	0.1	0.0	0.0	0.1	0.0	4.5	4.5	0.0		
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackQ(50%), veh/h	0.0	0.0	0.0	0.0	0.0	0.0	7.8	7.8	0.0		
LnGrp Delay(d), s/veh	0.0	0.1	0.0	0.0	0.1	0.0	62.3	62.3	0.0		
LnGrp LOS	A										
Approach Vol, veh/h	973										
Approach Delay, s/veh	0.1										
Approach LOS	A										
Timer	1	2	3	4	5	6	7	8			
Assigned PIs	2										
Pis Duration (G+V+R), s	22.0										
Change Period (V+R), s	4.6										
Max Green Setting (Gmax), s	34.4										
Max Q Clear Time (q_c+1), s	17.1										
Green Ext Time (p_c), s	0.3										
Intersection Summary											
HCM 2010 Crt Delay	6.8										
HCM 2010 LOS	A										

Lanes, Volumes, Timings Projected 2022 without improvements 33: Capitol Blvd & Trosper Rd PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	325	50	600	30	75	35	795	675	10	15	615	395
Future Volume (vph)	325	50	600	30	75	35	795	675	10	15	615	395
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0	50	0	250	0	100	0	100	200	0
Storage Lanes	1	1	1	1	1	1	1	1	1	1	1	1
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)			30			30			30			30
Link Distance (ft)			397			338			735			2664
Travel Time (s)			9.0			7.7			16.7			60.5
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)	43%						39%					
Turn Type	Split	NA	pm+ov	Split	NA	Split	NA	Split	NA	Split	NA	Perm
Protected Phases	4	4	2	8	8	2	2	2		6	6	6
Permitted Phases	4	4	2	8	8	2	2	2		6	6	6
Detector Phase	4	4	2	8	8	2	2	2		6	6	6
Switch Phase												
Minimum Initial (s)	100	100	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Minimum Spill (s)	206	206	29.6	28.6	28.6	29.6	29.6	29.6	34.6	34.6	34.6	34.6
Total Split (s)	206	206	51.2	28.6	28.6	51.2	51.2	51.2	34.6	34.6	34.6	34.6
Total Split (%)	15.3%	15.3%	37.9%	21.2%	21.2%	37.9%	37.9%	37.9%	25.6%	25.6%	25.6%	25.6%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Lead-Lag Optimizer?												
Recall Mode	None	None	C-Min	None	None	C-Min	C-Min	C-Min	None	None	None	None
Intersection Summary												
Area Type:	Other											
Cycle Length:	135											
Actuated Cycle Length:	135											
Offset: 6 (4%)	Referenced to phase 2 NBTL, Start of Red											
Natural Cycle:	145											
Control Type:	Actuated-Coordinated											



HCM 2010 Signalized Intersection Summary Projected 2022 without improvements 33: Capitol Blvd & Trospier Rd PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	325	50	600	30	75	35	795	675	10	15	615	395
Future Volume (veh/h)	325	50	600	30	75	35	795	675	10	15	615	395
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Q ₀), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped Bike Adj(A _{pb})	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/hln	1881	1881	1881	1900	1900	1881	1881	1881	1900	1881	1881	1881
Adj Flow Rate, veh/h	364	0	379	30	76	35	498	1109	10	15	621	0
Adj No of Lanes	2	0	1	0	1	0	1	2	0	1	2	1
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh. %	1	1	1	0	0	0	1	1	1	1	1	1
Cap. veh/h	425	0	947	139	95	44	849	1764	16	349	696	311
Arrive On Green	0.04	0.00	0.04	0.08	0.08	0.08	0.79	0.79	0.79	0.19	0.19	0.00
Sat Flow, veh/h	3583	0	1599	1810	1232	568	1792	3723	34	1792	3574	1599
Gp Volume(V _g), veh/h	364	0	379	30	0	111	498	560	559	15	621	0
Gp Sat Flow(s), veh/hln	1792	0	1599	1810	0	1800	1792	1881	1875	1792	1792	1599
Q Serve(g.s), s	13.6	0.0	15.4	2.1	0.0	8.2	14.6	16.7	16.7	0.9	22.9	0.0
Cycle Q Clear(g.c), s	13.6	0.0	15.4	2.1	0.0	8.2	14.6	16.7	16.7	0.9	22.9	0.0
Prop In Lane	1.00	1.00	1.00	1.00	0.32	1.00	0.02	1.00	0.02	1.00	1.00	1.00
Lane Grp Cap(c), veh/h	425	0	947	139	0	138	849	891	888	349	696	311
W/C Ratio(X)	0.86	0.00	0.40	0.22	0.00	0.80	0.59	0.63	0.63	0.04	0.89	0.00
Avail Cap(c, a), veh/h	425	0	947	322	0	320	849	891	888	398	794	335
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.67	1.67	1.00	1.00	1.00	1.00
Upstream Filter(f)	0.92	0.00	0.92	1.00	0.00	1.00	0.80	0.80	0.80	0.23	0.23	0.00
Uniform Delay (d), s/veh	63.7	0.0	15.7	58.5	0.0	61.3	9.0	9.2	9.2	44.2	53.0	0.0
Incr Delay (d ₂), s/veh	14.2	0.0	0.1	0.3	0.0	4.0	2.4	2.7	2.7	0.0	2.8	0.0
Initial Q Delay(d ₀), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackQ(50%), veh/h	7.6	0.0	14.2	1.1	0.0	4.2	7.4	8.9	8.9	0.5	11.6	0.0
LnGrp Delay(d), s/veh	77.9	0.0	15.8	58.8	0.0	65.3	11.3	11.9	11.9	44.2	55.8	0.0
LnGrp LOS	E		B	E		E	B	B	B	D	E	
Approach Vol, veh/h	743			141			1617			636		
Approach Delay, s/veh	46.2			63.9			11.7			55.5		
Approach LOS	D			E			B			E		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	2			4		6		8				
Phs Duration (G+Y+R ₀), s	68.5			20.6		30.9		15.0				
Change Period (Y+R ₀), s	4.6			4.6		4.6		4.6				
Max Green Setting (G _{max}), s	46.6			16.0		30.0		24.0				
Max Q Clear Time (Q _c +t1), s	18.7			17.4		24.9		10.2				
Green Ext Time (Q _c), s	6.4			0.0		1.4		0.2				
Intersection Summary												
HCM 2010 Crt Delay				31.1								
HCM 2010 LOS				C								

Lanes, Volumes, Timings Projected 2022 without improvements 34: Capitol Blvd & Lee St PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	300	5	45	15	10	80	25	1110	25	55	940	185
Future Volume (vph)	300	5	45	15	10	80	25	1110	25	55	940	185
Ideal Flow (vph/g)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	125	0	100	250	0	200	0	200	0	0
Storage Lanes	0	0	1	0	1	1	0	1	0	1	0	0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes		Yes		Yes		Yes
Link Speed (mph)	30			30			30			30		Yes
Link Distance (ft)	718			814			621			735		
Travel Time (s)	16.3			18.5			14.1			16.7		
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA	Prot	NA	Prot	NA
Protected Phases	4	4	4	8	8	8	5	2	1	6		
Permitted Phases	4	4	4	8	8	8	5	2	1	6		
Detector Phase	4	4	4	8	8	8	5	2	1	6		
Switch Phase												
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	12.0	6.0	12.0		
Minimum Spill (s)	29.0	29.0	29.0	30.0	30.0	30.0	11.0	25.0	11.0	25.0		
Total Spill (s)	53.0	53.0	53.0	53.0	53.0	53.0	12.0	67.0	15.0	70.0		
Total Split (%)	39.3%	39.3%	39.3%	39.3%	39.3%	39.3%	8.9%	49.6%	11.1%	51.9%		
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6		
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6		
Lead/Lag												
Lead/Lag Optimizer?							Yes	Lag	Yes	Lag		
Recall Mode	None	None	None	None	None	None	None	C-Max	None	C-Max		

Area Type:	Other
Cycle Length: 135	
Actuated Cycle Length: 135	
Offset: 130 (96%), Referenced to phase 2NBT and 6SBT, Start of Red	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Spills and Phases: 34: Capitol Blvd & Lee St	

HCM 2010 Signalized Intersection Summary 35: Litterrock Rd & Fred Meyer/Costco Drwy

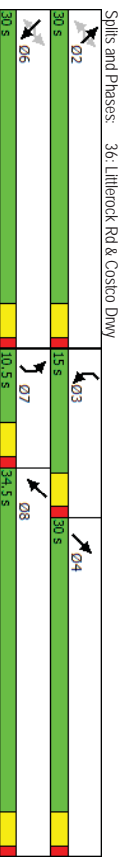
Projected 2022 without improvements
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4	4		4	4		4	4	4	4	4
Traffic Volume (veh/h)	0	0	0	130	5	115	0	770	100	106	680	0
Future Volume (veh/h)	0	0	0	130	5	115	0	770	100	106	680	0
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Q ₀), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped Bike Adj(A _{pb})	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/hln	1900	1900	1900	1881	1881	1881	1881	1900	1881	1881	1900	1900
Adj Flow Rate, veh/h	0	0	0	137	5	121	0	811	105	111	716	0
Adj No of Lanes	0	1	1	0	1	1	1	2	0	1	2	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh. %	0	0	0	1	1	1	1	1	1	1	1	1
Cap. veh/h	0	285	243	400	8	387	5	1378	178	506	2263	0
Arrive On Green	0.00	0.00	0.00	0.15	0.15	0.15	0.00	0.43	0.43	0.09	0.63	0.00
Sat Flow, veh/h	0	1900	1615	1387	51	1599	1792	3183	412	1792	3668	0
Grp Volume(V _g), veh/hln	0	0	142	0	121	0	455	461	111	716	0	0
Grp Sat Flow(S _g), veh/hln	0	1900	1615	1438	0	1599	1792	1787	1808	1792	1787	0
Q Serve(g.s), s	0.0	0.0	0.0	3.4	0.0	2.3	0.0	7.2	7.2	1.0	3.4	0.0
Cycle Q Clear(g.c), s	0.0	0.0	0.0	3.4	0.0	2.3	0.0	7.2	7.2	1.0	3.4	0.0
Prop In Lane	0.00	1.00	0.96	1.00	1.00	1.00	1.00	0.23	1.00	0.00	0.00	0.00
Lane Grp Cap(c), veh/h	0	285	243	407	0	387	5	774	783	506	2263	0
W/C Ratio(X)	0.00	0.00	0.00	0.35	0.00	0.31	0.00	0.59	0.59	0.22	0.32	0.00
Avail Cap(c, a), veh/h	0	823	699	814	0	840	242	774	783	632	2263	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(f)	0.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	14.8	0.0	11.5	0.0	8.0	8.0	4.9	3.1	0.0
Incr Delay (d ₂), s/veh	0.0	0.0	0.0	0.2	0.0	0.2	0.0	3.3	3.2	0.2	0.4	0.0
Initial Q Delay(d ₀), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackQ(50%), veh/hln	0.0	0.0	0.0	1.4	0.0	1.0	0.0	4.1	4.2	0.5	1.7	0.0
Lngrp Delay(d ₀), s/veh	0.0	0.0	0.0	15.0	0.0	11.6	0.0	11.2	11.2	5.0	3.5	0.0
Lngrp LOS				B		B		B	B	A	A	
Approach Vol, veh/h	0			263			916			827		
Approach Delay, s/veh	0.0			13.5			11.2			3.7		
Approach LOS				B			B			A		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+R ₀), s	7.4	20.0		9.6	0.0	27.4		9.6				
Change Period (Y+R ₀), s	4.0	4.0		4.0	4.0	4.0		4.0				
Max Green Setting (G _{max}), s	6.0	16.0		5.0	17.0	16.0		16.0				
Max Q Clear Time (Q _{chl}), s	3.0	9.2		0.0	0.0	5.4		5.4				
Green Ext Time (Q _{cl}), s	0.0	4.6		0.0	0.0	6.8		0.5				
Intersection Summary												
HCM 2010 Crt Delay	8.4											
HCM 2010 LOS	A											

Lanes, Volumes, Timings 36: Litterrock Rd & Costco Drwy

Projected 2022 without improvements
PM Peak Hour

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		4	4		4	4		4	4	4	4	4
Traffic Volume (vph)	80	25	15	130	5	220	50	590	110	220	495	80
Future Volume (vph)	80	25	15	130	5	220	50	590	110	220	495	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	100	0	100	150	0	150	0	150	0	0
Storage Lanes	0	1	1	0	1	1	1	1	1	1	1	0
Taper Length (ft)	25			25						25		
Right Turn on Red		Yes			Yes			Yes			Yes	
Link Speed (mph)	30			30			30			30		
Link Distance (ft)	325			608			995			713		
Travel Time (s)	7.4			13.8			22.6			16.2		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)	Perm	NA	Perm	Perm	NA	Perm	Prot	NA	Prot	NA	NA	NA
Turn Type	Protected	6	6	2	2	2	7	4	4	3	8	8
Permitted Phases	6	6	6	2	2	2	7	4				
Detector Phase	6	6	6	2	2	2	7	4				
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Spill (s)	300	300	300	300	300	300	9.5	300	15.0	34.5	30.0	30.0
Total Spill (s)	300	300	300	300	300	300	10.5	300	15.0	34.5	30.0	30.0
Total Split (%)	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	14.0%	40.0%	20.0%	46.0%	3.0	3.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
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	4.0
Lead/Lag							Lead	Lag	Lead	Lag	Lead	Lag
Lead/Lag Optimizer?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	Max	Max	Max	Max	Max	Max	None	None	None	None	None	None
Intersection Summary												
Area Type:	Other											
Cycle Length:	75											
Actuated Cycle Length:	69.7											
Natural Cycle:	75											
Control Type:	Actuated-Uncoordinated											



HCM Signalized Intersection Capacity Analysis Projected 2022 without improvements

36: Litterock Rd & Costco Drwy

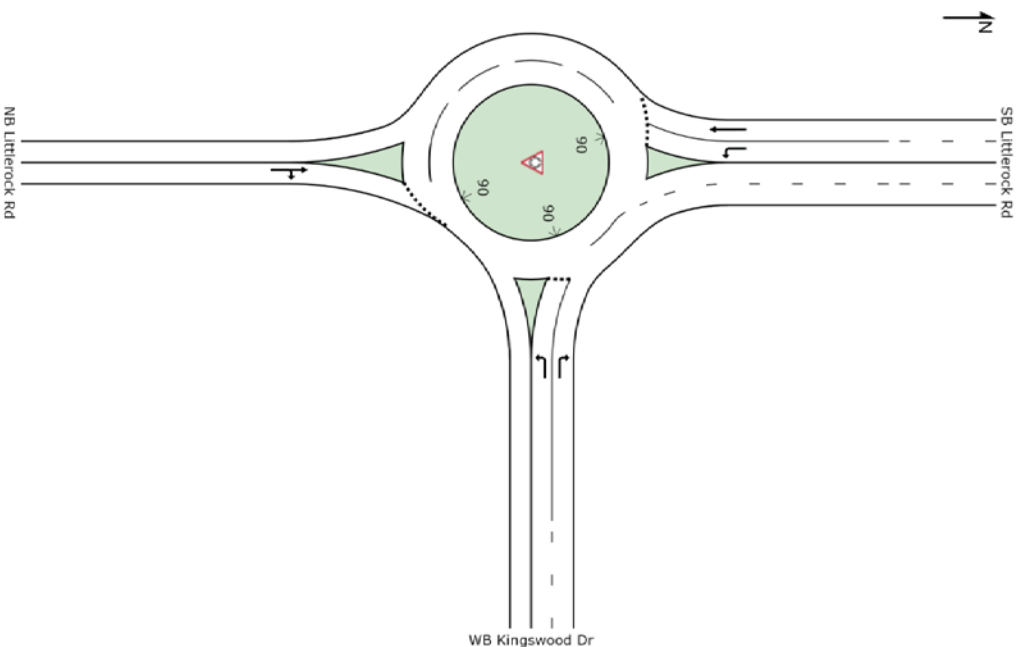
PM Peak Hour

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SMR
Lane Configurations		←	→	←	←	→	→	←	→	←	←	→
Traffic Volume (vph)	80	25	15	130	5	220	50	590	110	220	495	80
Future Volume (vph)	80	25	15	130	5	220	50	590	110	220	495	80
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	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Fit	1.00	0.85	1.00	0.85	1.00	0.85	1.00	0.98	1.00	0.98	1.00	0.98
Fit Protected	0.96	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Satd. Flow (vpo)	1830	1615	1615	1787	3490	1787	3490	1787	3500	1787	3500	1787
Fit Permitted	0.73	1.00	0.67	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Satd. Flow (vpo)	1395	1615	1275	1615	1787	3490	1787	3500	1787	3500	1787	3500
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)	84	26	16	137	5	232	53	621	116	232	521	84
RTOR Reduction (vph)	0	0	10	0	142	85	53	716	0	232	588	0
Lane Group Flow (vph)	0	110	6	0	142	85	53	716	0	232	588	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA	Prot	NA	Prot	NA
Protected Phases	6	6	2	2	7	4	3	8				
Permitted Phases	6	6	2	2	7	4	3	8				
Actuated Green, G (s)	26.1	26.1	26.1	26.1	3.7	22.2	11.0	29.5				
Effective Green, g (s)	26.1	26.1	26.1	26.1	3.7	22.2	11.0	29.5				
Actuated g/C Ratio	0.37	0.37	0.37	0.37	0.05	0.31	0.15	0.41				
Clearance Time (s)	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				
Lane Grp Cap (vph)	510	591	466	591	92	1086	275	1448				
v/s Ratio Prot					0.03	c0.21	c0.13	0.17				
v/s Ratio Perm	0.08	0.00		c0.11	0.05							
v/c Ratio	0.22	0.07	0.30	0.14	0.58	0.66	0.84	0.41				
Uniform Delay, d1	15.6	14.4	16.1	15.1	33.0	21.3	29.3	14.7				
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
Incremental Delay, d2	1.0	0.0	1.7	0.5	8.5	1.5	20.4	0.2				
Delay (s)	16.5	14.4	17.8	15.6	41.5	22.7	49.7	14.9				
Level of Service	B	B	B	B	D	C	D	B				
Approach Delay (s)	16.3			16.5		24.0		24.6				
Approach LOS	B			B		C		C				
Intersection Summary												
HCM 2000 Control Delay	22.4			HCM 2000 Level of Service		C						
HCM 2000 Volume to Capacity ratio	0.54											
Actuated Cycle Length (s)	71.3			Sum of lost time (s)		12.0						
Intersection Capacity Utilization	56.1%			ICU Level of Service		B						
Analysis Period (min)	15											
c Critical Lane Group												

SITE LAYOUT

Site: 37) Litterock Rd at Kingswood Dr

Projected 2022 without improvements
PM Peak Hour
Roundabout



MOVEMENT SUMMARY

Site: 37) Litterlock Rd at Kingswood Dr

Projected 2022 without improvements
PM Peak Hour
Roundabout

Movement Performance - Vehicles									
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg Satn	Average Delay sec	Level of Service	95% Back of Queue Vehicles	Distance Queued ft	Pop. Queued
South: NB Litterlock Rd									
8	T1	666	1.0	0.747	5.2	LOS A	9.0	226.0	0.54
18	R2	151	1.0	0.747	5.1	LOS A	9.0	226.0	0.54
Approach		806	1.0	0.747	5.2	LOS A	9.0	226.0	0.54
East: WB Kingswood Dr									
1	L2	215	1.0	0.254	13.3	LOS B	1.7	43.9	0.76
16	R2	91	1.0	0.055	4.2	LOS A	0.0	0.0	0.00
Approach		306	1.0	0.254	10.6	LOS B	1.7	43.9	0.53
North: SB Litterlock Rd									
7	L2	70	1.0	0.092	11.5	LOS B	0.5	12.2	0.47
4	T1	667	1.0	0.547	5.5	LOS A	4.9	123.5	0.63
Approach		737	1.0	0.547	6.1	LOS A	4.9	123.5	0.61
All Vehicles		1849	1.0	0.747	6.4	LOS A	9.0	226.0	0.57
									0.55
									35.3

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M&D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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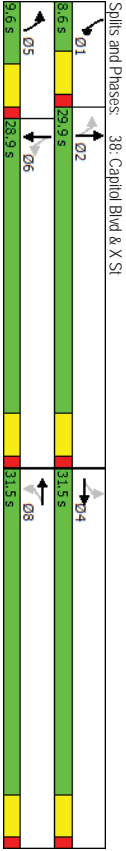
Lanes, Volumes, Timings
38: Capitol Blvd & X St

Projected 2022 without improvements

PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	→	↱	↰	→	↱	↰	→	↱	↰	→	↱
Traffic Volume (vph)	25	1	15	15	1	20	20	9/5	15	35	8/0	40
Future Volume (vph)	25	1	15	15	1	20	20	9/5	15	35	8/0	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100	0	100	0	100	0	150	0	250	0	0	0
Storage Lanes	1	0	1	0	1	0	1	0	1	0	0	0
Taper Length (ft)	25	0	25	0	25	0	25	0	25	0	0	0
Right Turn on Red			Yes		Yes		Yes		Yes		Yes	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		642			1326			1300			1366	
Travel Time (s)		14.6			30.1			29.5			31.1	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	Perm	NA	Perm	NA	pm+pl	NA	pm+pl	NA	pm+pl	NA	pm+pl	NA
Protected Phases	4	4	8	8	5	2	6	1	6	1	6	1
Permitted Phases	4	4	8	8	5	2	6	1	6	1	6	1
Detector Phase	4	4	8	8	5	2	6	1	6	1	6	1
Switch Phase												
Minimum Initial (s)	6.0	6.0	6.0	6.0	4.0	7.0	4.0	7.0	4.0	7.0	4.0	7.0
Minimum Split (s)	31.5	31.5	31.5	31.5	9.5	25.5	8.5	26.5	8.5	26.5	8.5	26.5
Total Split (s)	31.5	31.5	31.5	31.5	9.6	29.9	8.6	28.9	8.6	28.9	8.6	28.9
Total Split (%)	45.0%	45.0%	45.0%	45.0%	13.7%	42.7%	12.3%	41.3%	12.3%	41.3%	12.3%	41.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
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	4.5
Lead/Lag					Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimizer?					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	None	Max	None	Max	None	Max

Intersection Summary		Other
Area Type:		
Cycle Length: 70		
Actuated Cycle Length: 46.3		
Natural Cycle: 70		
Control Type: Actuated-Uncoordinated		



HCM 2010 Signalized Intersection Summary 38. Capitol Blvd & X St

Projected 2022 without improvements
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (veh/h)	25	1	15	15	1	20	20	975	15	35	840	40
Future Volume (veh/h)	25	1	15	15	1	20	20	975	15	35	840	40
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped Bike Adj(A, pb7)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/hln	1900	1900	1900	1900	1900	1881	1881	1900	1881	1881	1900	1900
Adj Flow Rate, veh/h	28	1	17	17	1	22	22	1096	17	39	944	45
Adj No of Lanes	1	1	1	1	1	1	1	2	0	1	2	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh. %	0	0	0	0	0	0	1	1	1	1	1	1
Cap. veh/h	269	8	136	273	6	137	448	2063	32	421	2035	97
Arrive On Green	0.09	0.09	0.09	0.09	0.09	0.09	0.02	0.57	0.57	0.03	0.59	0.59
Sat Flow, veh/h	1410	90	1538	1417	71	1555	1792	3603	56	1792	3474	166
Grp Volume(V), veh/h	28	0	18	17	0	23	22	544	569	39	486	503
Grp Sat Flow(s), veh/hln	1410	0	1629	1417	0	1626	1792	1787	1871	1792	1787	1882
Q Serve(g.s), s	0.8	0.0	0.5	0.5	0.0	0.6	0.2	8.3	8.3	0.4	6.9	6.9
Cycle Q Clear(g.c), s	1.4	0.0	0.5	0.9	0.0	0.6	0.2	8.3	8.3	0.4	6.9	6.9
Prop In Lane	1.00	0.94	1.00	0.96	1.00	0.96	1.00	0.03	1.00	0.03	0.09	0.09
Lane Cap Cap(c), veh/h	269	0	144	273	0	144	448	1024	1072	421	1047	1085
V/C Ratio(X)	0.10	0.00	0.13	0.06	0.00	0.16	0.05	0.53	0.53	0.09	0.46	0.46
Avail Cap(c, a), veh/h	1003	0	992	1011	0	990	615	1024	1072	525	1047	1085
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(f)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.3	0.0	18.6	19.1	0.0	18.7	4.2	5.8	5.8	4.3	5.2	5.2
Incr Delay (d2), s/veh	0.2	0.0	0.4	0.1	0.0	0.5	0.0	2.0	1.9	0.1	1.5	1.4
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOf(50%), veh/h	0.3	0.0	0.2	0.2	0.0	0.3	0.1	4.5	4.7	0.2	3.7	3.8
LnGrp Delay(d), s/veh	19.5	0.0	19.0	19.2	0.0	19.2	4.2	7.8	7.7	4.4	6.7	6.7
LnGrp LOS	B	B	B	B	B	B	A	A	A	A	A	A
Approach Vol, veh/h	46			40			1135			1028		
Approach Delay, s/veh	19.3			19.2			7.7			6.6		
Approach LOS	B			B			A			A		
Timer	1	2	3	4	5	6	7	8				
Assigned Pks	1	2		4	5	6		8				
Pks Duration (G+V+R), s	6.0	29.9		8.4	5.4	30.5		8.4				
Change Period (V+R), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	4.1	25.4		27.0	5.1	24.4		27.0				
Max Q Clear Time (G+Ch1), s	2.4	10.3		3.4	2.2	8.9		2.9				
Green Ext Time (p.c.), s	0.0	11.2		0.3	0.0	11.5		0.3				
Intersection Summary												
HCM 2010 Cnt Delay	7.6											
HCM 2010 LOS	A											

HCM 2010 TWSC 39. Elm St & X St

Projected 2022 without improvements
PM Peak Hour

Intersection	2.3											
Int Delay, s/veh												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	5	10	10	5	5	2	2	65	5	0	45	5
Future Vol, veh/h	5	10	10	5	5	2	2	65	5	0	45	5
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, %	-	-	-	-	-	-	-	-	-	-	-	-
Peak Hour Factor	74	74	74	74	74	74	74	74	74	74	74	74
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	2	2
Mmnt Flow	7	14	14	7	7	3	3	88	7	0	61	7

Major/Minor	Minor2	Minor1	Major1	Major2
Conflicting Flow All	165	164	64	175
Stage 1	64	64	97	97
Stage 2	101	100	78	68
Critical Hdwy	7.1	6.5	6.2	7.1
Critical Hdwy Stg 1	6.1	5.5	-	6.1
Critical Hdwy Stg 2	6.1	5.5	-	6.1
Follow-up Hdwy	3.5	4	3.3	3.5
Pot Cap-1 Maneuver	804	732	1006	792
Stage 1	952	846	-	914
Platoon blocked, %	910	816	-	936
Mov Cap-1 Maneuver	795	731	1006	769
Mov Cap-2 Maneuver	795	731	-	769
Stage 1	950	846	-	912
Stage 2	898	814	-	909
Approach	EB	WB	NB	SB
HCM Control Delay, s	9.5	9.7	0.2	0
HCM LOS	A	A		
Minor Lane/Minor Mmnt	NBL	NBT	NBR	EBL
Capacity (veh/h)	1546	-	836	779
HCM Lane V/C Ratio	0.002	-	0.04	0.021
HCM Control Delay (s)	7.3	0	9.5	9.7
HCM Lane LOS	A	A	A	A
HCM 95th %ile Q (veh)	0	-	0.1	0.1

Lanes, Volumes, Timings 40: Capitol Blvd & Dennis St

Projected 2022 without improvements

PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	170	40	35	30	20	75	15	740	25	50	695	90
Future Volume (vph)	170	40	35	30	20	75	15	740	25	50	695	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	125	0	100	175	0	225	0	225	0	0
Storage Lanes	0	0	1	0	1	1	1	0	1	1	0	0
Taper Length (ft)	25			25			25				25	
Right Turn on Red												
Link Speed (mph)	30		Yes		30		Yes		30		Yes	
Link Distance (ft)	834				700				1337			1300
Travel Time (s)	19.0				15.9				30.4			29.5
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pl	NA	pm+pl	NA	pm+pl	NA
Permitted Phases	4	4	8	8	8	8	5	2	1	6	6	6
Detector Phase	4	4	4	8	8	8	5	2	1	6	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	5.0	8.0	7.0	8.0	7.0	8.0
Minimum Spill (s)	33.5	33.5	33.5	33.5	33.5	33.5	9.5	27.5	11.5	27.5	11.5	27.5
Total Spill (s)	34.0	34.0	34.0	34.0	34.0	34.0	9.5	29.4	11.6	31.5	11.6	31.5
Total Split (%)	45.3%	45.3%	45.3%	45.3%	45.3%	45.3%	12.7%	39.2%	15.5%	42.0%	15.5%	42.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Allied Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
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	4.5
Lead/Lag							Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Max	None	Max	None	Max
Intersection Summary												
Area Type:	Other											
Cycle Length: 75												
Actuated Cycle Length: 59.3												
Natural Cycle: 75												
Control Type: Actuated-Uncoordinated												



HCM Signalized Intersection Capacity Analysis 40: Capitol Blvd & Dennis St

Projected 2022 without improvements

PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	170	40	35	30	20	75	15	740	25	50	695	90
Future Volume (vph)	170	40	35	30	20	75	15	740	25	50	695	90
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	4.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00	0.95
Fit	1.00	0.85	1.00	1.00	0.85	1.00	1.00	1.00	0.95	1.00	0.95	1.00
Fit Protected	0.96	1.00	0.97	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Satd Flow (vph)	1808	1599	1845	1615	1767	3557	1787	3513	1787	3513	1787	3513
Fit Permitted	0.73	1.00	0.76	1.00	0.76	1.00	0.73	1.00	0.76	1.00	0.73	1.00
Satd Flow (vphpl)	1312	1599	1453	1615	1568	3557	1453	1615	1568	3557	1453	1615
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)	187	44	38	33	22	82	16	813	27	55	764	99
RTOR Reduction (vph)	0	0	29	0	0	62	0	3	0	0	10	0
Lane Group Flow (vph)	0	231	9	0	55	20	16	837	0	55	853	0
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pl	NA	pm+pl	NA	pm+pl	NA
Permitted Phases	4	4	8	8	8	5	2	1	6	6	6	6
Actuated Green, G (s)	15.0	15.0	15.0	15.0	15.0	15.0	31.3	30.4	37.3	33.4	37.3	33.4
Effective Green, g (s)	15.0	15.0	15.0	15.0	15.0	15.0	31.3	30.4	37.3	33.4	37.3	33.4
Actuated g/C Ratio	0.24	0.24	0.24	0.24	0.24	0.24	0.50	0.48	0.59	0.53	0.59	0.53
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	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	3.0
Lane Grp Cap (vph)	327	381	347	385	300	1721	356	1868	356	1868	356	1868
W/S Ratio Prot	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
W/S Ratio Perm	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
W/C Ratio	0.71	0.02	0.16	0.05	0.05	0.05	0.49	0.15	0.46	0.15	0.46	0.15
Uniform Delay, d1	21.9	18.3	18.9	18.4	8.0	10.9	6.1	9.1	6.1	9.1	6.1	9.1
Progression Factor	1.00	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	6.8	0.0	0.2	0.1	0.1	0.1	1.0	0.2	0.8	0.2	0.8	0.2
Delay (s)	28.7	18.3	19.1	18.5	8.1	11.9	6.3	9.9	6.3	9.9	6.3	9.9
Level of Service	C	B	B	B	A	B	A	B	A	B	A	B
Approach Delay (s)	27.2						11.8				9.7	
Approach LOS	C						B				A	
Intersection Summary												
HCM 2000 Control Delay	13.3											
HCM 2000 Volume to Capacity ratio	0.53											
Actuated Cycle Length (s)	62.8											
Intersection Capacity Utilization	56.5%											
Analysis Period (min)	15											
C Critical Lane Group												

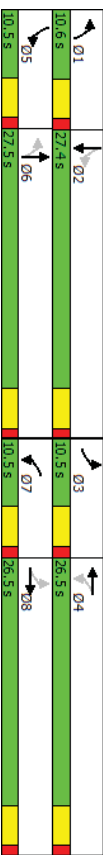
Lanes, Volumes, Timings 41: Israel Rd & Capitol Blvd

Projected 2022 without improvements

PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	95	160	150	105	215	150	120	335	25	120	575	105
Future Volume (vph)	95	160	150	105	215	150	120	335	25	120	575	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0	150	0	150	0	150	0	100	0	0
Storage Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Taper Length (ft)	25	25	25	25	25	25	25	25	25	25	25	25
Right Turn on Red	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Link Speed (mph)	30	30	30	30	30	30	30	30	30	30	30	30
Link Distance (ft)	2751	2751	2751	725	725	725	934	934	934	1337	1337	1337
Travel Time (s)	62.5	62.5	62.5	16.5	16.5	16.5	21.2	21.2	21.2	30.4	30.4	30.4
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 (%)	0%	0%	0%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)	pm+pl	pm+pl	pm+pl	pm+pl	pm+pl	pm+pl	pm+pl	pm+pl	pm+pl	pm+pl	pm+pl	pm+pl
Turn Type	3	8	8	7	4	4	1	6	2	5	2	2
Protected Phases	8	8	8	4	4	4	1	6	2	5	2	2
Permitted Phases	3	8	8	7	4	4	1	6	2	5	2	2
Detector Phase	3	8	8	7	4	4	1	6	2	5	2	2
Switch Phase	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Minimum Initial (s)	10.5	26.5	10.5	26.5	10.5	26.5	10.5	26.5	10.5	26.5	10.5	26.5
Minimum Spill (s)	10.5	26.5	10.5	26.5	10.5	26.5	10.5	26.5	10.5	26.5	10.5	26.5
Total Split (s)	14.0%	35.3%	14.0%	35.3%	14.1%	36.7%	14.0%	36.5%	14.0%	36.5%	14.0%	36.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
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	4.5
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimizer?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	None	None	None	None	None
Area Type:	Other	Other	Other	Other	Other	Other	Other	Other	Other	Other	Other	Other
Cycle Length: 75												
Actuated Cycle Length: 67.5												
Natural Cycle: 75												
Control Type: Actuated-Uncoordinated												

Splits and Phases: 41: Israel Rd & Capitol Blvd



HCM 2010 Signalized Intersection Summary 41: Israel Rd & Capitol Blvd

Projected 2022 without improvements

PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (veh/h)	95	160	150	105	215	150	120	335	25	120	575	105
Future Volume (veh/h)	95	160	150	105	215	150	120	335	25	120	575	105
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Ob) veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped Bike Adj (Adj)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/hln	1900	1900	1900	1863	1863	1863	1881	1881	1881	1881	1881	1900
Adj Flow Rate, veh/h	106	178	100	117	239	167	133	372	28	133	639	117
Adj No of Lanes	1	1	0	1	1	0	1	2	0	1	2	0
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
Percent Heavy Veh. %	0	0	0	2	2	2	1	1	1	1	1	1
Cap. veh/h	288	313	176	388	281	197	339	1084	81	475	971	177
Arrive On Green	0.07	0.27	0.27	0.08	0.28	0.28	0.08	0.32	0.32	0.08	0.32	0.32
Sat Flow veh/h	1810	1144	643	1774	1022	714	1792	3371	253	1792	3019	552
Gp Volume(v), veh/hln	106	0	278	117	0	406	133	196	204	133	378	378
Gp Sat Flow(s), veh/hln	1810	0	1787	1774	0	1737	1732	1787	1837	1792	1787	1784
Q Serve(g), s	2.9	0.0	9.6	3.3	0.0	15.8	3.4	6.0	6.0	3.4	13.0	13.1
Cycle Q Clear(g), s	2.9	0.0	9.6	3.3	0.0	15.8	3.4	6.0	6.0	3.4	13.0	13.1
Prop In Lane	1.00	0.36	1.00	0.41	1.00	0.41	1.00	0.14	1.00	0.14	1.00	0.31
Lane Gp Cap(c), veh/h	288	0	488	388	0	478	339	575	591	475	575	574
Aval Ratio(X)	0.37	0.00	0.57	0.30	0.00	0.85	0.39	0.34	0.34	0.28	0.66	0.66
Avail Cap(C-a), veh/h	306	0	550	402	0	534	353	575	591	486	575	574
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(f)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.1	0.0	22.4	17.0	0.0	24.5	15.4	18.5	18.5	14.2	20.9	20.9
Incr Delay (d2), s/veh	0.9	0.0	1.3	0.5	0.0	11.7	0.9	1.6	1.6	0.4	5.8	5.8
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackQ(50%), veh/hln	1.5	0.0	4.9	1.6	0.0	9.1	1.7	3.2	3.3	1.7	7.3	7.3
LnGrp Delay(d), s/veh	19.1	0.0	23.7	17.5	0.0	36.2	16.3	20.1	20.1	14.6	26.7	26.7
LnGrp LOS	B		C	B		D	B	C	C	B	C	C
Approach Vol, veh/h	384			523			533			889		
Approach Delay, s/veh	22.4			32.0			19.2			24.9		
Approach LOS	C			C			B			C		
Timer	1	2	3	4	5	6	7	8				
Assigned Pts	1	2	3	4	5	6	7	8				
Pts Duration (G+Y+R), s	10.1	27.5	9.8	24.2	10.1	27.5	9.9	24.0				
Change Period (Y+R), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	6.1	22.9	6.0	22.0	6.0	23.0	6.0	22.0				
Max Q Clear Time (g-c+1), s	5.4	15.1	4.9	17.8	5.4	8.0	5.3	11.6				
Green Ext Time (g-c), s	0.0	4.7	0.0	1.9	0.0	7.4	0.0	3.7				
Intersection Summary												
HCM 2010 Cnt Delay	24.8											
HCM 2010 LOS	C											

HCM 2010 TWSC
42. 66th Ave & Black Lake Belmore Rd

Projected 2022 without improvements
PM Peak Hour

Intersection							
Int Delay, s/veh		4.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Traffic Vol, veh/h	55	85	100	135	85	85	
Future Vol, veh/h	55	85	100	135	85	85	
Conflicting Peds, #/hr	0	0	0	0	0	0	
Sign Control	Free	Free	Free	Free	Stop	Stop	
RT Channelized	-	None	-	None	-	None	
Storage Length	-	-	-	-	0	-	
Vel in Median Storage, #	-	0	0	-	0	-	
Grade, %	-	0	0	-	0	-	
Peak Hour Factor	95	95	95	95	95	95	
Heavy Vehicles, %	1	1	1	1	0	0	
Mvmt Flow	58	89	105	142	89	89	

Major/Minor	Major1	Major2	Minor2						
Conflicting Flow All	247	0	0	381	176				
Stage 1	-	-	-	176	-				
Stage 2	-	-	-	205	-				
Critical Hdwy	4.11	-	-	6.4	6.2				
Critical Hdwy Sig 1	-	-	-	5.4	-				
Critical Hdwy Sig 2	-	-	-	5.4	-				
Follow-up Hdwy	2.209	-	-	3.5	3.3				
Pot Cap-1 Maneuver	1325	-	-	625	872				
Stage 1	-	-	-	859	-				
Stage 2	-	-	-	834	-				
Platoon blocked, %	-	-	-	-	-				
Mov Cap-1 Maneuver	1325	-	-	596	872				
Mov Cap-2 Maneuver	-	-	-	596	-				
Stage 1	-	-	-	859	-				
Stage 2	-	-	-	796	-				

Approach	EB	WB	SB						
HCM Control Delay, s	3.1	0	11.8						
HCM LOS	B	B	B						
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBL	SBR			
Capacity (veh/h)	1325	-	-	-	708	-			
HCM Lane V/C Ratio	0.044	-	-	-	0.253	-			
HCM Control Delay (s)	7.8	0	-	-	11.8	-			
HCM Lane LOS	A	A	-	-	B	-			
HCM 95th %ile Q(veh)	0.1	-	-	-	1	-			

HCM 2010 TWSC
43. Kirsop Rd & 66th Ave

Projected 2022 without improvements
PM Peak Hour

Intersection												
Int Delay, s/veh		8.2										
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SPL	SBT	SBR
Traffic Vol, veh/h	25	5	145	5	1	5	240	15	5	5	10	40
Future Vol, veh/h	25	5	145	5	1	5	240	15	5	5	10	40
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	-	-	-	-	-	-	-	-	-	-	-	-
Vel in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	84	84	84	84	84	84	84	84	84	84	84	84
Heavy Vehicles, %	1	1	1	0	0	0	1	1	1	0	0	0
Mvmt Flow	30	6	173	6	1	6	286	18	6	6	12	48

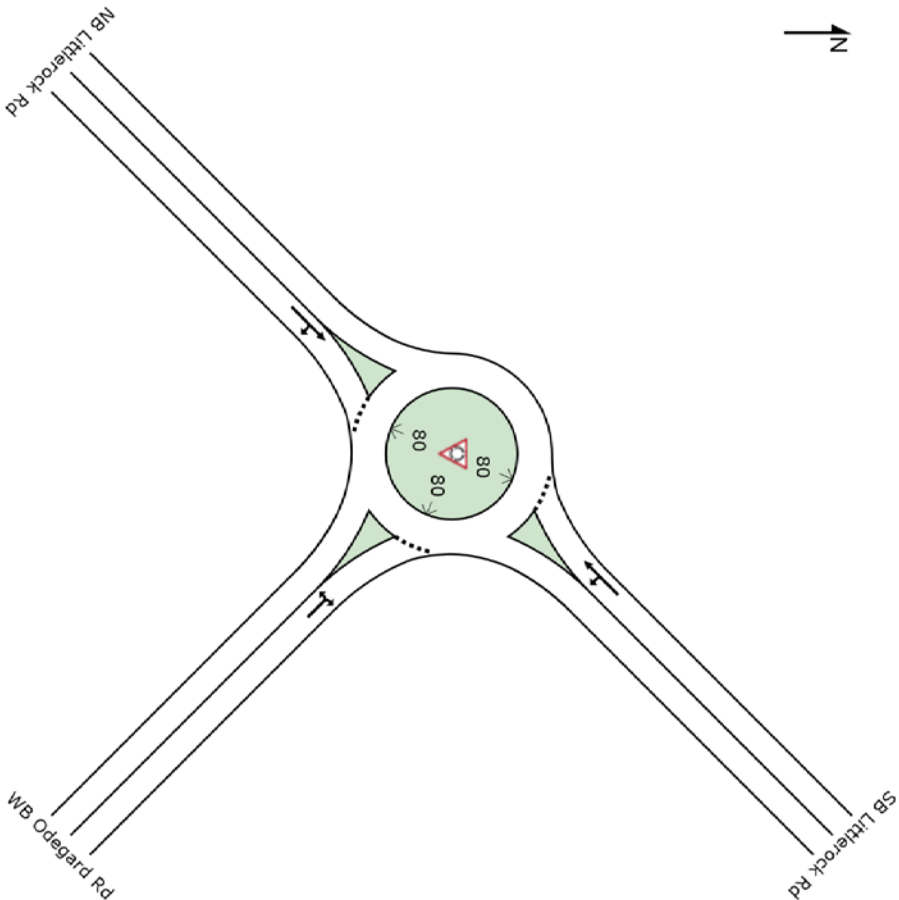
Major/Minor	Minor2	Minor1	Major1	Major2					
Conflicting Flow All	644	643	36	729	663	21	60	0	0
Stage 1	48	48	-	592	592	-	-	-	-
Stage 2	596	595	-	137	71	-	-	-	-
Critical Hdwy	7.11	6.51	6.21	7.1	6.5	6.2	4.11	-	-
Critical Hdwy Sig 1	6.11	5.51	-	6.1	5.5	-	-	-	-
Critical Hdwy Sig 2	6.11	5.51	-	6.1	5.5	-	-	-	-
Follow-up Hdwy	3.509	4.009	3.309	3.5	4	3.3	2.209	-	-
Pot Cap-1 Maneuver	387	393	1039	341	384	1062	1550	-	-
Stage 1	968	857	-	496	497	-	-	-	-
Stage 2	492	494	-	871	840	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	328	318	1039	239	311	1062	1550	-	-
Mov Cap-2 Maneuver	328	318	-	239	311	-	-	-	-
Stage 1	787	854	-	403	404	-	-	-	-
Stage 2	397	402	-	718	837	-	-	-	-

Approach	EB	WB	NB	SB					
HCM Control Delay, s	11.6	14.8	7.2	0.7					
HCM LOS	B	B	B	B					
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBL	EBT	WBL	SBL	SBT	SBR
Capacity (veh/h)	1550	-	-	756	381	1604	-	-	-
HCM Lane V/C Ratio	0.184	-	-	0.276	0.034	0.004	-	-	-
HCM Control Delay (s)	7.8	0	-	11.6	14.8	7.3	0	-	-
HCM Lane LOS	A	A	-	B	B	A	A	-	-
HCM 95th %ile Q(veh)	0.7	-	-	1.1	0.1	0	-	-	-

SITE LAYOUT

Site: 44) Litterrock Rd at Odegard Rd

Projected 2022 without improvements
PM Peak Hour
Roundabout



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MOVEMENT SUMMARY

Site: 44) Litterrock Rd at Odegard Rd

Projected 2022 without improvements
PM Peak Hour
Roundabout

Movement Performance - Vehicles										
Mov ID	OD Mov	Demand Flows Total HV veh/h	HV %	Deg. of Satm v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance ft	Prop. Queued	Effective Stop Rate per veh
SouthEast: WB Odegard Rd										
3x	L2	16	0.0	0.034	14.9	LOS B	0.2	4.6	0.70	0.73
18x	R2	5	0.0	0.034	9.5	LOS A	0.2	4.6	0.70	0.73
Approach		22	0.0	0.034	13.5	LOS B	0.2	4.6	0.70	0.73
NorthEast: SB Litterrock Rd										
1x	L2	11	1.0	0.677	9.7	LOS A	9.6	242.9	0.26	0.38
6x	T1	823	1.0	0.677	4.4	LOS A	9.6	242.9	0.26	0.38
Approach		833	1.0	0.677	4.5	LOS A	9.6	242.9	0.26	0.38
SouthWest: NB Litterrock Rd										
2x	T1	790	1.0	0.641	4.3	LOS A	7.5	189.4	0.17	0.38
12x	R2	5	1.0	0.641	4.2	LOS A	7.5	189.4	0.17	0.38
Approach		796	1.0	0.641	4.3	LOS A	7.5	189.4	0.17	0.38
All Vehicles		1651	1.0	0.677	4.5	LOS A	9.6	242.9	0.22	0.39

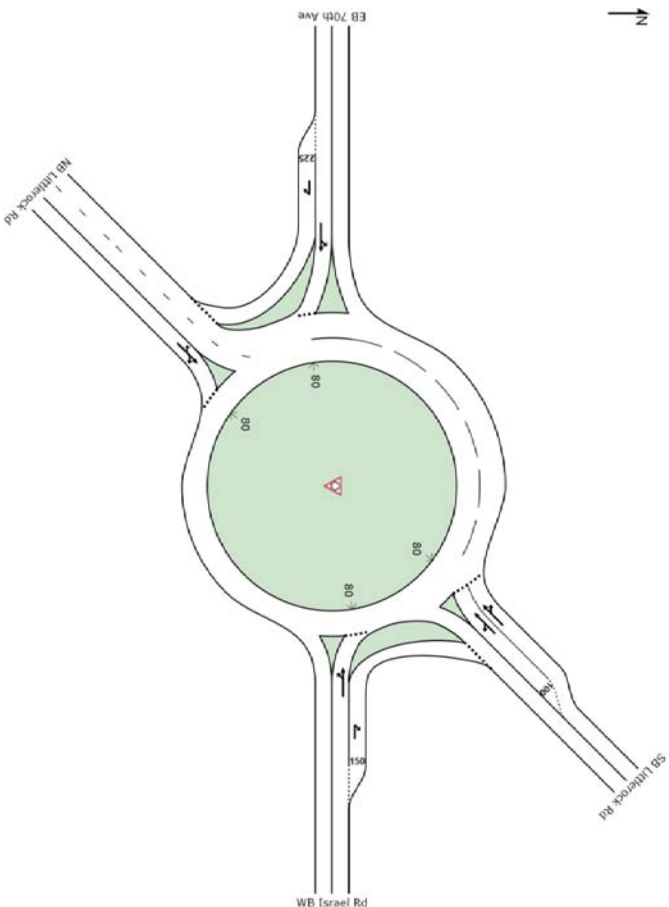
Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akcekl M2D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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SITE LAYOUT

Site: 45) Littlerock Rd at Israel Rd

Projected 2022 without improvements
PM Peak Hour
Roundabout



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MOVEMENT SUMMARY

Site: 45) Littlerock Rd at Israel Rd

Projected 2022 without improvements
PM Peak Hour
Roundabout

Movement Performance - Vehicles										
Mov ID	OD Mov	Demand Flows Total HV veh/h	%	Deg. Satm v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles	Distance Queued ft	Prop. Queued	Effective Stop Rate per veh
East: WB Israel Rd										
1a	L1	137	1.0	0.426	13.0	LOS B	3.3	84.3	0.88	0.87
6	T1	184	1.0	0.426	8.8	LOS A	3.3	84.3	0.88	0.87
16b	R3	337	1.0	0.336	6.6	LOS A	2.3	58.8	0.67	0.71
Approach		656	1.0	0.426	8.5	LOS A	3.3	84.3	0.77	0.79
NorthEast: SB Littlerock Rd										
1bx	L3	184	1.0	0.493	16.1	LOS B	3.9	96.7	0.82	0.90
6x	T1	505	1.0	0.493	9.3	LOS A	4.0	101.8	0.82	0.86
16ax	R1	132	1.0	0.493	8.4	LOS A	4.0	101.8	0.82	0.83
Approach		821	1.0	0.493	10.7	LOS B	4.0	101.8	0.82	0.87
West: EB 70th Ave										
5a	L1	116	1.0	0.283	11.2	LOS B	1.4	35.1	0.68	0.80
2	T1	95	1.0	0.283	7.2	LOS A	1.4	35.1	0.68	0.80
12b	R3	79	1.0	0.094	6.0	LOS A	0.4	9.9	0.55	0.70
Approach		289	1.0	0.283	8.5	LOS A	1.4	35.1	0.64	0.77
SouthWest: NB Littlerock Rd										
5bx	L3	263	1.0	0.757	19.4	LOS B	10.0	253.2	0.92	1.02
2x	T1	305	1.0	0.757	13.0	LOS B	10.0	253.2	0.92	1.02
12ax	R1	79	1.0	0.757	12.6	LOS B	10.0	253.2	0.92	1.02
Approach		647	1.0	0.757	15.5	LOS B	10.0	253.2	0.92	1.02
All Vehicles		2416	1.0	0.757	11.1	LOS B	10.0	253.2	0.81	0.87

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement. LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akcelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Lanes, Volumes, Timings
46: Linderson Way & Israel Rd

Projected 2022 without improvements
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	65	210	50	135	305	25	130	105	115	40	90	80
Future Volume (vph)	65	210	50	135	305	25	130	105	115	40	90	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200	0	200	0	150	0	100	0	100	0	0	0
Storage Lanes	1	0	1	0	0	0	1	0	1	0	0	0
Taper Length (ft)	25	0	25	0	25	0	25	0	25	0	0	0
Right Turn on Red		Yes		Yes		Yes		Yes		Yes		Yes
Link Speed (mph)	30			30			30			30		
Link Distance (ft)	3505			2751			2073			847		
Travel Time (s)	79.7			62.5			47.1			19.3		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	pm+pl	NA	pm+pl	NA	pm+pl	NA	pm+pl	NA	pm+pl	NA	pm+pl	NA
Protected Phases	7	4	3	8	5	2	1	6				
Permitted Phases	4		8		2		6					
Detector Phase	7	4	3	8	5	2	1	6				
Switch Phase												
Minimum Initial (s)	4.0	5.0	4.0	5.0	4.0	6.0	4.0	6.0				
Minimum Spill (s)	8.5	20.5	8.5	20.5	8.5	21.5	8.5	21.5				
Total Split (s)	8.5	20.5	9.0	21.0	8.6	22.0	8.5	21.9				
Total Split (%)	14.2%	34.2%	15.0%	35.0%	14.3%	36.7%	14.2%	36.5%				
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5				
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0				
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimizer?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	None	Max	None	Max				

Area Type:	Other
Cycle Length:	60
Actuated Cycle Length:	53.8
Natural Cycle:	60
Control Type:	Actuated-Uncoordinated

Splits and Phases: 46: Linderson Way & Israel Rd

01	02	03	04
8.5 s	22 s	9 s	20.5 s
05	06	07	08
8.5 s	21.9 s	8.5 s	21 s

Turnwater Transportation Master Plan
SCJ Alliance

Synchro 9 Report
6/10/2016

HCM 2010 Signalized Intersection Summary
46: Linderson Way & Israel Rd

Projected 2022 without improvements
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	65	210	50	135	305	25	130	105	115	40	90	80
Future Volume (veh/h)	65	210	50	135	305	25	130	105	115	40	90	80
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Ob.) veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped Bike Adj(A _{pb})	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/hln	1881	1881	1900	1881	1881	1900	1881	1881	1900	1881	1881	1900
Adj Flow Rate, veh/h	68	221	53	142	321	26	137	111	47	42	95	84
Adj No. of Lanes	1	1	1	1	1	1	1	1	1	1	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh. %	1	1	1	1	1	1	1	1	1	1	1	1
Cap. veh/h	287	310	74	353	421	34	543	441	187	546	288	254
Arrive On Green	0.05	0.21	0.21	0.08	0.25	0.25	0.07	0.35	0.35	0.03	0.31	0.31
Sat Flow veh/h	1792	1467	352	1792	1718	139	1792	1256	532	1792	922	815
Gp Volume(v), veh/h	68	0	274	142	0	347	137	0	158	42	0	179
Gp Sat Flow(s), veh/h	1792	0	1819	1792	0	1857	1792	0	1787	1792	0	1737
Q Serve(g.s), s	1.6	0.0	7.8	3.4	0.0	9.7	2.8	0.0	3.5	0.9	0.0	4.4
Cycle Q Clear(g.c), s	1.6	0.0	7.8	3.4	0.0	9.7	2.8	0.0	3.5	0.9	0.0	4.4
Prop In Lane	1.00	0.19	1.00	0.07	1.00	0.30	1.00	0.30	1.00	0.0	0.47	0.47
Lane Gp Cap(c), veh/h	287	0	385	353	0	456	543	0	627	546	0	542
A/C Ratio(X)	0.24	0.00	0.71	0.40	0.00	0.76	0.25	0.00	0.25	0.08	0.00	0.33
Avail Cap(C-a), veh/h	332	0	522	353	0	549	543	0	627	613	0	542
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(f)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	16.5	0.0	20.4	15.8	0.0	19.5	11.6	0.0	12.9	12.2	0.0	14.7
Incr Delay (d2), s/veh	0.2	0.0	2.9	0.3	0.0	5.1	0.1	0.0	1.0	0.0	0.0	1.6
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackQ(50%),veh/h	0.8	0.0	4.2	1.7	0.0	5.6	1.4	0.0	1.9	0.4	0.0	2.3
LnGrp Delay(d), s/veh	16.7	0.0	23.3	16.1	0.0	24.6	11.7	0.0	13.9	12.3	0.0	16.4
LnGrp LOS	B		C	B		C	B		B		B	B
Approach Vol, veh/h	342			489			295				221	
Approach Delay, s/veh	22.0			22.2			12.9				15.6	
Approach LOS	C			C			B				B	
Timer	1	2	3	4	5	6	7	8				
Assigned Pts	1	2	3	4	5	6	7	8				
Pts Duration (G+Y+Rc), s	6.4	24.1	9.0	16.3	8.6	21.9	7.1	18.2				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	4.0	17.5	4.5	16.0	4.1	17.4	4.0	16.5				
Max Q Clear Time (q_c+1), s	2.9	5.5	5.4	9.8	4.8	6.4	3.6	11.7				
Green Ext Time (p.c.), s	0.0	1.5	0.0	2.0	0.0	1.5	0.0	1.6				

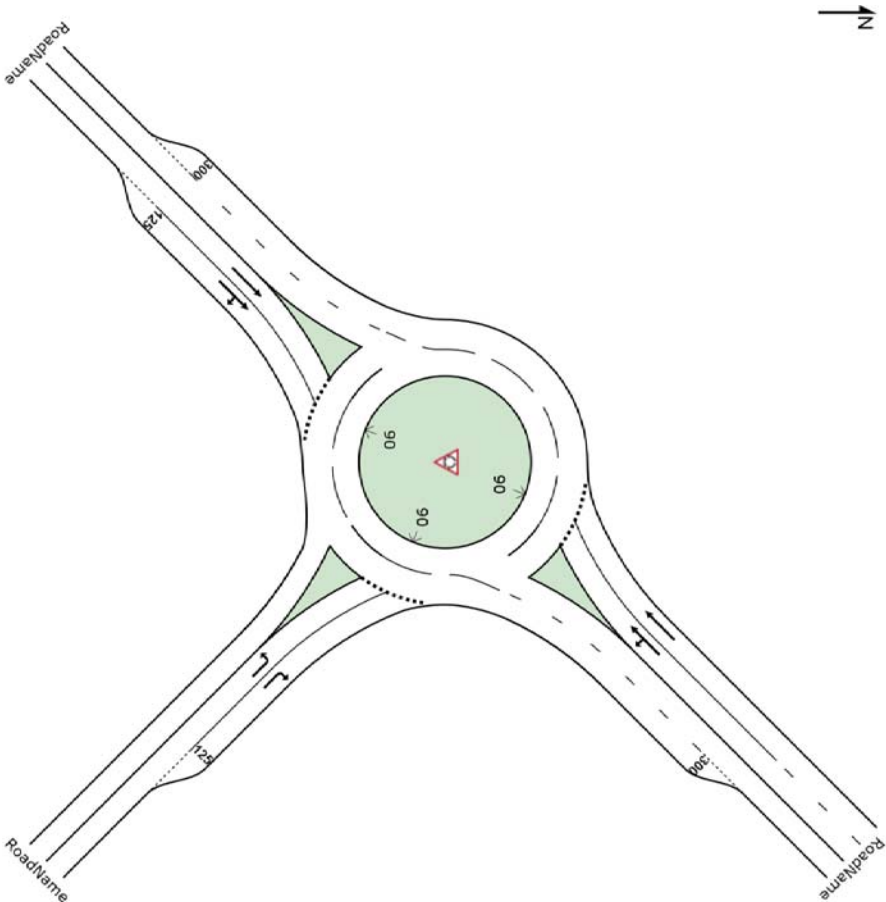
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SCJ Alliance

Synchro 9 Report
6/10/2016

SITE LAYOUT

Site: 47) Litterrock Rd at Turnwater Blvd

Projected 2022 without improvements
PM Peak Hour
Roundabout



MOVEMENT SUMMARY

Site: 47) Litterrock Rd at Turnwater Blvd

Projected 2022 without improvements
PM Peak Hour
Roundabout

Movement Performance - Vehicles									
Mov	OD	Demand Flows		Deg.	Average	Level of	95% Back of Queue	Prop.	Effective
ID	Mov	Total	HV	%	Delay	Service	Vehicles	Distance	Stop Rate
		veh/h		w/c	sec		veh	ft	per veh
SouthEast: RoadName									
3x	L2	314	1.0	0.282	10.7	LOS B	1.5	38.9	0.40
18x	R2	340	1.0	0.299	5.1	LOS A	1.7	42.1	0.40
Approach		654	1.0	0.299	7.8	LOS A	1.7	42.1	0.40
NorthEast: RoadName									
1x	L2	383	1.0	0.491	11.7	LOS B	3.2	80.8	0.58
6x	T1	410	1.0	0.491	6.2	LOS A	3.2	80.8	0.54
Approach		793	1.0	0.491	8.9	LOS A	3.2	80.8	0.56
SouthWest: RoadName									
2x	T1	197	0.0	0.198	5.9	LOS A	1.1	26.5	0.52
12x	R2	181	0.0	0.190	6.0	LOS A	1.0	24.9	0.52
Approach		378	0.0	0.198	5.9	LOS A	1.1	26.5	0.52
All Vehicles		1824	0.8	0.491	7.9	LOS A	3.2	80.8	0.50

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akceik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Lanes, Volumes, Timings 48: I-5 SB Ramps & Turnwater Blvd

Projected 2022 without improvements
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		LT			RT					LT	RT	
Traffic Volume (vph)	0	425	105	365	310	0	0	0	0	400	30	310
Future Volume (vph)	0	425	105	365	310	0	0	0	0	400	30	310
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0	0	0	0	0	0	0	350	0	0
Storage Lanes	0	0	0	0	0	0	0	0	0	1	0	0
Taper Length (ft)	25			25			25			25		
Right Turn on Red		Yes			Yes			Yes			Yes	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1843			807			1457			1571	
Travel Time (s)		41.9			18.3			33.1			35.7	
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 (%)	1%	1%	1%	1%	1%	1%	0%	0%	0%	4%	4%	4%
Shared Lane Traffic (%)		NA		pm+pl	NA					Perm	NA	
Turn Type		4		3	8					6		
Protected Phases		4		8						6		
Permitted Phases		4		8						6		
Detector Phase		4		3	8					6		
Switch Phase												
Minimum Initial (s)		4.0		4.0	4.0			4.0		4.0	4.0	
Minimum Spill (s)		20.5		8.5	20.5			20.5		20.5	20.5	
Total Spill (s)		35.0		9.0	44.0			21.0		21.0	21.0	
Total Split (%)		53.8%		13.8%	67.7%			32.3%		32.3%	32.3%	
Yellow Time (s)		3.5		3.5	3.5			3.5		3.5	3.5	
All-Red Time (s)		1.0		1.0	1.0			1.0		1.0	1.0	
Lost Time Adjust (s)		0.0		0.0	0.0			0.0		0.0	0.0	
Total Lost Time (s)		4.5			4.5			4.5		4.5	4.5	
Lead/Lag		Lag		Lead								
Lead-Lag Optimize?		Yes		Yes								
Recall Mode		None		None	Max			None		None	None	
Intersection Summary												
Area Type:	Other											
Cycle Length:	65											
Actuated Cycle Length:	64.9											
Natural Cycle:	75											
Control Type:	Actuated-Uncoordinated											
Splits and Phases: 48: I-5 SB Ramps & Turnwater Blvd												
<div><div><div><div><div>06</div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div><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HCM 2010 Signalized Intersection Summary 48: I-5 SB Ramps & Turnwater Blvd

Projected 2022 without improvements
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4<1			4					4<1		4<1
Traffic Volume (veh/h)	0	425	105	365	310	0	0	0	0	400	30	310
Future Volume (veh/h)	0	425	105	365	310	0	0	0	0	400	30	310
Number	7	4	14	3	8	18	1	6	16	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A _{pbT})	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/hln	0	1881	1900	1900	1881	0	1881	1900	1827	1827	1827	1900
Adj Flow Rate, veh/h	0	452	112	388	330	0	0	1	0	306	200	154
Adj No. of Lanes	0	2	0	0	1	0	0	1	0	1	0	0
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
Percent Heavy Veh. %	0	1	1	1	1	0	0	4	4	4	4	4
Cap. veh/h	0	1759	433	88	7	0	0	419	231	178	0	0
Arrive On Green	0.00	0.62	0.62	0.62	0.62	0.00	0.00	0.24	0.24	0.24	0.24	0.24
Sat Flow, veh/h	0	2939	700	3	11	0	0	1740	959	738	0	0
Gp Volume(V), veh/h	0	283	281	718	0	0	0	306	0	354	0	0
Gp Sat Flow(s), veh/hln	0	1787	1758	13	0	0	0	1740	0	1697	0	0
Q Serve(g), s	0.0	4.6	4.6	28.2	0.0	0.0	0.0	10.3	0.0	12.8	0.0	0.0
Cycle Q Clear(g-c), s	0.0	4.6	4.6	28.2	0.0	0.0	0.0	10.3	0.0	12.8	0.0	0.0
Prop In Lane	0.00	0.40	0.54	0	0.00	0.00	0.00	1.00	0.44	1.00	0.00	0.00
Lane Grp Cap(c), veh/h	0	1105	1086	0	0	0	0	419	0	409	0	0
V/C Ratio(X)	0.00	0.26	0.26	0.00	0.00	0.00	0.00	0.73	0.00	0.87	0.00	0.00
Avail Cap(c _a), veh/h	0	1105	1086	0	0	0	0	449	0	438	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(f)	0.00	1.00	1.00	1.00	0.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	5.5	5.5	0.0	0.0	0.0	0.0	22.3	0.0	23.3	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.1	0.1	0.0	0.0	0.0	0.0	5.5	0.0	15.7	0.0	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackQ(50%), veh/h	0.0	2.2	2.2	0.0	0.0	0.0	0.0	5.6	0.0	7.8	0.0	0.0
LnGrp Delay(d4), s/veh	0.0	5.7	5.7	0.0	0.0	0.0	0.0	27.9	0.0	39.0	0.0	0.0
LnGrp LOS		A	A					C		D		
Approach Vol, veh/h	564											
Approach Delay, s/veh	5.7											
Approach LOS	A											
Timer	1	2	3	4	5	6	7	8				
Assigned Pts	4											
Pts Duration (G+Y+Rc), s	44.0											
Change Period (Y+Rc), s	4.5											
Max Green Setting (Gmax), s	30.5											
Max O Clear Time (g_c+H), s	6.6											
Green Ext Time (p.c.), s	11.5											
	0.6											
	6.1											

HCM 2010 TWSC
49: I-5 NB Ramps & Turnwater Blvd

Projected 2022 without improvements
PM Peak Hour

Intersection											
Int Delay, s/veh	19.8										
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	195	630	0	0	610	1205	65	5	150	0	0
Future Vol, veh/h	195	630	0	0	610	1205	65	5	150	0	0
Conflicting Peds. #/hr	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Free	-	-	None	-	None
Storage Length	150	-	-	-	-	0	-	-	150	-	-
Vehicle 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
Heavy Vehicles, %	3	3	3	1	1	1	3	3	3	0	0
Wmtl Flow	222	716	0	0	693	1369	74	6	170	0	0

Major/Minor		Major1		Major2		Minor1	
Conflicting Flow All	693	0	-	-	0	1852	1852
Stage 1	-	-	-	-	-	1159	1159
Stage 2	-	-	-	-	-	693	693
Critical Hdwy	4145	-	-	-	-	6,645	6,545
Critical Hdwy Sig 1	-	-	-	-	-	5,845	5,545
Critical Hdwy Sig 2	-	-	-	-	-	5,445	5,545
Follow-up Hdwy	2,2285	-	-	-	-	3,5285	4,0285
Pot Cap-1 Maneuver	895	-	0	0	0	72	73
Stage 1	-	-	0	0	0	260	268
Stage 2	-	-	0	0	0	493	442
Platoon blocked, %	-	-	-	-	-	-	-
Max Cap-1 Maneuver	895	-	-	-	-	-	54
Max Cap-2 Maneuver	-	-	-	-	-	-	54
Stage 1	-	-	-	-	-	196	0
Stage 2	-	-	-	-	-	493	0

Approach		EB		WB		NB	
HCM Control Delay, s	2.4			0		140.3	
HCM LOS						F	
Minor Lane/Major Wmtl		NBL	NBL2	EBL	EBT	WBT	
Capacity (veh/h)	54	637	895	-	-	-	
HCM Lane V/C Ratio	1.473	0.268	0.248	-	-	-	
HCM Control Delay (s)	\$ 413.7	12.7	10.3	-	-	-	
HCM Lane LOS	F	B	B	-	-	-	
HCM 95th %ile Q(veh)	7.3	1.1	1	-	-	-	

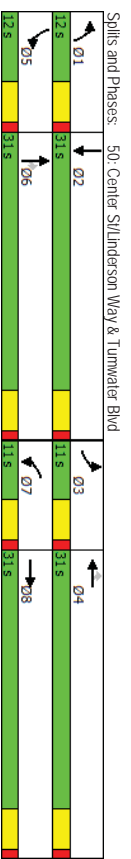
Notes
- : Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Lanes, Volumes, Timings
50: Center St/Linderson Way & Turnwater Blvd

Projected 2022 without improvements
PM Peak Hour

Lane Group											
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Traffic Volume (vph)	130	595	150	105	755	30	170	105	55	185	185
Future Volume (vph)	130	595	150	105	755	30	170	105	55	185	185
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300	0	350	250	250	150	300	700	1	1	1
Storage Lanes	2	1	0	1	1	1	1	1	1	1	1
Taper Length (ft)	25	25	25	25	25	25	25	25	25	25	25
Right Turn on Red	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Link Speed (mph)	30	895	1275	1023	2073	2073	2073	2073	2073	2073	2073
Link Distance (ft)	20.3	20.3	29.0	23.3	47.1	47.1	47.1	47.1	47.1	47.1	47.1
Travel Time (s)	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
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
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)	Prot	NA	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Free
Turn Type	3	8	7	4	4	1	6	6	5	2	Free
Permitted Phases	3	8	7	4	4	1	6	6	5	2	Free
Detector Phase	3	8	7	4	4	1	6	6	5	2	Free
Switch Phase											
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Minimum Spill (s)	11.0	31.0	11.0	31.0	31.0	11.0	31.0	31.0	11.0	31.0	31.0
Total Split (s)	11.0	31.0	11.0	31.0	31.0	12.0	31.0	31.0	12.0	31.0	31.0
Total Split (%)	12.9%	36.5%	12.9%	36.5%	14.1%	36.5%	14.1%	36.5%	14.1%	36.5%	36.5%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimizer?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	None	Max	Max	None	None	None	None	None	None

Intersection Summary		Other	
Area Type:	Other		
Cycle Length: 85			
Actuated Cycle Length: 71.8			
Natural Cycle: 85			
Control Type: Actuated-Uncoordinated			



HCM 2010 Signalized Intersection Summary
50: Center St/Linderson Way & Turnwater Blvd

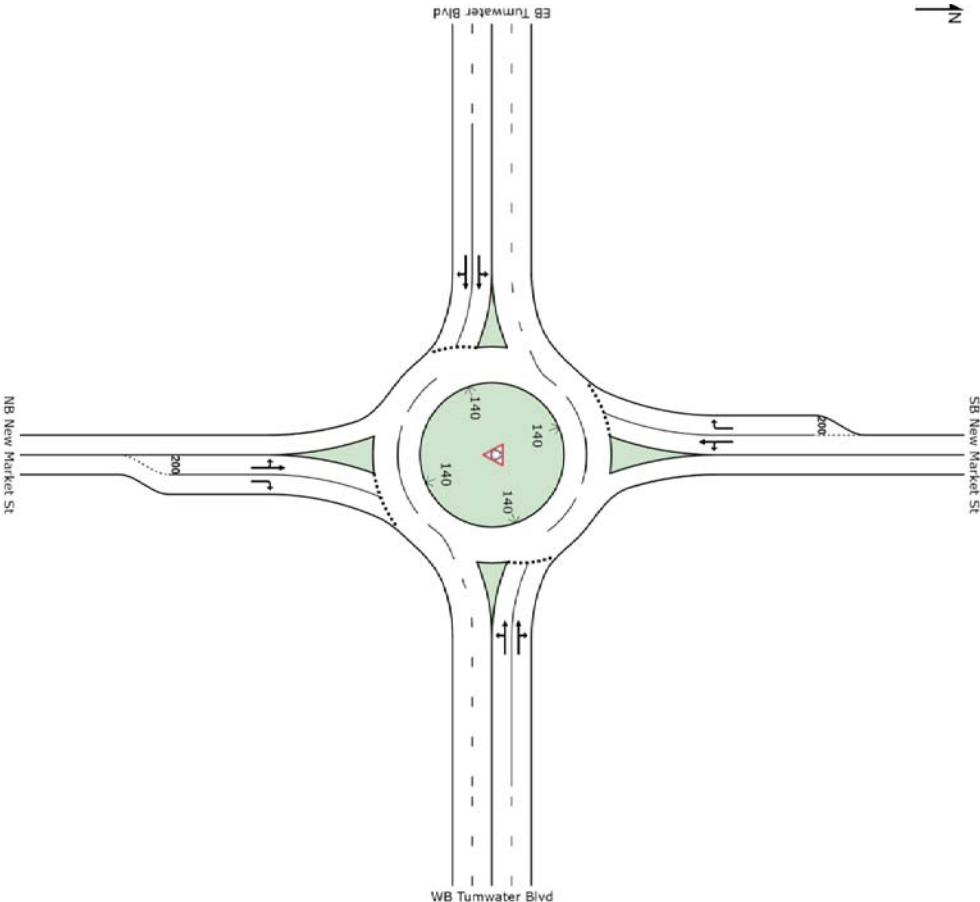
Projected 2022 without improvements
PM Peak Hour

	←	→	↖	↗	↘	↙	↕	↗	↘	↙	↕
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Lane Configurations	↖ ↗	↖ ↗	↖ ↗	↖ ↗	↖ ↗	↖ ↗	↖ ↗	↖ ↗	↖ ↗	↖ ↗	↖ ↗
Traffic Volume (veh/h)	130	595	150	105	755	30	170	105	55	185	875
Future Volume (veh/h)	130	595	150	105	755	30	170	105	55	185	875
Number	3	8	18	7	4	14	1	6	16	5	2
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0
Ped Bike Adj(A_pb7)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/hln	1863	1863	1900	1881	1881	1881	1881	1881	1881	1881	1881
Adj Flow Rate, veh/h	138	633	160	112	803	32	181	112	59	197	0
Adj No of Lanes	2	2	0	1	2	1	1	1	1	1	1
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
Percent Heavy Veh. %	2	2	2	1	1	1	1	1	1	1	1
Cap. veh/h	277	1055	266	143	1343	601	181	289	245	181	289
Arrive On Green	0.08	0.38	0.38	0.08	0.38	0.38	0.10	0.15	0.15	0.10	0.15
Sat Flow, veh/h	3442	2801	707	1792	3574	1599	1792	1881	1599	1792	1881
Grip Volume(V), veh/h	138	400	393	112	803	32	181	112	59	197	0
Grip Sat Flow(s), veh/hln	1721	1770	1738	1792	1787	1599	1792	1881	1599	1792	1881
Q Serve(s), s	2.7	12.6	12.6	4.2	12.5	0.9	7.0	3.7	2.2	7.0	6.9
Cycle Q Clear(g,c), s	2.7	12.6	12.6	4.2	12.5	0.9	7.0	3.7	2.2	7.0	6.9
Prop In Lane	1.00	0.41	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Grp Cap(c), veh/h	277	666	654	143	1343	601	181	289	245	181	289
W/C Ratio(X)	0.50	0.60	0.60	0.78	0.60	0.05	1.00	0.39	0.24	1.09	0.68
Avail Cap(c, a), veh/h	298	666	654	155	1343	601	181	707	601	181	707
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(f)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	30.5	17.4	17.4	31.3	17.4	13.8	31.1	26.4	25.7	31.1	27.7
Incr Delay (d2), s/veh	1.4	4.0	4.1	21.1	2.0	0.2	66.5	0.9	0.5	92.0	2.8
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackQ(50%), veh/h	1.3	6.8	6.7	2.9	6.5	0.4	6.8	2.0	1.0	8.1	3.8
LnGrp Delay(d), s/veh	31.8	21.3	21.4	52.3	19.4	13.9	97.6	27.2	26.2	123.1	30.5
LnGrp LOS	C	C	C	D	B	B	F	C	C	F	C
Approach Vol, veh/h	931			947			352			394	
Approach Delay, s/veh	22.9			23.1			63.2			76.8	
Approach LOS	C			C			E			E	
Timer	1	2	3	4	5	6	7	8			
Assigned Phs	1	2	3	4	5	6	7	8			
Phs Duration (G+Y+Rd), s	120	15.6	10.6	31.0	12.0	15.6	10.5	31.1			
Change Period (Y+Rd), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0			
Max Green Setting (Gmax), s	7.0	26.0	6.0	26.0	7.0	26.0	6.0	26.0			
Max Q Clear Time (Q_c+1), s	9.0	8.9	4.7	14.5	9.0	5.7	6.2	14.6			
Green Ext Time (Q_c), s	0.0	1.8	0.0	7.6	0.0	1.9	0.0	7.5			
Intersection Summary											
HCM 2010 Ctrl Delay	36.5										
HCM 2010 LOS	D										

SITE LAYOUT

Site: 51) New Market Rd at Turnwater Blvd

Projected 2022 without improvements
PM Peak Hour
Roundabout



MOVEMENT SUMMARY

Site: 51) New Market Rd at Turnwater Blvd

Projected 2022 without improvements
PM Peak Hour
Roundabout

Movement Performance - Vehicles										
Mov	OD	Demand Flows	Deg.	Average	Level of	95% Back of Queue	Pop.	Effective	Average	
ID	Mov	Total	HTV	Satn	Delay	Service	Vehicles	Stop Rate	Speed	
		veh/h	%	v/c	sec		Distance	per veh	per veh	mph
Scout: NB New Market St										
3	L2	22	0.0	0.043	13.5	LOS B	0.2	4.1	0.60	0.78
8	T1	5	0.0	0.043	6.4	LOS A	0.2	4.1	0.60	0.78
18	R2	65	0.0	0.073	5.8	LOS A	0.3	7.6	0.58	0.67
Approach										
		92	0.0	0.073	7.6	LOS A	0.3	7.6	0.59	0.71
East WB Turnwater Blvd										
1	L2	65	2.0	0.316	10.7	LOS B	2.1	52.3	0.28	0.41
6	T1	815	2.0	0.316	3.5	LOS A	2.1	52.9	0.27	0.37
16	R2	27	2.0	0.316	3.9	LOS A	2.1	52.9	0.26	0.35
Approach										
		908	2.0	0.316	4.1	LOS A	2.1	52.9	0.27	0.38
North: SB New Market St										
7	L2	60	4.0	0.118	13.4	LOS B	0.4	11.4	0.58	0.80
4	T1	22	4.0	0.118	6.3	LOS A	0.4	11.4	0.58	0.80
14	R2	147	4.0	0.163	5.9	LOS A	0.7	17.0	0.57	0.69
Approach										
		228	4.0	0.163	7.9	LOS A	0.7	17.0	0.57	0.73
West: EB Turnwater Blvd										
5	L2	49	4.0	0.360	11.2	LOS B	2.4	62.6	0.41	0.44
2	T1	875	4.0	0.360	4.0	LOS A	2.5	63.9	0.40	0.41
12	R2	27	4.0	0.360	4.4	LOS A	2.5	63.9	0.39	0.39
Approach										
		951	4.0	0.360	4.4	LOS A	2.5	63.9	0.40	0.41
All Vehicles										
		2179	3.0	0.360	4.7	LOS A	2.5	63.9	0.37	0.44
										37.4

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik MSD).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Organisation: SCJ ALLIANCE | Processed: Wednesday, June 8, 2016 9:37:07 AM
Project: N:\projects\0625_City of Turnwater\0625.17 Turnwater Transportation Master Plan\Traffic\Operations\sidra 2022 Baseline\Existing 2022 PM.sp6

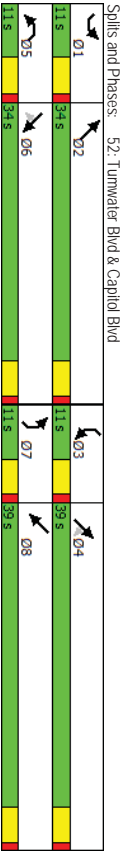
Lanes, Volumes, Timings
52: Turnwater Blvd & Capitol Blvd

Projected 2022 without improvements

PM Peak Hour

Lane Group	SEL	SET	SER	NWL	NWR	NEL	NET	NER	SWL	SWR
Lane Configurations										
Traffic Volume (vph)	120	475	175	200	305	20	325	245	85	340
Future Volume (vph)	120	475	175	200	305	20	325	245	85	340
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250	0	200	0	275	0	200	0	200	0
Storage Lanes	1	1	2	1	2	1	1	1	1	0
Taper Length (ft)	25			25					25	
Right Turn on Red			Yes		Yes		Yes		Yes	
Link Speed (mph)		50			50		30		30	
Link Distance (ft)		934			3620		2404		1729	
Travel Time (s)		12.7			49.4		54.6		39.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	1%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)										
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Perm	Prot	NA
Protected Phases	1	6		5	2	7	4		3	8
Permitted Phases										
Detector Phase	1	6	6	5	2	7	4	4	3	8
Switch Phase										
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Minimum Spill (s)	11.0	34.0	34.0	11.0	34.0	11.0	39.0	39.0	11.0	39.0
Total Spill (s)	11.0	34.0	34.0	11.0	34.0	11.0	39.0	39.0	11.0	39.0
Total Split (%)	11.6%	35.8%	35.8%	11.6%	35.8%	11.6%	41.1%	41.1%	11.6%	41.1%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lead	Lag	Lag	Lag	Lead	Lag
Lead-Lag Optimizer?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	Max	None	Max	None	None	None	None	None

Intersection Summary		Other	
Area Type:			
Cycle Length: 95			
Actuated Cycle Length: 83.7			
Natural Cycle: 95			
Control Type: Actuated-Uncoordinated			



HCM 2010 Signalized Intersection Summary 52: Tumwater Blvd & Capitol Blvd

Projected 2022 without improvements

PM Peak Hour

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	120	475	175	200	305	20	90	325	245	85	340	15
Future Volume (vph)	120	475	175	200	305	20	90	325	245	85	340	15
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Q ₀), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped Bike Adj(A _{pb})	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/hln	1845	1845	1845	1881	1881	1881	1881	1881	1881	1881	1881	1900
Adj Flow Rate, veh/h	133	528	116	222	339	22	100	361	33	94	378	17
Adj No of Lanes	1	1	1	2	2	0	1	1	1	1	2	0
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
Percent Heavy Veh. %	3	3	3	1	1	1	1	1	1	1	1	1
Cap. veh/h	130	658	559	257	1216	79	128	482	410	120	879	39
Arrive On Green	0.07	0.36	0.36	0.07	0.36	0.36	0.07	0.26	0.26	0.07	0.25	0.25
Sat Flow, veh/h	1757	1845	1568	3476	3409	220	1792	1881	1599	1792	3484	156
Gp Volume(V _g), veh/h	133	528	116	222	177	184	100	361	33	94	193	202
Gp Sat Flow(S _g), veh/hln	1757	1845	1568	1738	1787	1842	1792	1881	1599	1792	1787	1854
Q Serve(g _s), s	6.0	21.0	4.2	5.1	5.7	5.8	4.5	14.4	1.3	4.2	7.4	7.4
Cycle Q Clear(g _c), s	6.0	21.0	4.2	5.1	5.7	5.8	4.5	14.4	1.3	4.2	7.4	7.4
Prop In Lane	1.00	1.00	1.00	1.00	0.12	1.00	1.00	1.00	1.00	1.00	0.08	0.08
Lane Grp Cap(c _g), veh/h	130	658	559	257	638	657	128	482	410	120	451	467
W/C Ratio(X)	1.03	0.80	0.21	0.87	0.28	0.28	0.78	0.75	0.08	0.78	0.43	0.43
Avail Cap(c _a), veh/h	130	658	559	257	638	657	132	787	669	132	748	775
Upstream Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay(d _u), s/veh	37.6	23.6	18.2	37.2	18.7	18.7	37.1	27.8	23.0	37.3	25.5	25.5
Incr Delay(d ₂), s/veh	86.0	10.0	0.8	25.1	1.1	1.1	22.9	2.4	0.1	20.7	0.6	0.6
Initial Q Delay(d ₃), s/veh	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back(Q/50%), veh/h	6.0	12.4	1.9	3.4	3.0	3.1	3.0	7.7	0.6	2.8	3.7	3.9
LnGrp Delay(d _l), s/veh	124.0	33.5	19.0	62.4	19.7	19.7	60.0	30.2	23.0	58.0	26.1	26.1
LnGrp LOS	F	C	B	E	B	B	E	C	C	E	C	C
Approach Vol, veh/h	777											
Approach Delay, s/veh	46.8											
Approach LOS	D											
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+R ₀), s	11.0	34.0	10.5	25.8	11.0	34.0	10.8	25.5				
Change Period (Y+R ₀), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0				
Max Green Setting (G _{max}), s	6.0	29.0	6.0	34.0	6.0	29.0	6.0	34.0				
Max Q Clear Time (Q _c +t ₁), s	8.0	7.8	6.2	16.4	7.1	23.0	6.5	9.4				
Green Ext Time (Q _c), s	0.0	6.5	0.0	4.5	0.0	3.1	0.0	5.0				
Intersection Summary												
HCM 2010 Ctrl Delay	388											
HCM 2010 LOS	D											

Lanes, Volumes, Timings 53: 65th Ave & Henderson Blvd

Projected 2022 without improvements

PM Peak Hour

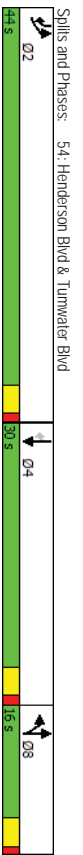
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	870	70	80	565	5	35	0	55	5	0	2
Future Volume (vph)	5	870	70	80	565	5	35	0	55	5	0	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100	0	150	0	0	0	0	0	0	0	0	0
Storage Lanes	1	0	1	0	1	0	0	0	0	0	0	0
Taper Length (ft)	25			25			25			25		
Right Turn on Red		Yes		Yes		Yes		Yes		Yes		Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2111			1760			704			354	
Travel Time (s)		48.0			40.0			16.0			8.0	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Turn Type	Perm	2	2	6	6	6	8	8	4	4	4	4
Permitted Phases	2	2	2	6	6	6	8	8	4	4	4	4
Detector Phase	2	2	2	6	6	6	8	8	4	4	4	4
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Minimum Spill (s)	27.5	27.5	27.5	27.5	27.5	27.5	12.5	12.5	27.5	27.5	27.5	27.5
Total Spill (s)	52.5	52.5	52.5	52.5	52.5	52.5	27.5	27.5	27.5	27.5	27.5	27.5
Total Split (%)	65.6%	65.6%	65.6%	65.6%	65.6%	65.6%	34.4%	34.4%	34.4%	34.4%	34.4%	34.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
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	4.5
Lead/Lag												
Lead-Lag Optimizer?												
Recall Mode	Max	Max	Max	Max	Max	Max	None	None	None	None	None	None
Intersection Summary												
Area Type:	Other											
Cycle Length: 80												
Actuated Cycle Length: 71.9												
Natural Cycle: 90												
Control Type: Actuated-Uncoordinated												
Spills and Phases: 53: 65th Ave & Henderson Blvd												

HCM 2010 Signalized Intersection Summary Projected 2022 without improvements 53: 65th Ave & Henderson Blvd PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (veh/h)	5	870	70	80	565	5	35	0	55	5	0	2
Future Volume (veh/h)	5	870	70	80	565	5	35	0	55	5	0	2
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped Bike Adj(A, pb7)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/hln	1881	1881	1900	1881	1881	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	5	956	77	88	621	5	38	0	60	5	0	2
Adj No of Lanes	1	1	0	1	1	0	1	0	1	0	1	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh. %	1	1	1	1	1	1	1	0	0	0	0	0
Arrive On Green	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.11	0.00	0.11	0.00	0.11
Sat Flow, veh/h	804	1718	138	549	1864	15	469	143	966	1026	151	471
Grp Volume(V), veh/hln	5	0	1033	88	0	626	98	0	7	0	7	0
Grp Sat Flow(s), veh/hln	804	0	1857	549	0	1879	1579	0	0	1647	0	0
Q Serve(g.s), s	0.1	0.0	19.8	6.8	0.0	7.9	2.2	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g.c), s	8.0	0.0	19.8	26.5	0.0	7.9	3.7	0.0	0.0	0.2	0.0	0.0
Prop In Lane	1.00	1.00	0.07	1.00	0.01	0.39	0.61	0.71	0.61	0.71	0.0	0.29
Lane Grp Cap(c), veh/h	619	0	1398	356	0	1414	246	0	271	0	0	0.00
W/C Ratio(X)	0.01	0.00	0.74	0.25	0.00	0.44	0.40	0.00	0.03	0.00	0.00	0.00
Avail Cap(c, a), veh/h	619	0	1398	356	0	1414	638	0	635	0	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Upstream Filter(f)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	4.4	0.0	4.4	11.8	0.0	2.9	27.1	0.0	0.0	25.6	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	3.5	1.6	0.0	1.0	1.3	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackQ(50%), veh/hln	0.0	0.0	11.1	1.2	0.0	4.4	1.7	0.0	0.0	0.1	0.0	0.0
Lngrp Delay(d), s/veh	4.4	0.0	7.9	13.4	0.0	3.9	28.4	0.0	0.0	25.6	0.0	0.0
Lngrp LOS	A		A	B		A	C		C			
Approach Vol, veh/h		1038		714		98		7				
Approach Delay, s/veh		7.9		5.1		28.4		25.6				
Approach LOS		A		A		C		C				
Timer	1	2	3	4	5	6	7	8				
Assigned PIs		2		4		6		8				
PIs Duration (G+Y+Rd), s		52.5		11.3		52.5		11.3				
Change Period (Y+Rd), s		4.5		4.5		4.5		4.5				
Max Green Sdting (Gmax), s		48.0		23.0		48.0		23.0				
Max Q Clear Time (G+ch1), s		21.8		2.2		28.5		5.7				
Green Ext Time (p-c), s		18.7		0.6		14.8		0.5				
Intersection Summary												
HCM 2010 Crt Delay				8.0								
HCM 2010 LOS				A								







Lanes, Volumes, Timings Projected 2022 without improvements 54: Henderson Blvd & Tumwater Blvd PM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBL	SBR
Lane Configurations	EBL	EBR	NBL	NBT	SBL	SBR
Traffic Volume (vph)	685	30	25	170	215	355
Future Volume (vph)	685	30	25	170	215	355
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0	0	0	100
Storage Lanes	1	0	0	0	0	1
Taper Length (ft)	25		25			
Right Turn on Red		Yes			Yes	
Link Speed (mph)	35		35		35	
Link Distance (ft)	3122		2394		2111	
Travel Time (s)	60.8		46.6		41.1	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)						
Turn Type	Prot		Split	NA	NA	pm+ov
Protected Phases	2		8	8	4	2
Permitted Phases						
Detector Phase	2		8	8	4	2
Switch Phase						
Minimum Initial (s)	6.0		6.0	6.0	6.0	6.0
Minimum Spill (s)	20.5		10.5	10.5	30.0	20.5
Total Spill (s)	44.0		16.0	16.0	30.0	44.0
Total Spill (%)	48.9%		17.8%	17.8%	33.3%	48.9%
Yellow Time (s)	3.0		3.0	3.0	3.0	3.0
All-Red Time (s)	1.0		1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0		4.0	4.0	4.0	4.0
Lead-Lag Optimize?						
Recall Mode	Max		None	None	Max	Max
Intersection Summary						
Area Type:		Other				
Cycle Length: 90						
Actuated Cycle Length: 90						
Natural Cycle: 90						
Control Type: Actuated-Uncoordinated						



HCM 2010 Signalized Intersection Summary
54: Henderson Blvd & Turnwater Blvd

Projected 2022 without improvements
PM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations								
Traffic Volume (veh/h)	685	30	25	170	215	355		
Future Volume (veh/h)	685	30	25	170	215	355		
Number	5	12	3	8	4	14		
Initial Q (Qb), veh	0	0	0	0	0	0		
PedBike Adj(A _{pb} 7)	1.00	1.00	1.00	1.00	1.00	1.00		
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/hln	1881	1900	1900	1881	1881	1881		
Adj Flow Rate, veh/h	753	33	27	187	236	269		
Adj No of Lanes	0	0	0	1	1	1		
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91		
Percent Heavy Veh. %	0	0	1	1	1	1		
Cap, veh/h	758	33	31	218	543	1173		
Arrive On Green	0.44	0.44	0.13	0.13	0.29	0.29		
Sat Flow, veh/h	1706	75	236	1634	1881	1599		
Grip Volume(V), veh/h	787	0	214	0	236	269		
Grip Sat Flow(s), veh/hln	1783	0	1869	0	1881	1599		
Q Serve(g, s), s	39.5	0.0	10.1	0.0	9.2	4.9		
Cycle Q Clear(g, c), s	39.5	0.0	10.1	0.0	9.2	4.9		
Prop In Lane	0.96	0.04	0.13	0.0	1.00	1.00		
Lane Grip Cap(c), veh/h	792	0	249	0	543	1173		
V/C Ratio(X)	0.99	0.00	0.86	0.00	0.43	0.23		
Avail Cap(c, a), veh/h	792	0	249	0	543	1173		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(f)	1.00	0.00	1.00	0.00	1.00	1.00		
Uniform Delay (d), s/veh	24.9	0.0	38.2	0.0	26.0	3.8		
Incr Delay (d2), s/veh	30.4	0.0	24.9	0.0	2.5	0.5		
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackQ(50%), veh/hln	25.9	0.0	6.9	0.0	5.2	5.8		
LnGP Delay(d), s/veh	55.3	0.0	63.1	0.0	28.5	4.3		
LnGP LOS	E	E	E	C	A	A		
Approach Vol, veh/h	787		214		505			
Approach Delay, s/veh	55.3		63.1		15.6			
Approach LOS	E		E		B			
Timer	1	2	3	4	5	6	7	8
Assigned Pns		2		4				8
Pns Duration (G+Y+R), s		44.0		30.0				16.0
Change Period (Y+R), s		4.0		4.0				4.0
Max Green Setting (G _{max}), s		40.0		26.0				12.0
Max Q Clear Time (G, c+1), s		41.5		11.2				12.1
Green Ext Time (p, c), s		0.0		2.4				0.0
Intersection Summary								
HCM 2010 Ctrl Delay	43.1							
HCM 2010 LOS	D							
Notes								

HCM 2010 TWSC
55: Henderson Blvd & Trails End Dr

Projected 2022 without improvements
PM Peak Hour

Intersection									
Int Delay, s/veh	4.3								
Movement									
	NWL	NWR	NET	NER	SWL	SWT			
Traffic Vol, veh/h	60	55	160	95	125	145			
Future Vol, veh/h	60	55	160	95	125	145			
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	-	-	-	-	-			
Peak Hour Factor	87	87	87	87	87	87			
Heavy Vehicles, %	0	0	1	1	1	1			
Mvmt Flow	69	63	184	109	144	167			







Major/Minor									
Conflicting Flow All	Minor1		Major1		Major2				
Stage 1	693	239	0	0	293	0			
Stage 2	454	-	-	-	-	-			
Critical Hdwy	6.4	6.2	-	-	4.11	-			
Critical Hdwy Sig 1	5.4	-	-	-	-	-			
Critical Hdwy Sig 2	5.4	-	-	-	-	-			
Follow-up Hdwy	3.5	3.3	-	-	2.209	-			
Pot Cap-1 Maneuver	412	805	-	-	1274	-			
Stage 1	805	-	-	-	-	-			
Platoon blocked, %	644	-	-	-	-	-			
Mov Cap-1 Maneuver	361	805	-	-	1274	-			
Mov Cap-2 Maneuver	361	-	-	-	-	-			
Stage 1	805	-	-	-	-	-			
Stage 2	564	-	-	-	-	-			

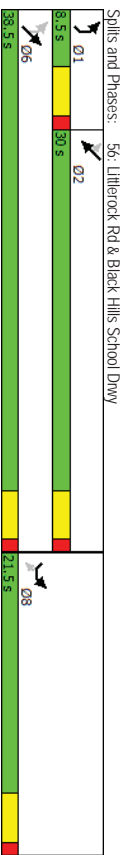
Approach									
	NW		NE		SW				
HCM Control Delay, s	15		0		3.8				
HCM LOS	C								
Minor Lane/Major Mvmt									
	NET	NER	NWL	SWL	SWT				
Capacity (veh/h)	-	-	490	1274	-				
HCM Lane V/C Ratio	-	-	0.27	0.113	-				
HCM Control Delay (s)	-	-	15	8.2	0				
HCM Lane LOS	-	-	C	A	A				
HCM 95th %ile Delay	-	-	1.1	0.4	-				

Lanes, Volumes, Timings 56: Litterock Rd & Black Hills School Drwy

Projected 2022 without improvements

PM Peak Hour







Lane Group	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Volume (vph)	5	10	10	205	450	55
Future Volume (vph)	5	10	10	205	450	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200	0	175	1900	350	1
Storage Lanes	1	1	1	1	1	1
Taper Length (ft)	25		25			
Right Turn on Red		Yes			Yes	
Link Speed (mph)	30			30	30	
Link Distance (ft)	1065			1067	3970	
Travel Time (s)	24.2			24.3	90.2	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	1%	1%	1%	1%
Shared Lane Traffic (%)						
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	8	8	6	6	2	2
Permitted Phases	8	8	1	6	2	2
Detector Phase	8	8	1	6	2	2
Switch Phase						
Minimum Initial (s)	7.0	7.0	4.0	7.0	7.0	7.0
Minimum Spill (s)	21.5	21.5	8.5	24.5	27.5	27.5
Total Spill (s)	21.5	21.5	8.5	38.5	30.0	30.0
Total Split (%)	35.8%	35.8%	14.2%	64.2%	50.0%	50.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag			Lead	Lag	Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	Max	None	None
Intersection Summary						
Area Type:	Other					
Cycle Length:	60					
Actuated Cycle Length:	53.7					
Natural Cycle:	60					
Control Type:	Actuated-Uncoordinated					



HCM 2010 Signalized Intersection Summary 56: Litterock Rd & Black Hills School Drwy

Projected 2022 without improvements

PM Peak Hour

Movement	SEL	SER	NEL	NET	SWT	SWR		
Lane Configurations								
Traffic Volume (veh/h)	5	10	10	205	450	55		
Future Volume (veh/h)	5	10	10	205	450	55		
Number	3	18	1	6	2	12		
Initial Q (Ob) veh	0	0	0	0	0	0		
Ped.Bike Adj(A_pb7)	1.00	1.00	1.00	1.00	1.00	1.00		
Parking Bus. Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/hln	1900	1881	1881	1881	1881	1881		
Adj Flow Rate, veh/h	5	11	11	216	474	58		
Adj No. of Lanes	1	1	1	1	1	1		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95		
Percent Heavy Veh. %	0	0	1	1	1	1		
Cap. veh/h	51	46	656	1445	1233	1048		
Arrive On Green	0.03	0.03	0.01	0.77	0.66	0.66		
Sat Flow, veh/h	1810	1615	1792	1881	1881	1599		
Gp Volume(v), veh/h	5	11	11	216	474	58		
Gp Sat Flow(s),veh/hln	1810	1615	1792	1881	1881	1599		
Q Serve(g.s), s	0.1	0.3	0.1	1.3	5.1	0.6		
Cycle Q Clear(g.c), s	0.1	0.3	0.1	1.3	5.1	0.6		
Prop in Lane	1.00	1.00	1.00	1.00	1.00	1.00		
Lane Gp Cap(c), veh/h	51	46	656	1445	1233	1048		
W/C Ratio(X)	0.10	0.24	0.02	0.15	0.38	0.06		
Avail Cap(C_a), veh/h	695	620	797	1445	1233	1048		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(f)	1.00	1.00	1.00	1.00	1.00	1.00		
Uniform Delay (d), s/veh	21.0	21.0	2.4	1.3	3.5	2.7		
Incr Delay (d2), s/veh	0.8	2.7	0.0	0.2	0.2	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackQ(50%),veh/hln	0.1	0.2	0.0	0.7	2.7	0.2		
LnGrp Delay(d),s/veh	218	237	2.4	1.6	3.8	2.8		
LnGrp LOS	C	C	A	A	A	A		
Approach Vol, veh/h	16		227	532				
Approach Delay, s/veh	23.1		1.6	3.6				
Approach LOS	C		A	A				
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	5.0	33.5				38.5		5.7
Change Period (Y+Rc), s	4.5	4.5				4.5		4.5
Max Green Setting (Gmax), s	4.0	25.5				34.0		17.0
Max Q Clear Time (q_c+1), s	2.1	7.1				3.3		2.3
Green Ext Time (p.c), s	0.0	5.2				6.1		0.0
Intersection Summary								
HCM 2010 Cnt Delay	3.4							
HCM 2010 LOS	A							

HCM 2010 TWSC
57: Center St & 76th Ave

Projected 2022 without improvements
PM Peak Hour

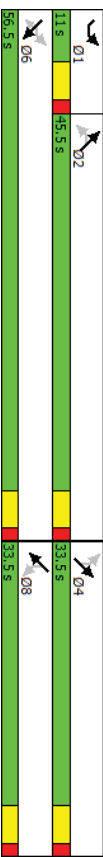
Intersection													
Int Delay, s/veh 2.6													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Traffic Vol, veh/h	60	10	1	10	10	20	1	265	0	10	335	85	
Future Vol, veh/h	60	10	1	10	10	20	1	265	0	10	335	85	
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None	
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-	
Vehicle in Median Storage, #	-	0	-	-	-	0	-	-	0	-	-	0	
Grade, %	-	0	-	-	-	0	-	-	0	-	-	0	
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92	
Heavy Vehicles, %	3	3	3	11	11	11	1	1	1	3	3	3	
Wmt Flow	65	11	1	11	11	22	1	288	0	11	364	92	
Major/Minor													
Conflicting Flow All	739	722	410	728	768	288	457	0	0	288	0	0	
Stage 1	432	432	-	290	290	-	-	-	-	-	-	-	
Stage 2	307	290	-	438	478	-	-	-	-	-	-	-	
Critical Hdwy Spt 1	7.13	6.53	6.23	7.21	6.61	6.31	4.11	-	-	4.13	-	-	
Critical Hdwy Spt 2	6.13	5.53	-	6.21	5.61	-	-	-	-	-	-	-	
Follow-up Hdwy	3.527	4.027	3.327	3.599	4.099	3.399	2.209	-	-	2.227	-	-	
Platoon blocked, %	332	352	639	328	322	730	1109	-	-	1268	-	-	
Stage 1	600	581	-	699	656	-	-	-	-	-	-	-	
Stage 2	701	670	-	580	541	-	-	-	-	-	-	-	
Major Cap-1 Maneuver	311	347	639	316	318	730	1109	-	-	1268	-	-	
Major Cap-2 Maneuver	311	347	-	316	318	-	-	-	-	-	-	-	
Stage 1	599	574	-	698	655	-	-	-	-	-	-	-	
Stage 2	668	669	-	561	535	-	-	-	-	-	-	-	
Approach													
HCM Control Delay, s	19.9			WB			NB			SB			
HCM LOS	C			B			C			0.2			
Minor Lane/Major Wmt													
Capacity (veh/h)	1109	-	-	318	442	1268	-	-	-	-	-	-	
HCM Lane V/C Ratio	0.001	-	-	0.243	0.098	0.009	-	-	-	-	-	-	
HCM Control Delay (s)	8.2	0	-	19.9	14	7.9	0	-	-	-	-	-	
HCM Lane LOS	A	A	-	C	B	A	A	-	-	-	-	-	
HCM 95th %ile Q(veh)	0	-	-	0.9	0.3	0	-	-	-	-	-	-	

Lanes, Volumes, Timings
58: Old Hwy 99 & Henderson Blvd

Projected 2022 without improvements
PM Peak Hour

Lane Group	SEL	SET	SER	NWL	NWR	NEL	NET	NER	SWL	SWR
Lane Configurations										
Traffic Volume (vph)	110	865	10	540	115	15	5	5	150	5
Future Volume (vph)	110	865	10	2	540	115	15	5	150	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150	50	50	50	0	0	0	150	0	0
Storage Lanes	1	1	1	1	0	0	0	1	0	0
Taper Length (ft)	25			25				25		
Right Turn on Red			Yes		Yes		Yes		Yes	
Link Speed (mph)		50			50		30		30	
Link Distance (ft)		3620			1652		415		2274	
Travel Time (s)		49.4			22.5		9.4		51.7	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles (%)	1%	1%	1%	2%	2%	3%	3%	1%	1%	1%
Shared Lane Traffic (%)										
Turn Type	pm+pl	NA	Perm	Perm	NA	Perm	NA	Perm	NA	NA
Protected Phases	1	6			2		4		8	
Permitted Phases	6	6	6	2	2	4	4	8	8	8
Detector Phase	1	6	6	2	2	4	4	8	8	8
Switch Phase										
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	5.0	5.0	5.0	5.0	5.0
Minimum Spill (s)	10.5	25.5	25.5	26.5	26.5	33.5	33.5	33.5	33.5	33.5
Total Spill (s)	11.0	56.5	56.5	45.5	45.5	33.5	33.5	33.5	33.5	33.5
Total Split (%)	12.2%	62.8%	62.8%	50.6%	50.6%	37.2%	37.2%	37.2%	37.2%	37.2%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead			Lag			Lag			
Lead-Lag Optimizer?	Yes			Yes			Yes			
Recall Mode	None	Max	Max	Max	Max	None	None	None	None	None
Intersection Summary										
Area Type:	Other									
Cycle Length:	90									
Actuated Cycle Length:	76.4									
Natural Cycle:	90									
Control Type:	Actuated-Uncoordinated									

Spills and Phases: 58: Old Hwy 99 & Henderson Blvd



HCM 2010 Signalized Intersection Summary 58: Old Hwy 99 & Henderson Blvd

Projected 2022 without improvements
PM Peak Hour

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	110	865	10	2	540	115	15	5	5	150	5	60
Future Volume (veh/h)	110	865	10	2	540	115	15	5	5	150	5	60
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped Bike Adj(A_pb7)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/hln	1881	1881	1881	1863	1900	1900	1845	1900	1881	1881	1900	1900
Adj Flow Rate, veh/h	126	994	11	2	621	132	17	6	172	6	69	69
Adj No of Lanes	1	1	1	1	1	0	0	1	0	1	1	0
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh. %	1	1	1	2	2	2	3	3	3	1	1	1
Cap. veh/h	399	1332	1132	313	846	180	162	56	36	312	18	207
Arrive On Green	0.06	0.71	0.71	0.57	0.57	0.57	0.14	0.14	0.14	0.14	0.14	0.14
Sat Flow, veh/h	1792	1881	1599	558	1490	317	592	405	260	1410	129	1489
Sat Volume(V), veh/h	126	994	11	2	0	753	29	0	0	112	0	75
Grip Sat Flow(s), veh/hln	1792	1881	1599	558	0	1807	1267	0	0	1410	0	1618
Q Serve(g.s), s	1.9	23.6	0.1	0.2	0.0	22.2	0.0	0.0	0.0	4.6	0.0	3.0
Cycle Q Clear(g.c), s	1.9	23.6	0.1	13.6	0.0	22.2	3.0	0.0	0.0	7.7	0.0	3.0
Prop In Lane	1.00	1.00	1.00	1.00	0.18	0.59	0.0	0.21	1.00	0.0	0.92	0.92
Lane Cap Cap(c), veh/h	399	1332	1132	313	0	1026	254	0	0	312	0	225
V/C Ratio(X)	0.32	0.75	0.01	0.01	0.00	0.73	0.11	0.00	0.00	0.55	0.00	0.33
Avail Cap(c), veh/h	422	1332	1132	313	0	1026	614	0	0	664	0	629
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(f)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	9.4	6.5	3.1	13.8	0.0	11.5	27.1	0.0	0.0	29.8	0.0	28.0
Incr Delay (d2), s/veh	0.2	3.8	0.0	0.0	0.0	4.7	0.1	0.0	0.0	0.6	0.0	0.3
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOf(50%), veh/h	1.0	13.3	0.1	0.0	0.0	12.2	0.5	0.0	0.0	3.3	0.0	1.4
LnGrp Delay(d), s/veh	9.6	10.3	3.1	13.9	0.0	16.2	27.2	0.0	0.0	30.3	0.0	28.3
LnGrp LOS	A	B	A	B	B	C	C	C	C	C	C	C
Approach Vol, veh/h	1131	755	29	247								
Approach Delay, s/veh	10.2	16.2	27.2	29.7								
Approach LOS	B	B	C	C								
Timer	1	2	3	4	5	6	7	8				
Assigned PIs	1	2	4	6	8							
Pls Duration (G+Y+Rd), s	10.1	46.4	15.5	56.5	15.5							
Change Period (Y+Rd), s	5.5	5.5	5.5	5.5	5.5							
Max Green Setting (Gmax), s	5.5	40.0	28.0	51.0	28.0							
Max Q Clear Time (Q_c+H1), s	3.9	24.2	5.0	25.6	9.7							
Green Ext Time (Q_c), s	0.0	10.2	0.4	13.9	0.4							
Intersection Summary												
HCM 2010 Crt Delay	14.7											
HCM 2010 LOS	B											

HCM 2010 TWSC 59: Old Hwy 99 & 79th Ave

Projected 2022 without improvements
PM Peak Hour

Intersection	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Int Delay, s/veh	2.4											
Movement	1	1	10	15	0	115	115	915	0	1	460	15
Traffic Vol, veh/h	1	1	10	15	0	115	115	915	0	1	460	15
Future Vol, veh/h	1	1	10	15	0	115	115	915	0	1	460	15
Conflicting Peds. #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	300	250	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	-	0	-	-	-	-	-	-
Grade, %	-	-	-	-	-	-	-	-	-	-	-	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	1	1	1	1	1	1	1	1	1
Mvmt Flow	1	1	11	16	0	121	121	963	0	1	484	16
Major/Minor	Minor1	Minor2	Major1	Major2								
Conflicting Flow All	1699	1707	963	1705	1699	492	500	0	0	963	0	0
Stage 1	1205	1205	-	494	494	-	-	-	-	-	-	-
Stage 2	494	502	-	1211	1205	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.11	6.51	6.21	4.11	-	-	4.11	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.11	5.51	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.11	5.51	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.509	4.009	3.309	2.209	-	-	2.209	-	-
Pot Cap-1 Maneuver	73	91	310	73	93	579	1069	-	-	719	-	-
Stage 1	225	257	-	559	548	-	-	-	-	-	-	-
Stage 2	557	542	-	224	258	-	-	-	-	-	-	-
Platoon blocked, %	53	81	310	64	82	579	1069	-	-	719	-	-
Mov Cap-1 Maneuver	53	81	-	64	82	-	-	-	-	-	-	-
Mov Cap-2 Maneuver	200	228	-	496	547	-	-	-	-	-	-	-
Stage 1	440	541	-	191	229	-	-	-	-	-	-	-
Stage 2												
Approach	EB	WB	SE	NW								
HCM Control Delay, s	25.4	20.5	1	0								
HCM LOS	D	C										
Minor Lane/Minor Mvmt	NWL	NWT	NWR	EBL	EBT	EBR	SEL	SET	SER			
Capacity (veh/h)	719	-	-	189	64	579	1069	-	-			
HCM Lane V/C Ratio	0.001	-	-	0.067	0.247	0.209	0.113	-	-			
HCM Control Delay (s)	10	0	-	25.4	78.8	12.9	8.8	-	-			
HCM Lane LOS	B	A	-	D	F	B	A	-	-			
HCM 95th %ile Q(veh)	0	-	-	0.2	0.9	0.8	0.4	-	-			

HCM 2010 TWSC
60: Kimmie St & 83rd Ave

Projected 2022 without improvements
PM Peak Hour

Intersection						
Int Delay, s/veh		2.7				
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	45	15	40	15	5	115
Future Vol, veh/h	45	15	40	15	5	115
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	0	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	3	3	9	9	3	3
Mvmt Flow	55	18	49	18	6	140

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	210	58	0	0	67	0
Stage 1	58	-	-	-	-	-
Stage 2	152	-	-	-	-	-
Critical Hdwy	6.43	6.23	-	-	4.13	-
Critical Hdwy Sig 1	5.43	-	-	-	-	-
Critical Hdwy Sig 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.327	-	-	2.227	-
Pot Cap-1 Maneuver	776	1005	-	-	1528	-
Stage 1	962	-	-	-	-	-
Stage 2	874	-	-	-	-	-
Platoon blocked, %						
Mov Cap-1 Maneuver	773	1005	-	-	1528	-
Mov Cap-2 Maneuver	773	-	-	-	-	-
Stage 1	962	-	-	-	-	-
Stage 2	871	-	-	-	-	-

Approach	WB		NB		SB	
HCM Control Delay, s	9.8		0		0.3	
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBR/WBL1	SBL	SBT		
Capacity (veh/h)	-	820	1528	-		
HCM Lane V/C Ratio	-	0.089	0.004	-		
HCM Control Delay (s)	-	9.8	7.4	0		
HCM Lane LOS	-	A	A	A		
HCM 95th %ile Q(veh)	-	0.3	0	-		

HCM 2010 TWSC
61: 83rd Ave & Center St

Projected 2022 without improvements
PM Peak Hour

Intersection						
Int Delay, s/veh		8.5				
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	70	20	10	110	200	75
Future Vol, veh/h	70	20	10	110	200	75
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	0	0	-
Grade, %	-	-	0	-	-	0
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	1	1	3	3	1	1
Mvmt Flow	80	23	11	125	227	85

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	136	0	0	0	256	74
Stage 1	-	-	-	-	74	-
Stage 2	-	-	-	-	182	-
Critical Hdwy	4.11	-	-	-	6.41	6.21
Critical Hdwy Sig 1	-	-	-	-	5.41	-
Critical Hdwy Sig 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.209	-	-	-	3.509	3.309
Pot Cap-1 Maneuver	1454	-	-	-	735	990
Stage 1	-	-	-	-	951	-
Stage 2	-	-	-	-	852	-
Platoon blocked, %						
Mov Cap-1 Maneuver	1454	-	-	-	694	990
Mov Cap-2 Maneuver	-	-	-	-	694	-
Stage 1	-	-	-	-	951	-
Stage 2	-	-	-	-	804	-

Approach	EB		WB		SB	
HCM Control Delay, s	5.9		0		13.1	
HCM LOS					B	
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR/SBL1		
Capacity (veh/h)	1454	-	-	756		
HCM Lane V/C Ratio	0.055	-	-	0.413		
HCM Control Delay (s)	7.6	0	-	13.1		
HCM Lane LOS	A	A	-	B		
HCM 95th %ile Q(veh)	0.2	-	-	2		

Lanes, Volumes, Timings Projected 2022 without improvements PM Peak Hour

62: 88th Ave & Old Hwy 99

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	0	785	220	10	310	0	205	10	25	2	5	1
Future Volume (vph)	0	785	220	10	310	0	205	10	25	2	5	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100	150	150	150	150	0	150	0	0	0	0	0
Storage Lanes	1	1	1	1	1	0	1	0	0	0	0	0
Taper Length (ft)	25			25			25			25		
Right Turn on Red		Yes			Yes			Yes			Yes	
Link Speed (mph)	50			50			30			30		
Link Distance (ft)	3849			1410			1160			265		
Travel Time (s)	52.5			19.2			26.4			6.0		
Peak Hour Factor	0.92	0.90	0.90	0.90	0.92	0.90	0.92	0.90	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	1%	1%	1%	1%	2%	3%	2%	3%	2%	2%	2%
Shared Lane Traffic (%)												
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA	Perm	NA	NA
Permitted Phases	6	6			2		4		4	8		8
Detector Phase	6	6	6	2	2		4		4	8		8
Switch Phase												
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0		6.0		6.0	6.0		6.0
Minimum Spill (s)	26.0	26.0	26.0	26.0	26.0		24.0		24.0	26.0		26.0
Total Split (s)	34.0	34.0	34.0	34.0	34.0		26.0		26.0	26.0		26.0
Total Split (%)	56.7%	56.7%	56.7%	56.7%	56.7%		43.3%		43.3%	43.3%		43.3%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0		3.0		3.0	3.0		3.0
All-red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0		1.0	1.0		1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0		0.0	0.0		0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0		4.0		4.0	4.0		4.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Max	Max	Max	Max	Max		None		None	None		None
Intersection Summary												
Area Type:	Other											
Cycle Length:	60											
Actuated Cycle Length:	56.1											
Natural Cycle:	65											
Control Type:	Actuated-Uncoordinated											

Splits and Phases: 62: 88th Ave & Old Hwy 99

62	64
34 s	26 s
06	08
34 s	26 s

HCM 2010 Signalized Intersection Summary Projected 2022 without improvements PM Peak Hour

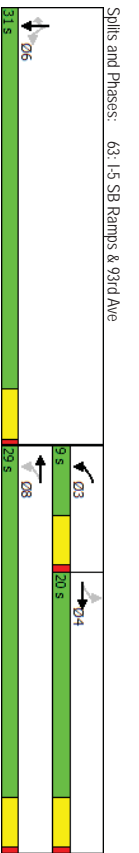
62: 88th Ave & Old Hwy 99

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	0	785	220	10	310	0	205	10	25	2	5	1
Future Volume (veh/h)	0	785	220	10	310	0	205	10	25	2	5	1
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Ob.) veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped Bike Adj (A _{pb})	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/hln	1863	1881	1881	1881	1881	1845	1850	1900	1863	1900	1863	1900
Adj Flow Rate, veh/h	0	872	244	11	344	0	228	11	28	2	5	1
Adj No of Lanes	1	1	1	1	1	0	1	1	0	0	1	0
Peak Hour Factor	0.92	0.90	0.90	0.90	0.92	0.90	0.92	0.90	0.92	0.92	0.92	0.92
Percent Heavy Veh. %	2	1	1	1	1	3	2	2	2	2	2	2
Cap. veh/h	150	1100	925	265	1100	0	438	95	243	140	268	45
Arrive On Green	0.00	0.58	0.58	0.58	0.58	0.00	0.21	0.21	0.21	0.21	0.21	0.21
Sat Flow, veh/h	1032	1881	1599	508	1881	0	1391	463	1179	225	1299	218
Gp Volume(v), veh/h	0	872	244	11	344	0	228	0	39	8	0	0
Gp Sat Flow(s), veh/hln	1032	1881	1599	508	1881	0	1391	0	1642	1742	0	0
Q Serve(g.s), s	0.0	17.2	3.6	0.8	4.4	0.0	7.2	0.0	0.9	0.0	0.0	0.0
Cycle Q Clear(g.c), s	0.0	17.2	3.6	18.0	4.4	0.0	7.4	0.0	0.9	0.2	0.0	0.0
Prop In Lane	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.72	0.25	0.12	0.12	0.12
Lane Gp Cap(c), veh/h	150	1100	925	265	1100	0	438	0	339	453	0	0
V/C Ratio(X)	0.00	0.79	0.26	0.04	0.31	0.00	0.52	0.00	0.12	0.02	0.00	0.00
Avail Cap(C _a), veh/h	150	1100	925	265	1100	0	791	0	754	877	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(f)	0.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	7.7	4.9	14.7	5.0	0.0	18.0	0.0	15.4	15.1	0.0	0.0
Incr Delay (d ₂), s/veh	0.0	5.9	0.7	0.3	0.7	0.0	1.0	0.0	0.1	0.0	0.0	0.0
Initial Q Delay(d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackQ(50%), veh/h	0.0	10.5	1.7	0.1	2.5	0.0	3.0	0.0	0.4	0.1	0.0	0.0
LnGrp Delay(d), s/veh	0.0	13.6	5.5	14.9	5.8	0.0	19.0	0.0	15.6	15.2	0.0	0.0
LnGrp LOS		B	A	B	A		B		B	B		
Approach Vol, veh/h	1116											
Approach Delay, s/veh	11.8											
Approach LOS	B											
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	2			4		6		8				
Phs Duration (G+Y+Rc), s	34.0			13.9		34.0		13.9				
Change Period (Y+Rc), s	6.0			4.0		6.0		4.0				
Max Green Setting (G _{max}), s	200			22.0		28.0		22.0				
Max Q Clear Time (q _c +t1), s	200			9.4		19.2		2.2				
Green Ext Time (p.c.), s	4.9			0.7		5.3		0.9				
Intersection Summary												
HCM 2010 Ctrl Delay	11.7											
HCM 2010 LOS	B											

Lanes, Volumes, Timings
63: I-5 SB Ramps & 93rd Ave

Projected 2022 without improvements
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	325	45	130	180	0	0	0	0	520	0	315
Future Volume (vph)	0	325	45	130	180	0	0	0	0	520	0	315
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0	150	0	0	0	0	0	0	0	300
Storage Lanes	0	0	0	1	0	0	0	0	0	0	0	1
Taper Length (ft)	25			25			25			25		
Right Turn on Red		Yes			Yes			Yes			Yes	
Link Speed (mph)		30			40			30			30	
Link Distance (ft)		1124			936			1099			1644	
Travel Time (s)		25.5			16.0			25.0			37.4	
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 (%)	1%	1%	1%	9%	9%	9%	0%	0%	0%	4%	4%	4%
Shared Lane Traffic (%)		NA		pm+pt	NA					NA	NA	NA
Turn Type		Protected		3	8					Perm	NA	Perm
Permitted Phases		4		8						6		6
Detector Phase	4		4	3		8				6		6
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0			4.0	4.0	4.0	4.0	4.0
Minimum Spill (s)	20.0	20.0		8.0	20.0			20.0	20.0	20.0	20.0	20.0
Total Split (s)	20.0	20.0		9.0	29.0			31.0	31.0	31.0	31.0	31.0
Total Split (%)	33.3%	33.3%		15.0%	48.3%			51.7%	51.7%	51.7%	51.7%	51.7%
Yellow Time (s)	3.5	3.5		3.5	3.5			3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5		0.5	0.5			0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0		4.0	4.0			4.0	4.0	4.0	4.0	4.0
Lead/Lag		Lag			Lead							
Lead-Lag Optimize?	Yes	Yes		Yes								
Recall Mode	None	None		None						Max	Max	Max



HCM 2010 Signalized Intersection Summary
63: I-5 SB Ramps & 93rd Ave

Projected 2022 without improvements
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	325	45	130	180	0	0	0	0	520	0	315
Future Volume (veh/h)	0	325	45	130	180	0	0	0	0	520	0	315
Number	7	4	14	3	8	18	0	0	0	1	6	16
Initial Q (Qb) veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped Bike Adj(A_pbT)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/hln	1900	1881	1900	1743	1743	0	1881	1900	1827	1827	1827	1827
Adj Flow Rate, veh/h	0	369	51	148	205	0	1	0	0	591	0	165
Adj No. of Lanes	0	1	1	1	1	0	1	0	0	1	0	1
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
Percent Heavy Veh. %	1	1	1	1	9	0	1	4	4	4	4	4
Cap. veh/h	0	420	58	297	716	0	791	0	706	791	0	706
Arrive On Green	0.00	0.26	0.26	0.08	0.41	0.00	0.45	0.00	0.45	0.00	0.45	0.45
Sat Flow, veh/h	0	1618	224	1660	1743	0	1740	0	1553	1740	0	1553
Gp Volume(v), veh/h	0	0	420	148	205	0	591	0	165	791	0	165
Gp Sat Flow(s), veh/hln	0	0	1882	1660	1743	0	1740	0	1553	1740	0	1553
Q Serve(g), s	0.0	0.0	13.0	3.6	4.7	0.0	16.7	0.0	3.9	16.7	0.0	3.9
Cycle Q Clear(g-c), s	0.0	0.0	13.0	3.6	4.7	0.0	16.7	0.0	3.9	16.7	0.0	3.9
Prop In Lane	0.00	0.12	1.00	0.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00
Lane Gp Cap(c), veh/h	0	0	478	297	716	0	791	0	706	791	0	706
V/C Ratio(X)	0.00	0.00	0.88	0.50	0.29	0.00	0.75	0.00	0.23	0.75	0.00	0.23
Avail Cap(C-a), veh/h	0	0	496	297	734	0	791	0	706	791	0	706
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(f)	0.00	0.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	21.1	14.9	11.7	0.0	13.4	0.0	9.9	13.4	0.0	9.9
Incr Delay (d2), s/veh	0.0	0.0	16.1	1.3	0.2	0.0	6.4	0.0	0.8	6.4	0.0	0.8
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackQ(50%),veh/hln	0.0	0.0	8.7	1.8	2.3	0.0	9.3	0.0	1.8	9.3	0.0	1.8
LnGrp Delay(d), s/veh	0.0	0.0	37.2	16.2	11.9	0.0	19.8	0.0	10.7	19.8	0.0	10.7
LnGrp LOS			D	B	B		B		B	B		B
Approach Vol, veh/h		420			353			756				
Approach Delay, s/veh		37.2			13.7			17.8				
Approach LOS		D			B			B				
Timer	1	2	3	4	5	6	7	8				
Assigned Pks		3		4		6		8				
Pks Duration (G+Y+Rc), s		9.0		19.4		31.0		28.4				
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0				
Max Green Setting (Gmax), s		5.0		16.0		27.0		25.0				
Max Q Clear Time (q_c+1), s		5.6		15.0		18.7		6.7				
Green Ext Time (p_c), s		0.0		0.4		3.0		3.6				

HCM 2010 TWSC
64: I-5 NB Ramps & 93rd Ave

Projected 2022 without improvements
PM Peak Hour

Intersection													
Int Delay, s/veh													
3.1													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Traffic Vol, veh/h	260	540	0	0	270	370	70	0	125	0	0	0	
Future Vol, veh/h	260	540	0	0	270	370	70	0	125	0	0	0	
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	-	-	Yield	-	-	Yield	-	-	None	
Storage Length	125	-	-	-	-	300	-	-	-	-	-	-	
Vel 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, %	3	3	3	8	8	8	14	14	14	0	0	0	
Mvmt Flow	277	574	0	0	287	394	74	0	133	0	0	0	

Major/Minor	Major1	Major2			Minor1		
Conflicting Flow All	287	0	-	-	0	1415	1415
Stage 1	-	-	-	-	-	1128	1128
Stage 2	-	-	-	-	-	287	287
Critical Hdwy	4.13	-	-	-	-	6.54	6.64
Critical Hdwy Sig 1	-	-	-	-	-	5.54	5.64
Critical Hdwy Sig 2	-	-	-	-	-	5.54	5.64
Follow-up Hdwy	2.227	-	-	-	-	3.626	4.126
Pot Cap-1 Maneuver	1269	-	0	-	-	142	130
Stage 1	-	0	0	-	-	293	266
Stage 2	-	0	0	-	-	735	653
Platoon blocked, %	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1269	-	-	-	-	111	0
Mov Cap-2 Maneuver	-	-	-	-	-	111	0
Stage 1	-	-	-	-	-	229	0
Stage 2	-	-	-	-	-	735	0

Approach	EB	WB			NB		
HCM Control Delay, s	2.8	-	-	0	-	14.4	-
HCM LOS	B	-	-	-	-	B	-
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBL	WBR		
Capacity (veh/h)	590	1269	-	-	-	-	-
HCM Lane V/C Ratio	0.352	0.218	-	-	-	-	-
HCM Control Delay (s)	14.4	8.6	-	-	-	-	-
HCM Lane LOS	B	A	-	-	-	-	-
HCM 95th %ile Q(veh)	1.6	0.8	-	-	-	-	-

HCM 2010 TWSC
65: Kimmie St & 93rd Ave

Projected 2022 without improvements
PM Peak Hour

Intersection													
Int Delay, s/veh													
2.4													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Traffic Vol, veh/h	35	500	15	5	435	10	15	2	10	20	5	70	
Future Vol, veh/h	35	500	15	5	435	10	15	2	10	20	5	70	
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	-	-	-	-	-	-	-	-	-	-	-	-	
Vel 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, %	4	4	4	1	1	1	0	0	0	5	5	5	
Mvmt Flow	37	532	16	5	463	11	16	2	11	21	5	74	

Major/Minor	Major1	Major2			Minor1		
Conflicting Flow All	473	0	0	548	0	0	1133
Stage 1	-	-	-	-	-	-	619
Stage 2	-	-	-	-	-	-	484
Critical Hdwy	4.14	-	-	4.11	-	-	7.1
Critical Hdwy Sig 1	-	-	-	-	-	-	6.1
Critical Hdwy Sig 2	-	-	-	-	-	-	5.5
Follow-up Hdwy	2.236	-	-	2.209	-	-	6.1
Pot Cap-1 Maneuver	1079	-	-	1027	-	-	3.5
Stage 1	-	-	-	-	-	-	215
Stage 2	-	-	-	-	-	-	546
Platoon blocked, %	-	-	-	-	-	-	182
Mov Cap-1 Maneuver	1079	-	-	1027	-	-	486
Mov Cap-2 Maneuver	-	-	-	-	-	-	544
Stage 1	-	-	-	-	-	-	555
Stage 2	-	-	-	-	-	-	470
Mov Cap-1 Maneuver	1079	-	-	1027	-	-	149
Mov Cap-2 Maneuver	-	-	-	-	-	-	203
Stage 1	-	-	-	-	-	-	459
Stage 2	-	-	-	-	-	-	462

Approach	EB	WB			NB		
HCM Control Delay, s	0.5	-	-	0.1	-	24.8	-
HCM LOS	C	-	-	-	-	C	-
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR
Capacity (veh/h)	210	1079	-	-	1027	-	367
HCM Lane V/C Ratio	0.137	0.035	-	-	0.005	-	0.275
HCM Control Delay (s)	24.8	8.5	0	-	8.5	0	18.5
HCM Lane LOS	C	A	A	-	A	A	C
HCM 95th %ile Q(veh)	0.5	0.1	-	-	0	-	1.1

HCM 2010 AWSC
66: Case Rd & 93rd Ave

Projected 2022 without improvements
P/M Peak Hour

PM Peak Hour

Intersection													
Intersection Delay s/Veh													
Intersection LOS													
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NEU	NEL	NET	NER	
Traffic Vol, veh/h	0	2	370	165	0	105	320	45	0	85	20	35	
Future Vol, veh/h	0	2	370	165	0	105	320	45	0	85	20	35	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Heavy Vehicles, %	2	3	3	3	2	2	2	2	2	0	0	0	
Minrt Flow	0	2	402	179	0	114	348	49	0	92	22	38	
Number of Lanes	0	0	1	0	0	0	1	1	0	0	1	0	

Approach	EB	WB	NE
Opposing Approach	WB	WB	NE
Opposing Lanes	2	1	1
Conflicting Approach Left	SW	NE	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NE	SW	WB
Conflicting Lanes Right	1	1	2
HCM Control Delay	61	39.1	14.7
HCM LOS	F	E	B

Lane	NE Ln1	EB Ln1	WB Ln1	SW Ln1
Vol Left, %	61%	0%	25%	0%
Vol Thru, %	14%	69%	75%	0%
Vol Right, %	25%	31%	0%	100%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	140	537	425	45
LT Vol	85	2	105	0
Through Vol	20	370	320	0
RT Vol	35	165	0	45
Lane Flow Rate	152	584	462	49
Geometry GIP	2	5	7	7
Geometry GIP (X)	0.331	0.995	0.883	0.082
Departure Headway (Hd)	7.824	6.139	6.98	6.137
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	461	584	522	587
Service Time	5.837	4.237	4.68	3.837
HCM Lane V/C Ratio	0.33	1	0.885	0.083
HCM Control Delay	14.7	61	42.2	9.4
HCM Lane LOS	B	F	E	A
HCM 95thile Q	1.4	14.5	9.8	0.3

HCM 2010 AWSC
66: Case Rd & 93rd Ave

Projected 2022 without improvements
PM Peak Hour

PM Peak Hour

Intersection				
Intersection Delay, s/veh				
Intersection LOS				
Movement	SWU	SWL	SWT	SWR
Traffic Vol, veh/h	0	95	50	1
Future Vol, veh/h	0	95	50	1
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	1	1	1
Avnrt Flow	0	103	54	1
Number of Lanes	0	0	1	0

Approach	SW
Opposing Approach	NE
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	15.2
HCM LOS	C
lane	

HCM 2010 AWSC
67: Tilley Rd (South) & 93rd Ave

Projected 2022 without improvements
PM Peak Hour

Intersection										
Intersection Delay, s/vch	24.6									
Intersection LOS	C									
Movement	EBU	EBT	EBR	WBU	WBL	WBT	NBU	NBL	NR	NR
Traffic Vol, veh/h	0	305	190	0	100	315	0	145	70	70
Future Vol, veh/h	0	305	190	0	100	315	0	145	70	70
Peak Hour Factor	0.92	0.87	0.87	0.92	0.87	0.87	0.92	0.87	0.87	0.87
Heavy Vehicles, %	2	3	3	2	2	2	2	1	1	1
Mvmt Flow	0	351	218	0	115	362	0	167	80	80
Number of Lanes	0	1	0	0	0	1	0	1	0	0
Approach	EB	WB	WB	EB	NB	NB	EB	WB	NB	NB
Opposing Approach	WB	EB	WB	EB	WB	EB	WB	EB	WB	WB
Opposing Lanes	1	1	1	1	1	1	1	1	1	1
Conflicting Approach Left	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Conflicting Lanes Left	0	0	1	1	1	1	1	1	1	1
Conflicting Approach Right	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Conflicting Lanes Right	1	1	0	0	1	1	1	1	1	1
HCM Control Delay	29.6	23.7	23.7	23.7	14.6	14.6	29.6	23.7	23.7	23.7
HCM LOS	D	C	C	C	B	B	D	C	C	C
Lane	NBLn1	EBLn1	WBLn1	EBLn1	WBLn1	EBLn1	WBLn1	EBLn1	WBLn1	EBLn1
Vol Left, %	67%	0%	24%	67%	0%	24%	67%	0%	24%	67%
Vol Thru, %	0%	62%	76%	0%	62%	76%	0%	62%	76%	0%
Vol Right, %	33%	38%	0%	33%	38%	0%	33%	38%	0%	33%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	215	495	415	215	495	415	215	495	415	215
LT Vol	0	305	315	0	305	315	0	305	315	0
Through Vol	70	190	0	70	190	0	70	190	0	70
RT Vol	247	569	417	247	569	417	247	569	417	247
Lane Flow Rate	1	1	1	1	1	1	1	1	1	1
Geometry Grp	0.442	0.836	0.748	0.442	0.836	0.748	0.442	0.836	0.748	0.442
Degree of Util (X)	6.442	5.289	5.642	6.442	5.289	5.642	6.442	5.289	5.642	6.442
Departure Headway (Hd)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	556	683	639	556	683	639	556	683	639	556
Service Time	4.522	3.353	3.709	4.522	3.353	3.709	4.522	3.353	3.709	4.522
HCM Lane V/C Ratio	0.444	0.833	0.746	0.444	0.833	0.746	0.444	0.833	0.746	0.444
HCM Control Delay	14.6	29.6	23.7	14.6	29.6	23.7	14.6	29.6	23.7	14.6
HCM Lane LOS	B	D	C	B	D	C	B	D	C	B
HCM 95th-ile Q	2.2	9.2	6.7	2.2	9.2	6.7	2.2	9.2	6.7	2.2

HCM 2010 TWSC
68: 93rd Ave & Tilley Rd (North)

Projected 2022 without improvements
PM Peak Hour

Intersection										
Int Delay s/vch	5.1									
Movement	EBL	EBT	WBL	WBR	SBL	SBR	EBL	EBT	WBL	WBR
Traffic Vol, veh/h	110	260	175	20	35	240	110	260	175	20
Future Vol, veh/h	110	260	175	20	35	240	110	260	175	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None	-	None	-	None
Storage Length	-	-	-	-	250	-	-	-	-	-
Veh in Median Storage, #	-	0	0	0	0	0	-	0	0	0
Grade, %	-	0	0	0	0	0	-	0	0	0
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	2	2	3	3	1	1	2	2	3	3
Mvmt Flow	128	302	203	23	41	279	128	302	203	23
Major/Minor	Major1	Major2	Minor2	Major1	Minor2	Major1	Major2	Minor2	Major1	Minor2
Conflicting Flow All	227	0	773	227	0	773	227	0	773	227
Stage 1	-	-	215	-	-	215	-	-	215	-
Stage 2	-	-	558	-	-	558	-	-	558	-
Critical Hdwy	4.12	-	6.41	-	-	6.21	4.12	-	6.41	-
Critical Hdwy Sig 1	-	-	5.41	-	-	5.41	-	-	5.41	-
Critical Hdwy Sig 2	-	-	3.509	-	-	3.309	-	-	3.509	-
Follow-up Hdwy	2.218	-	3.69	-	-	827	2.218	-	3.69	-
Pot Cap-1 Maneuver	1341	-	823	-	-	827	1341	-	823	-
Stage 1	-	-	575	-	-	827	-	-	575	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1341	-	327	-	-	827	1341	-	327	-
Mov Cap-2 Maneuver	-	-	327	-	-	827	-	-	327	-
Stage 1	-	-	509	-	-	827	-	-	509	-
Stage 2	-	-	-	-	-	-	-	-	-	-
Approach	EB	WB	SB	EB	WB	SB	EB	WB	SB	EB
HCM Control Delay, s	2.4	0	12.4	2.4	0	12.4	2.4	0	12.4	2.4
HCM LOS	B	B	B	B	B	B	B	B	B	B
Minor Lane/Minor Mvmt	EBL	EBT	WBL	WBR	SBLn1	SBLn2	EBL	EBT	WBL	WBR
Capacity (veh/h)	1341	-	-	-	327	827	1341	-	-	-
HCM Lane V/C Ratio	0.095	-	-	-	0.124	0.337	0.095	-	-	-
HCM Control Delay (s)	8	0	-	-	17.6	11.6	8	0	-	-
HCM Lane LOS	A	A	-	-	C	B	A	A	-	-
HCM 95th %ile Q(veh)	0.3	-	-	-	0.4	1.5	0.3	-	-	-

HCM 2010 TWSC
69: 93rd Ave & Old Hwy 99

Projected 2022 without improvements
PM Peak Hour

Intersection									
In Delay, s/veh		4							
Movement	EBT	EBR	WBL	WBT	NEL	NER			
Traffic Vol, veh/h	675	30	115	230	15	175			
Future Vol, veh/h	675	30	115	230	15	175			
Conflicting Peds, #/hr	0	0	0	0	0	0			
Sign Control	Free	Free	Free	Free	Stop	Stop			
RT Channelized	-	None	-	None	-	None			
Storage Length	-	450	300	-	300	0			
Veh in Median Storage, #	0	-	0	-	2	-			
Grade, %	0	-	-	-	0	-			
Peak Hour Factor	92	92	92	92	92	92			
Heavy Vehicles, %	1	1	2	2	1	1			
Mvmt Flow	734	33	125	250	16	190			
Major/Minor	Major1		Major2		Minor1				
Conflicting Flow All	0	0	734	0	1234	734			
Stage 1	-	-	-	-	734	-			
Stage 2	-	-	-	-	500	-			
Critical Hdwy	-	-	4.12	-	6.41	6.21			
Critical Hdwy Sig 1	-	-	-	-	5.41	-			
Critical Hdwy Sig 2	-	-	-	-	5.41	-			
Follow-up Hdwy	-	-	2.218	-	3.509	3.309			
Poi Cap-1 Maneuver	-	-	871	-	196	422			
Stage 1	-	-	-	-	477	-			
Stage 2	-	-	-	-	611	-			
Platoon blocked, %	-	-	-	-	-	-			
Mov Cap-1 Maneuver	-	-	871	-	168	422			
Mov Cap-2 Maneuver	-	-	-	-	368	-			
Stage 1	-	-	-	-	477	-			
Stage 2	-	-	-	-	523	-			
Approach	EB		WB		NE				
HCM Control Delay, s	0		3.3		19.9				
HCM LOS					C				
Minor Lane/Major Mvmt	NELn1	NELn2	EBT	EBR	WBL	WBT			
Capacity (veh/h)	368	422	-	-	871	-			
HCM Lane V/C Ratio	0.044	0.451	-	-	0.144	-			
HCM Control Delay (s)	15.2	20.3	-	-	9.8	-			
HCM Lane LOS	C	C	-	-	A	-			
HCM 95th %ile Q(veh)	0.1	2.3	-	-	0.5	-			

B. ANALYSIS OF NON-MOTORIZED NETWORK

This was prepared as background for the non-motorized network

Tumwater Non-Motorized LOS Framework

The purpose of this white paper is to describe the draft Non-Motorized LOS Framework for the City of Tumwater as part of the Transportation Master Plan. This framework is intended to provide the structure, policies, and goals that would be associated with the Non-Motorized LOS standards. Specific details regarding non-motorized facility design standards are not the focus of this framework as those details should be identified in the City's street design standards or as part of a separate Non-Motorized Plan. However, examples of specific facility designs may be discussed to explain concepts. It is anticipated that text and concepts described in this white paper may be used in some manner in the Transportation Master Plan.

First the framework concepts and structure will be discussed, which define the terms being used in the Non-Motorized LOS Framework and highlight how different pieces of the policy fit together. Next the resulting framework for Non-Motorized LOS Standards is presented. Finally, a needs based assessment was conducted using the framework.

1. Concept and Structure for LOS Framework

The first important concepts are "Quality of Service" and "Level of Service" as defined below:

- **Quality of Service (QOS)** describes how well a facility operates from the traveler's perspective.
- **Level of Service (LOS)** is a quantitative stratification of one or more performance measures that represent quality of service.

For example, let us consider the traditional auto-based LOS framework. Drivers expect that a good transportation network means that they can *conveniently* get where they want to go. The QOS goal relates "convenience" to "congestion". A more technical performance metric for "congestion" is "vehicle delay". The traditional auto-based LOS system is stratified into six categories of "vehicle delay" ranging from A to F. Communities set LOS standards (A to F) according to what they consider an acceptable level of "congestion" (in other words, the LOS standard is meant to meet a QOS goal). If portions of the transportation network fall below acceptable LOS standards, then local agencies (and developers) build improvement projects to return the system to an acceptable level of "congestion" goal.

For non-motorized transportation systems, the QOS goals are broadened to capture different traveler expectations. Walkers and bicyclists expect that a good transportation network means that they can *comfortably* and *conveniently* get where they want to go. For vehicles the QOS goal relates to congestion, but for non-motorized transportation systems the QOS goal relates to the following:

- **Comfort.** Sense of safety, street conditions, or wayfinding
- **Completeness.** Continuity, extent, or duration
- **Connectivity.** Land use, route choice, or linkages
- **Convenience.** Distance, destinations, or choices

Transportation Master Plan Network

The City of Tumwater Transportation Master Plan (or similar document) identifies the ultimate network of pedestrian and bicycle facilities throughout the City. A hierarchy of pedestrian routes and bicycle routes are developed based on route continuity, connectivity to community destinations, and convenient locations. Table 1 defines the hierarchy of the Master Plan, which includes Primary Routes and Secondary Routes. This hierarchy and Master Plan network addresses the QOS goals related to completeness, connectivity, and convenience.

Table 1: Framework for the Transportation Master Plan Hierarchy of Pedestrian and Bicycle Routes

Hierarchy Level	Description	Relationship to Street Functional Classification
Primary Route	Primary routes provide the backbone of the non-motorized system. They provide network continuity throughout the city and link to major community destinations. On these routes, the pedestrian and bicycle modes are considered <u>equal or higher priority</u> than vehicle travel modes. Multi-use pathways are typically primary routes.	Primary routes are typically along city arterials and collector streets because the street corridors provide the continuity and connectivity. However, primary routes may be on parallel streets or pathways if the available, especially if the arterial street is prioritized for auto travel.
Secondary Route	Secondary routes support the primary route network, but are not considered as critical. On these routes, the pedestrian and bicycle modes are considered <u>equal or lower priority</u> than vehicle travel modes.	Secondary routes are typically along city arterials and collector streets because the street corridors provide the continuity and connectivity. These are routes where non-motorized activity is expected but the street is prioritized for auto traffic modes or where primary route facilities are not needed and/or feasible.
Other Streets or Paths	These are anything not classified primary or secondary routes. These are other routes not considered critical for citywide plans and projects. Non-motorized facilities would be provided based on the City's design standards.	These are typically on local streets but may also be on arterials and collectors where non-motorized travel is not expected or desired.

The Transportation Master Plan identifies the low-stress pedestrian and bicycle facilities for the streets and pathways in the non-motorized system. For transportation professionals, “low-stress” or “traveler stress” is the more technical performance metric for “comfortable”. Traveler stress takes into account the facility design, vehicle volumes and speeds on adjacent streets, and topography. In addition, special

areas or districts may be identified for geographic areas to indicate where different levels of stress are acceptable.

The Non-Motorized LOS framework relies on a Transportation Master Plan that identifies the network, the facilities, and the areas to address the QOS goals.

Project-Focused Outcomes

In practice, LOS standards are used by local governments to understand where transportation projects are needed. LOS standards reflect community QOS goals, and when the standards are not met, the community expects that improvement be made over time to bring the facility within standards. Table 2 illustrates how QOS, traveler expectations, and project identification relate.

As shown in Table 2, projects are expected in areas where the QOS is considered “POOR” because people cannot get to desirable destinations in a safe or convenient manner. “POOR” facilities would be the highest priority for project improvements and “ACCEPTABLE” facilities would be lower priority. “GOOD” facilities match the Master Plan expectations for the area.

Table 2: Framework for Non-Motorized Quality of Service

Quality of Service	Traveler Expectations	Project Identification
“GOOD”	People can safely, comfortably, and conveniently get where they want to go	“GOOD” a realistic goal for every primary non-motorized facility. No project is needed if traveler stress is low.
“ACCEPTABLE”	People can safely get where they want to go, but may not be comfortable or convenient.	“ACCEPTABLE” are facilities that are transitioning from “POOR” to “GOOD” and are lower priority areas for new project, in general.
“POOR”	People cannot safely or conveniently get where they want to go.	“POOR” represent major gaps in the primary routes and highlight the highest priorities for non-motorized projects, in general.

2. Framework for LOS Standard

The framework for the LOS standards needs both a table of LOS definitions, and the LOS standards that would be applied. Table 3 shows the LOS definitions, the quantitative stratification of the non-motorized performance metric “traveler stress”. The stratification of LOS can take a form of a letter grade (from A to F) but for Non-Motorized LOS it can be simplified to Green, Yellow, or Red scale.

Table 3: Level of Service Definitions

Level of Service	Traveler Stress	Description
"GREEN"	Low	LOS GREEN reflects where traveler stress is low and meets community expectations for that area (complies with the Transportation Master Plan). Areas with higher traffic volumes and speeds typically require greater protection for the non-motorized modes.
"YELLOW"	Moderate	LOS YELLOW reflects where traveler stress is moderate and may or may not meet community expectations for that area. There are non-motorized facilities provided, but not enough to reach low-stress levels.
"RED"	High	LOS RED reflects where traveler stress is high and does not meet community expectations for that area. These are areas where non-motorized modes are not separated from higher volume and speed traffic.

The defined LOS Standards for the City of Tumwater would be segmented by geographic areas. The "Urban Corridor District" would have more rigid design standards, whereas the "Practical Design District" would have more flexible design standards.

The LOS Standards are set at:

- LOS GREEN for primary and secondary routes in the Urban Corridor District.
- LOS GREEN for primary routes in the Practical Design District
- LOS YELLOW for secondary routes in the Practical Design District

For facilities not classified as primary or secondary routes, there would be no set LOS Standard.

Implementation and Development Review

Implementation of this framework would require further specific details surrounding stress levels: What are the traffic volume thresholds? What are the traffic speed thresholds? How much does the city want to account for topology? What type and design of facilities does the City want? We have provided a draft set of recommendations in Section 3 that could be incorporated into the Transportation Master Plan.

For Development Reviews the Non-Motorized LOS standard would apply to site frontages. For SEPA analysis, the most direct route between the development site to the nearest transit stop, school, and community center (within a certain distance) would be disclosed. These points would be identified by the City on an official map. If the route includes sections that fail the City's LOS standard, the developer may be required to mitigate at the City's discretion according to SEPA guidelines.

City-Wide Monitoring and Concurrency

Concurrency may be monitored in a similar manner. Most communities use two types of concurrency programs. One is a planning-based program to understand if communities are progressing toward their goals and being concurrent with the associated growth. The other is a regulatory-based program that can limit future development if LOS standards along specific corridors are not being achieved. This framework follows a planning-based program approach that monitors completion of the non-motorized system citywide.

Regular monitoring of the Non-Motorized System on a City-wide basis would track metrics associated with percent complete as shown in Table 4. This could be tracked separately for pedestrian and bicycle systems, or combined. The “Existing Year” documents the current state of the network. The “Future Goal” is the Transportation Master Plan conditions that are constrained by the projects that are possible in the next 20 years. The “Study Year” would be the future year that would be evaluated to see if the Percent Complete results are on target to reach the “Future Goal.”

Table 4: Monitoring the Non-Motorized System

Mode	Hierarchy Level	Percent Complete (Centerline Miles at LOS GREEN and YELLOW)		
		Existing Year	Study Year ¹	Future Goal ²
Pedestrian	Primary Route	33%	TBD	TBD
	Secondary Route	36%	TBD	TBD
Bicycle	Primary Route	45%	TBD	TBD
	Secondary Route	27%	TBD	TBD

¹ Study Year percentages to completed with final Transportation Element project list.

² Future Goal to be set evaluated and set at a later date.

3. Needs Analysis

This section highlights how the Non-Motorized LOS Framework was applied to existing conditions. Because the framework would benefit from information contained in a Non-Motorized Master Plan, some specific details about the City non-motorized system have been developed that are for discussion purposes only or may be refined into formalized definitions at a later date. The pedestrian and bicycle facilities that are present in Tumwater are first described, followed by an analysis of existing and future non-motorized needs.

Pedestrian Facilities

Every trip begins or ends with walking. Walking promotes physical activity among residents and provides connections among destinations that include shopping areas, parking lots, and recreational trips within parks and open space. A combination of walkways, sidewalks, and off-street pathways provides the core network for pedestrians.

The following types of pedestrian facilities are present in the City of Tumwater:

- **Attached Sidewalks** are the primary pedestrian facility within downtowns and developed areas. Sidewalks are directly adjacent to the curb or roadway edge and vary in width and quality. They are generally 5 feet wide. There are currently over 65 miles of attached sidewalks in the City of Tumwater.
- **Buffered Sidewalks** (Sidewalks with Planters) include a landscaped area or buffer between the roadway and sidewalk. This buffer area may also include hardscape elements where landscape planters may not be feasible or desirable. These facilities provide additional separation from traveling or parked vehicles and are generally more comfortable for pedestrians. The sidewalks are generally 5 feet wide, with a buffer distance of 4 feet. There are approximately 37 miles of sidewalks with planters in the City limits.
- **Pedestrian Pathways** traverse open areas and are typically paved. Pedestrian walkways are short segments that are used to provide more direct connections between land uses and other types of pedestrian facilities. They are generally an 8-foot wide public space with 5-foot wide paved area. They are typically not designed for bicycle use. There are approximately 2.6 miles of pedestrian walkways in the City of Tumwater.
- **Multiuse Pathways** are longer connections that include paved and unpaved trails that are designed for both pedestrians and bicyclists. These facilities are generally used for recreational purposes, but may also serve commuter and utility travel between neighborhoods and to surrounding areas.

The existing pedestrian facilities in Tumwater are shown in Figure 1. Some cities consider wide shoulders to be pedestrian facilities as well.



City of Tumwater Transportation Element

FIGURE

1

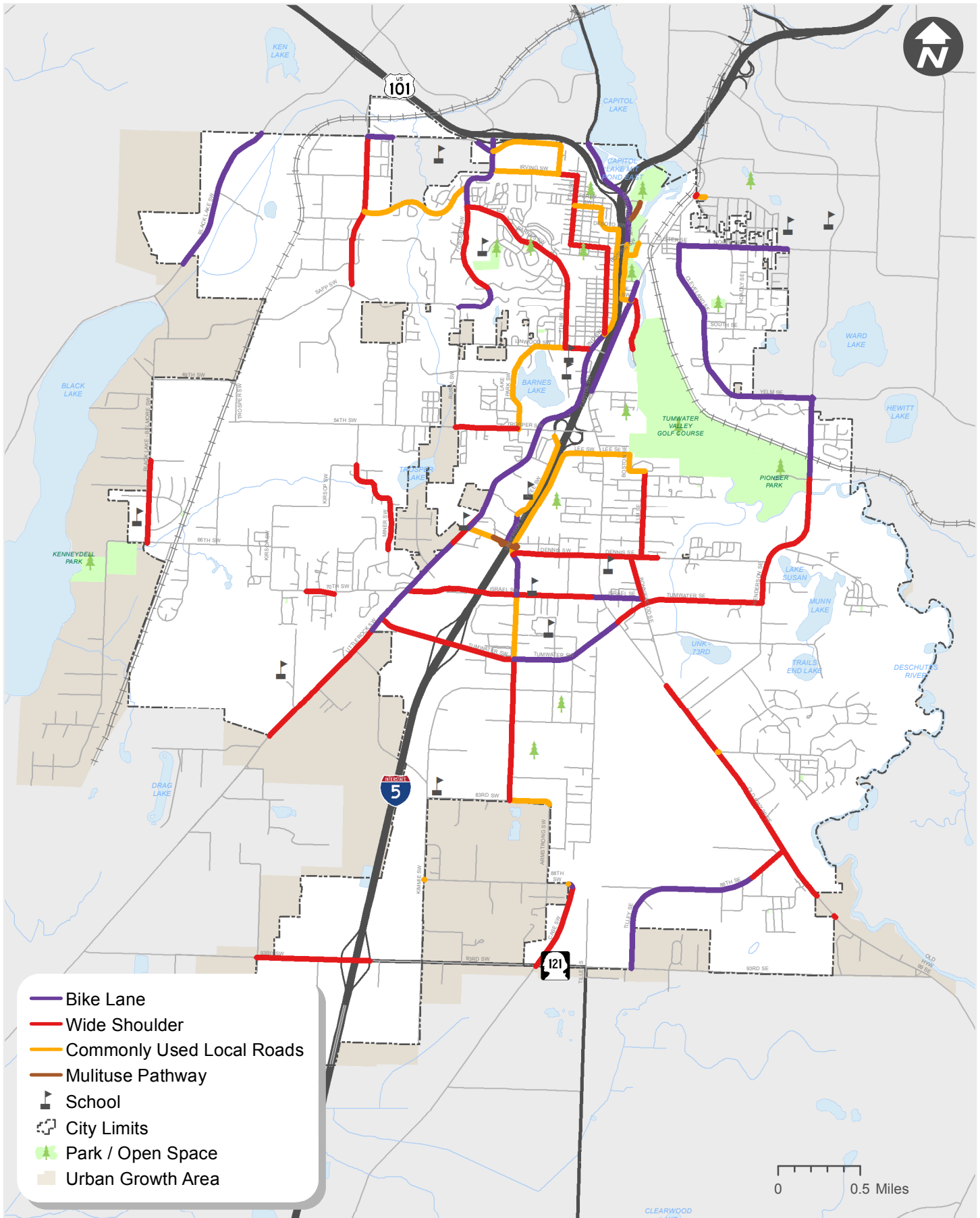
Bicycle Facilities

Bicycling is an important and growing mode of travel for people in cities across the country. When appropriately planned, bicycle facilities have a role in reducing congestion, improving air quality, providing travel choices, encouraging exercise and recreation, and providing greater mobility for those without access to a vehicle.

A combination of bicycle lanes, wide shoulders, quiet streets, and off-street pathways provide the core network for bicyclists to travel. The following types of bicycle facilities are present in the City of Tumwater:

- **Bicycle Lanes** are dedicated striped roadway space for cyclists that are typically in both directions on the edge of the traveled way. They are marked with a wide white stripe and range from 4 to 6 feet in width (widths are typically measured from the lane stripe to face of curb). The City has approximately 11 miles of bicycle lanes.
- **Wide Shoulders** are on the edge of the traveled way where there is a reasonable distance available for pedestrians and cyclists to travel with minor impact to motor vehicles. Wide shoulders mean striped shoulders with more than 4 feet width. Narrower shoulders often result in non-motorized users being forced into the vehicle travel lanes. Widths are typically measured from the lane stripe to face of curb, or if no curb to edge of pavement. There are approximately 15 miles of roadways with wide shoulders in the City limits.
- **Multiuse Pathways** are longer connections that include paved and unpaved trails that are designed for both pedestrians and bicyclists. These facilities are generally used for recreational purposes, but may also serve commuter and utility travel between neighborhoods and to surrounding areas.
- **Bike Routes** are low volume, low speed routes that may include shared lane markings or wayfinding signs for bicyclists, but are typically unmarked. These quiet streets that are commonly used by bicyclists comprise approximately 7 miles of the existing bicycle network.

The existing bicycle facilities in Tumwater are shown in Figure 2. Some cities are considering or have built the following bicycle facilities: bike boulevards (like bike routes, but with traffic calming elements); protected bike lanes (like bike lanes but physically separated from vehicle traffic); and specialized bicycle facilities at major intersections.



Existing Bicycle Facilities Map

City of Tumwater Transportation Element

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FIGURE

2

Non-Motorized Network Hierarchy

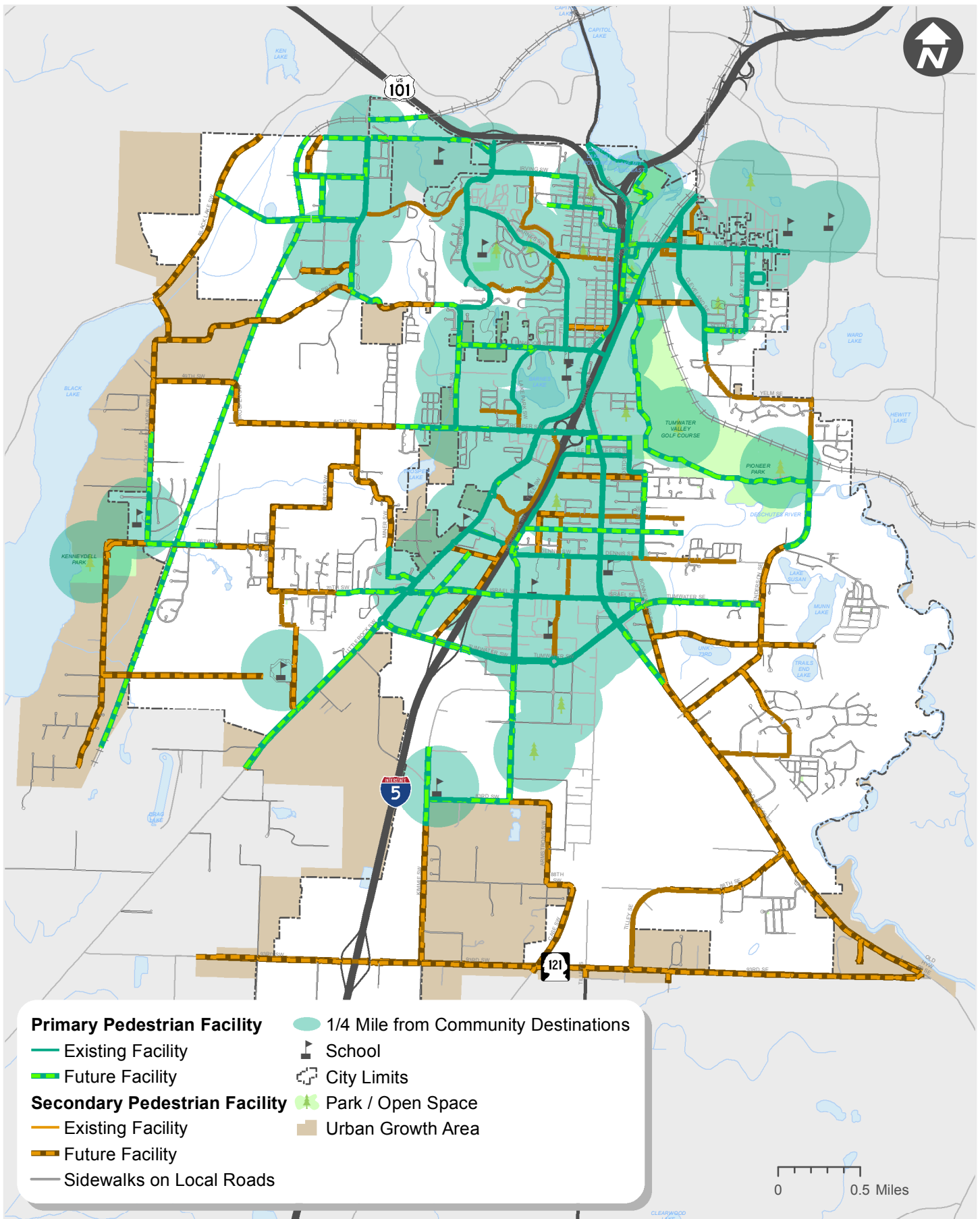
For the purposes of this sample existing analysis the primary and secondary routes were defined for the City of Tumwater network. They are defined separately for pedestrian and bicycle routes.

Pedestrian System

Proximity to schools, transit stops, parks, and other destinations were used to identify priority areas for the pedestrian network. Primary and Secondary pedestrian routes were determined based on the following criteria:

- **Primary pedestrian routes** are sections of arterial and collector roadways that are within ¼ mile of community destinations (schools, parks, and transit stops) that are expected to serve a higher volume of pedestrians. Multiuse pathways are also primary pedestrian routes due to their importance for all non-motorized travelers. Other streets may be included to complete logical gaps in the system.
- **Secondary pedestrian routes** are sections of arterial and collector roadways that are within ¼ mile of community destinations (schools, parks, and transit stops) that are expected to serve a lower volume of pedestrians. Other streets may be included to complete logical gaps in the system.

Pedestrian facilities on Primary routes anticipate higher levels of pedestrian activity due to their proximity to community destinations that generate walking trips. Secondary routes do not have as much pedestrian activity but complete important gaps in the pedestrian network. The City of Tumwater pedestrian network map is shown in Figure 3.



Pedestrian Network Map

City of Tumwater Transportation Element

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FIGURE

3

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Bicycle System

Bicycles are a network of primary and secondary bicycle streets that form a complete network, linking major bike destinations. The bicycle LOS includes look at the complete bike network considering both the bicycle corridors and the conflicts at major intersections and freeway interchanges.

- **Primary bicycle routes** connect community destinations through a backbone network of arterials, collector roadways, and local streets identified as bike routes. Multiuse pathways are also primary bicycle routes due to their importance for all non-motorized travelers.
- **Secondary bicycle routes** include other arterials, collector roadways, and local streets identified as bike routes that serve as connections between primary bicycle routes.

Primary and Secondary bicycle routes anticipate higher volumes and levels of bicycle activity. The City of Tumwater bicycle network map is shown in Figure 4.



City of Tumwater Transportation Element

FIGURE

4

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C. CAPITOL BOULEVARD CORRIDOR PLAN –
TRANSPORTATION SUMMARY

Following are excerpts from the Capitol Boulevard Corridor Plan with particular relevance to this Transportation Master Plan. The complete plan and its implementing regulations can be found at

Transportation-related Goals and Objectives from the Capitol Boulevard Plan

Improve mobility for pedestrian, bicycle, bus, and automobile transportation.

- Incorporate a multi-modal strategy to make transportation safe and enjoyable for a range of users.
- Develop a multi-modal street network and supporting land uses that diffuse the dependency on Capitol Boulevard to meet the needs of all users at all times.
- Balance regional transportation needs, business access, and non-motorized circulation.
- Address safety of all users.
- Refine multi-modal street design standards to guide new street development that supports walkable communities.
- Consider a variety of measures to reduce excessive traffic speed on existing streets.

Improve pedestrian and bicycle environments.

- Create safe, universally accessible and comfortable walking and bicycling routes throughout the community, especially to schools.
- Improve the safety of existing crosswalks and intersections.
- Utilize urban design, landscaping, sidewalk art, and creative streetscape treatments to encourage walking.
- Connect residential areas to the Boulevard.

Enhance transit experience and efficiency.

- Enhance the transit experience by improving bus stops and the connections to them.
- Increase transit ridership in the central zone.

Transportation Directives and Planning Principles

Directives:

- Reduce congestion growth
- Provide for pedestrian and bicycle connectivity
- Improve neighborhoods
- Beautify corridor
- Mitigate new development impacts

Principles:

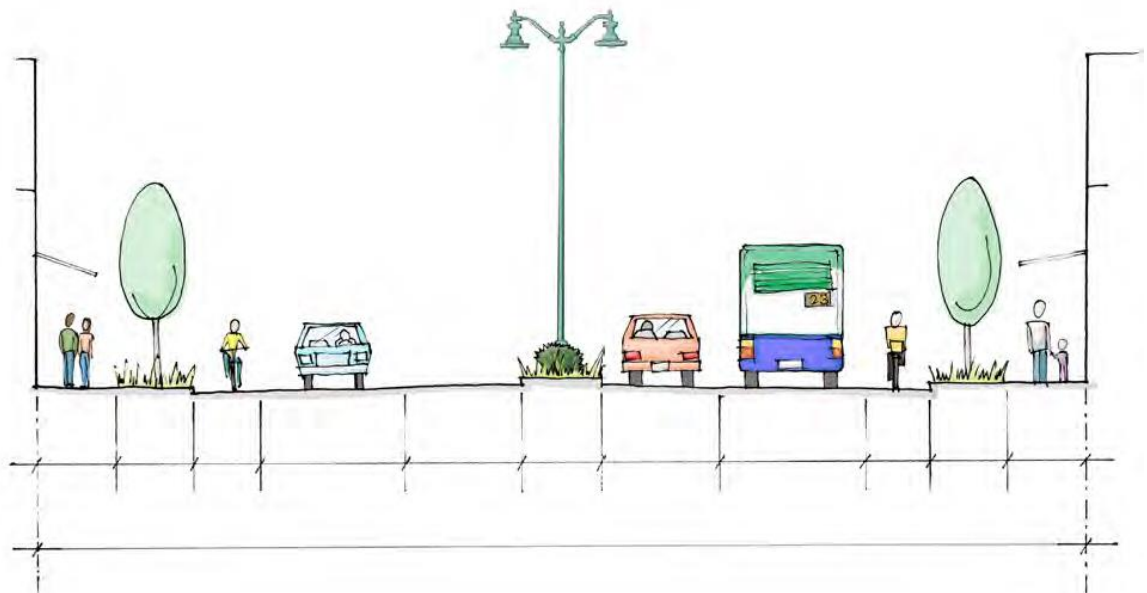
- Added travel lanes to quell congestion is neither feasible or desired
- A parallel street system should be pursued
- Ensure traffic operations help prioritize premium transit
- Enhance streetscape at major intersections and crossings
- Integrate and enhance bus stop facilities
- Establish parallel and intersecting bike network
- Establish parallel and intersecting walking routes

Transportation System Recommendations:

By repurposing existing right-of-way Tumwater will add bike lanes to Capitol Boulevard without having to reconstruct the entire street, which would be cost prohibitive.

(T-7) Initiate Capitol Boulevard improvements, including:

- Rechannelize the street to remove the continuous center, left-turn lane and replace with a 4-6 foot raised median, re-designate travel lanes, and designate new bicycle lanes between T Street and Dennis Street.
- Remove U Street pedestrian crossing due to its proximity to the new T Street crossing; and
- Construct new roundabouts at T, X, and Dennis Streets.



(T-8) Examine the design needs for vision- and mobility-impaired pedestrians, including the need for accessible and audible pedestrian signals, and install new pedestrian crosswalks and hybrid pedestrian beacons at or near:

- New roundabouts
- Gerth Street
 - BPA transmission line corridor
- Existing pedestrian crossing between Dennis Street and Israel Road

(T-9) Use the VE study findings to help determine whether similar median treatment, bike lane and roundabout installations are also suitable on Capitol Boulevard north through Lee Street and south to Israel Road, or whether existing signalized intersections (Lee and Israel) may require minor widening to accommodate greater u-turn traffic demand.

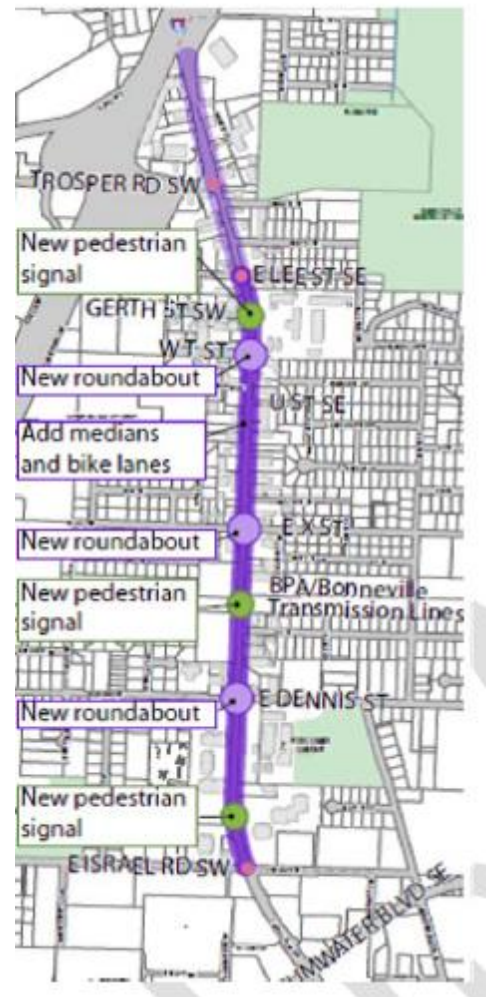
(T-10) Coordinate with property owners and purchase additional rights-of-way to construct a wider sidewalk corridor zone as feasible.

Connectivity Recommendations:

(T-3) Consider findings of Capitol Boulevard / Trospen Road Value-Engineering (VE) study and complete center median curbing along Capitol Boulevard from Trospen Road to Lee Street, in coordination with:

- New North-South Street – a low-speed local access street connection linking Ruby, Linda and Lee Streets with Trospen Road at the Capitol Boulevard intersection.
[Illustration to the right is a schematic of the proposed cross section for this new neighborhood connection.]
- Westside Internal Connectors

(T-6) Construct local connectors facilitating circulation and access to businesses between Trospen Road and W Lee Street west of Capitol Boulevard



The mobility strategy for Capitol Boulevard includes roundabouts and medians and the addition of bike lanes and improved pedestrian facilities to help transform the old highway character of this street into a more urban, people-oriented place.



(T-13) Construct a narrow two-lane access street between W Lee Street and W T Street along the 6th Avenue SW right-of-way. *[This small roadway would allow residents on Gerth Street to access Capitol Boulevard at a signal or roundabout and would greatly facilitate local circulation.]*

(T-14) Extend X Street westward to Linderson Way SW. *[A connection here provides a much needed east-west route for emergency vehicles and local traffic. Implementation and alignment of this street connection depends on development of property near Linderson. Traffic calming will ensure that X Street provides local access but does not become a shortcut.]*

(T-16) Extend 7th Avenue SW to connect West Y Street with 65th Way SW.

(T-17) Extend Charles Street and Boston Street to connect East W Street and East X Street. *[Boston Street connection will be a narrow alley and Charles Street extension will require ROW so these improvements are lower priority than some others.]*

(T-18) Establish a loop of bicycle lanes along Linderson Way, West and East Lee Streets, Boston Street, Hazelhurst Drive, Elm Street, and West and East Dennis Streets.

(T-19) Designate X Street, Dennis Place, and 7th Avenue as shared-lane bicycle routes, with signs and pavement markings for “sharrows.”

(T-21) Secure rights-of-way and construct a new shared-use pathway (a) along the BPA/Bonneville transmission lines between Elm Street and 6th Avenue, (b) from the transmission lines to the X Street extension, (c) from Lee Street to Trosper Road, (d) from the new North-South Street to Capitol Boulevard along Market Street, (e) along the 7th Street extension, (f) on the Boston Street easement between Pinehurst and Hazelhurst, and (g) two connections to the Deschutes Valley Trail.

(NL-15) Construct the Deschutes Valley Trail and associated trail spurs according to the Parks plan

Development-driven Transportation Policies:

(T-2) Install driveway modifications at Starbucks drive to prevent left turns. *[This will resolve current operational issues and safety concerns.]*

(T-5) Coordinate with local property owners to plan local street connectors providing local access alternatives to and from Capitol Boulevard via Lee Street.

(T-11) As properties redevelop, require (a) additional rights-of-way and construct a wider sidewalk corridor zone, and (b) parallel to Capitol Boulevard, external site vehicular connectivity.

(T-15) Construct internal streets within any WSDOT site redevelopment. *[These streets are needed for access but will also reduce congestion in this vicinity and enhance site's role as a community focus.]*

(T-20) Coordinate with local property owners and/or developers to construct sidewalks and bicycle facilities as part of new street construction, especially those new street connections identified in recommendations T-13 to T-17.

(T-22) As redevelopment occurs, require internal pedestrian connectivity linking neighborhoods behind the commercial strip to Capitol Boulevard.

Transit Policy:

(T-23) As part of the Capitol Boulevard street improvements the City should coordinate with Intercity Transit to revise the current bus stop location and design, conforming with the following:

- Far-side (of intersection) bus stop location guidelines;
- Removal of bus pull-out bays; and
- Placement of stops and added arterial crossing to coincide with recommended corridor improvements.

Traffic Calming Policies:

(NL-2) Construct traffic calming devices – bulb-outs, traffic circles, or chicanes – along X Street (at 7th Avenue and at the commercial/residential zone boundary), Elm Street (at Dennis Street, BPA/Bonneville corridor, and X Street), and along the bike route loop (Lee Street, Boston Street, Hazelhurst Drive, Dennis Street, and Linderson Way) as appropriate to moderate traffic speed. Undertake measures necessary to prevent parking impacts on safety and residential quality.

(NL-3) Ensure that the new access streets near Trosper Road include traffic calming devices.

D. BREWERY DISTRICT PLAN – SUMMARY OF RECOMMENDATIONS

Transportation-related Goals and Objectives from the Brewery District Plan

Brewery District Vision:

The Tumwater Brewery District is a vibrant, neighborly mixed-use urban community with abundant shopping and business services, safe and accessible transportation options and outstanding recreational amenities. At the heart of Washington State's "original city," the Brewery District continues to serve as an historic destination, even as it evolves to provide new homes and economic opportunity for a growing regional population. The District infuses the best of past and present urban development through the preservation of critical heritage sites, incorporation of modern urban design practices and emphasis on creating a unique sense of place.

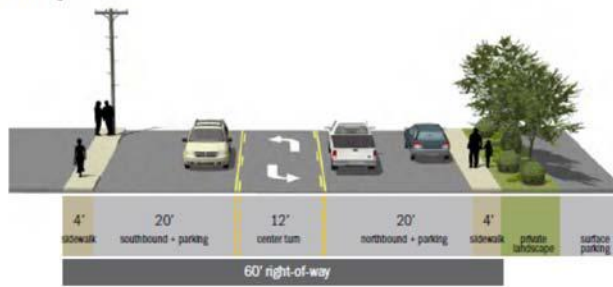
Create a strong sense of place by facilitating pedestrian access, establishing gathering places for residents and fostering a District identity.

- a. Evaluate opportunities for a pedestrian-oriented "Main Street"
- b. Consider opportunities for reducing/redistributing wide rights-of-way where appropriate
- c. Facilitate opportunities for pedestrian-oriented, mixed-use and commercial development.

Improve transportation options, safety, and access within and across the District.

- a. Reduce pressure on over-burdened intersections
- b. Improve transit, bicycle and pedestrian access into the District
- c. Prioritize and implement safety and comfort enhancements for non-motorized users
- d. Update current parking and access management framework

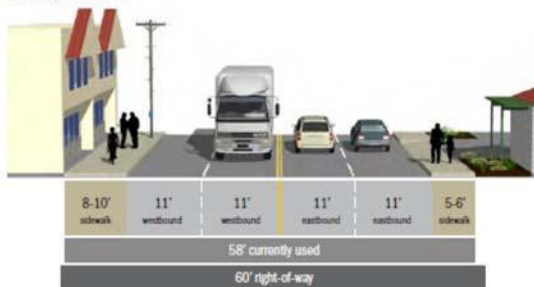
Cleveland Avenue - Custer Way to Capitol Boulevard
Existing Condition



Cleveland Avenue - Custer Way to Capitol Boulevard: Proposed Cross Section



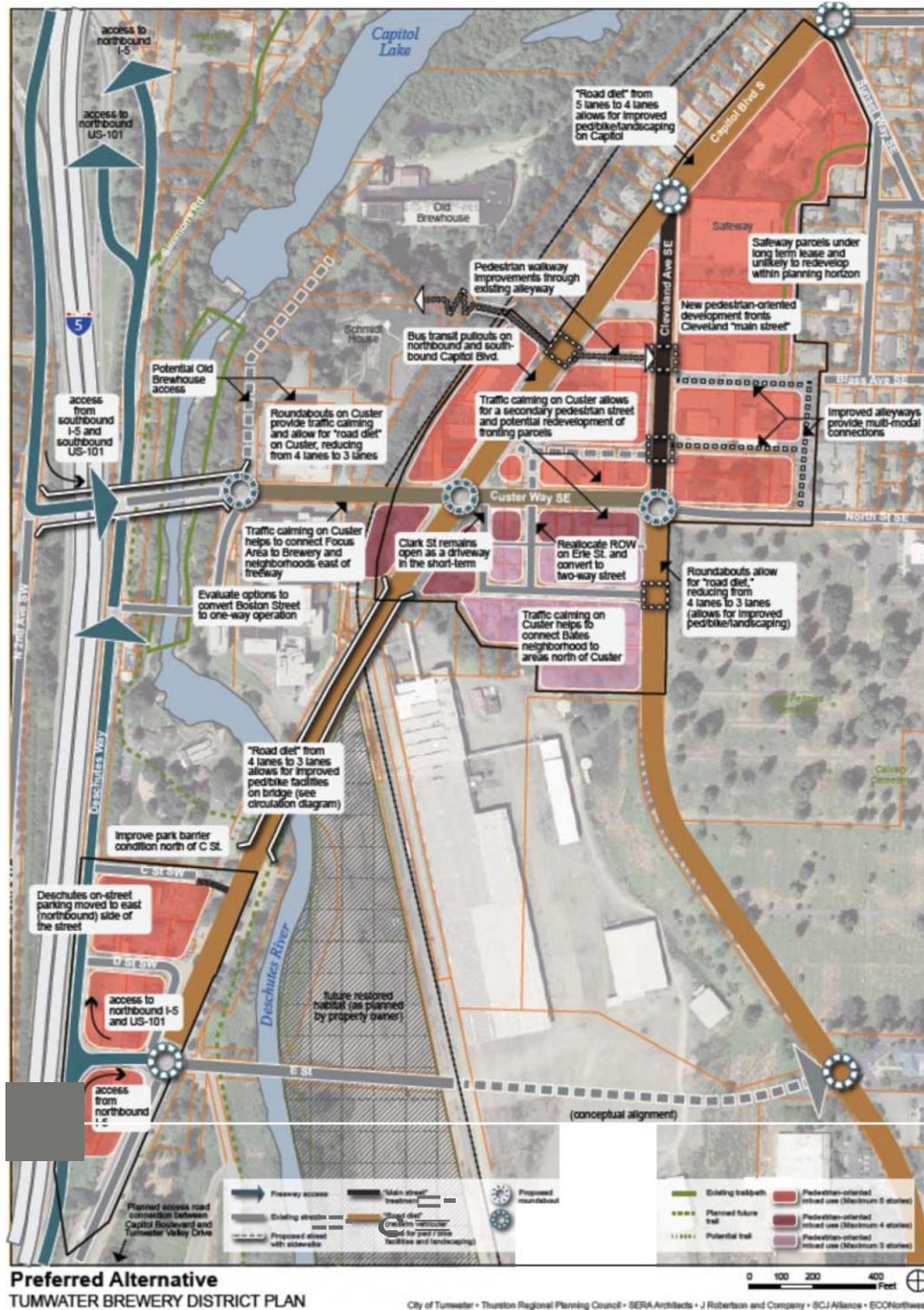
Custer Way - Custer Bridge to Cleveland Avenue
Existing Condition:



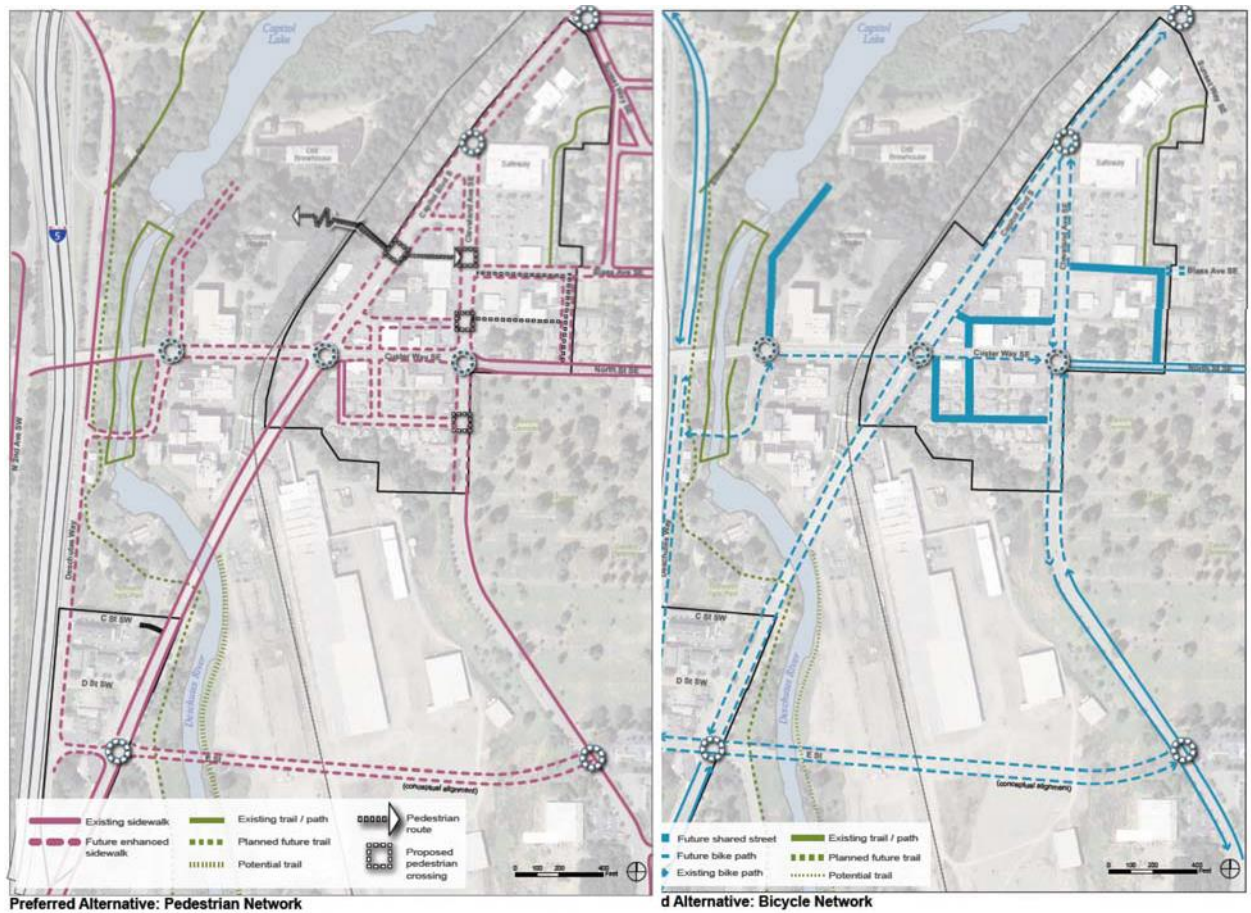
Custer Way - Custer Bridge to Cleveland Avenue
Proposed Cross Section:



The illustrations demonstrate how repurposing existing right-of-way can be used to create or enhance non-motorized facilities and contribute to the overall livability of a place. Cleveland Avenue, top, and Custer Way, bottom, will be reconfigured so that there is better balance between motorized and non-motorized uses in this area



The land use and transportation strategies for the Brewery District are completely integrated, each relying on the other to be most effective



Clearly defined strategies for addressing bike and pedestrian mobility will help ensure the successful transition of the Brewery District into a vibrant, people-oriented place.

Figure 3.4: A road diet on Cleveland Avenue will include adding bicycle facilities, widening sidewalks, and installing street trees and stormwater facilities. The calmed streetscape allows easier pedestrian crossings and creates a more welcoming environment for mixed-use (re)development along the 'main street'.



Potential to rehab existing development to be more pedestrian-oriented

New development built up against the sidewalk (parking in rear)

Housing above ground floor commercial



Wide right-of-way redistributed to pedestrians, bicycles, and landscaping

Well-marked pedestrian crossing

Pedestrian-scale lighting and streetscape elements

Active ground floor building design

Another example of how repurposing valuable right-of-way can be used to transform the character of a place. This planned treatment of Cleveland Avenue will take advantage of a vast space that is greatly under-utilized today.