Attachment D

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

Path: N:\Projects\0625 City of Tumwater\0625.17 Tumwater Transportation Master Plan\Traffic\Report\2016 0607 Appendix A.docx



SCJ Alliance June 2016

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**.

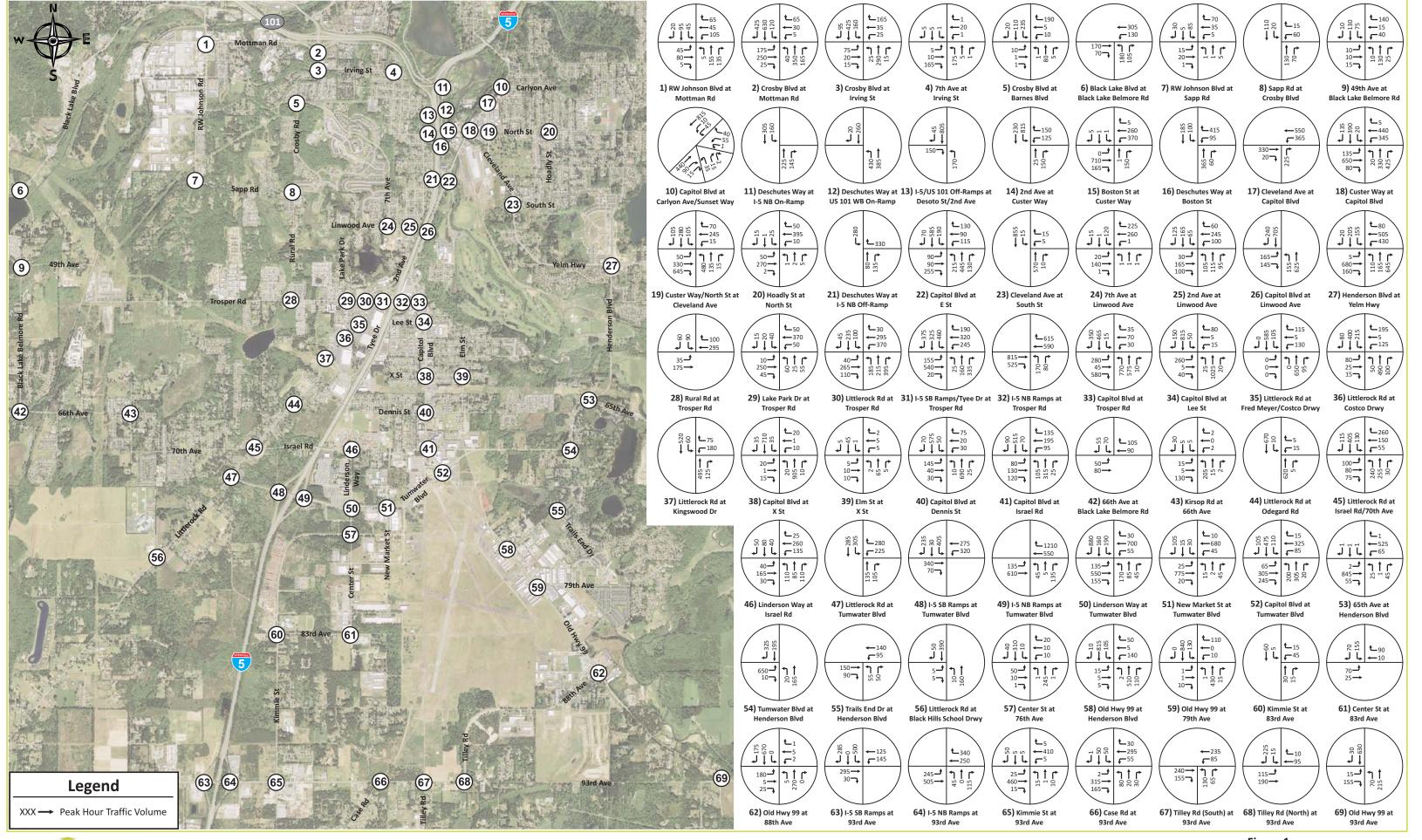
The existing intersection lane geometry and control types are provided on Figure 2.

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:

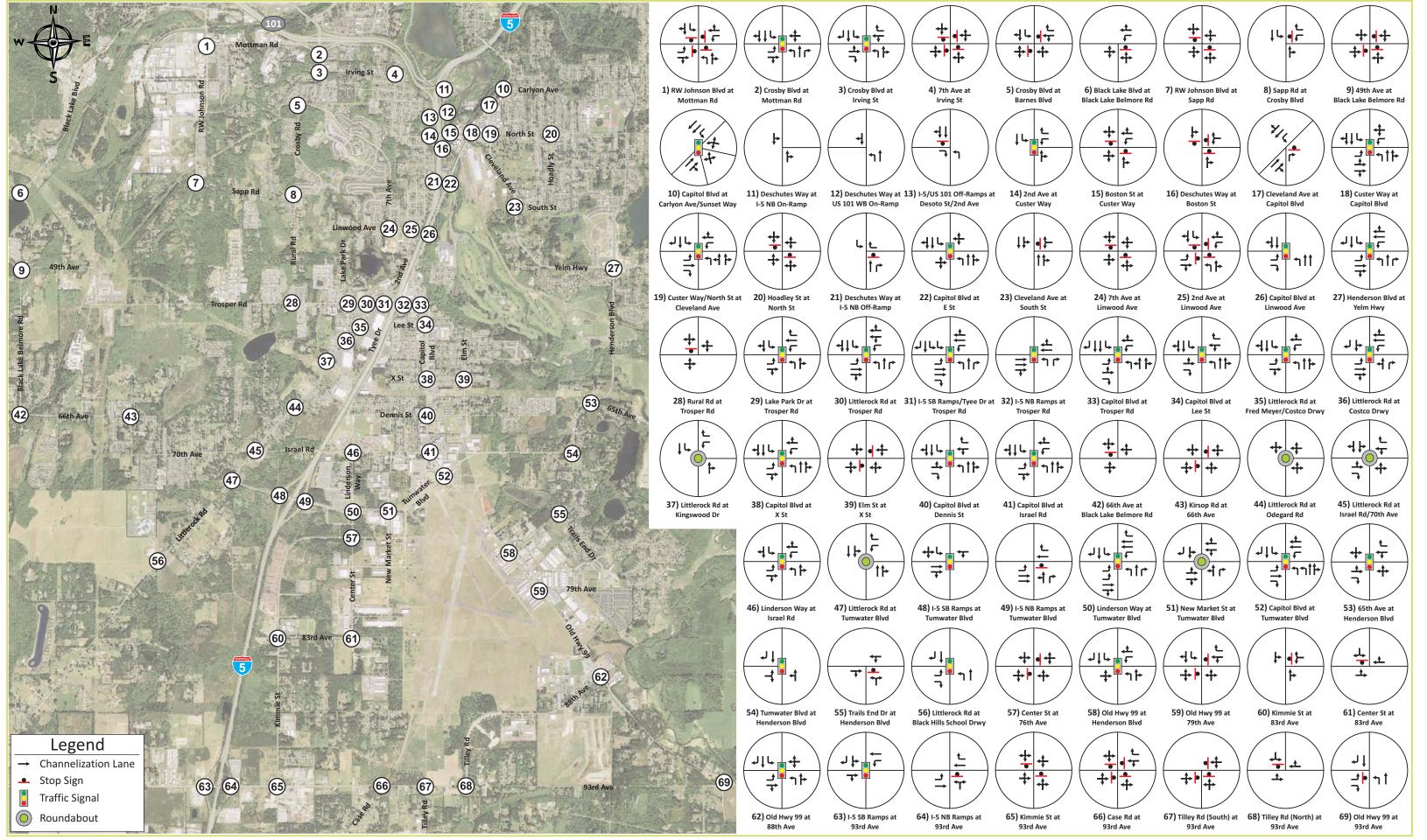
Crash Rate per MEV = $_$	1,000,000 X Total Collisions
	365 X Number of Years X Average Daily Entering Traffic

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





Tumwater Transportation Master Plan





Tumwater Transportation Master Plan

Table 1. Intersection Crash History 2010 through 2014

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/2nd 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

	Intersection	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	66th 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 Fedeeral or State court proceeding or considered for other purposes in any action for damages arising from any occurance 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.

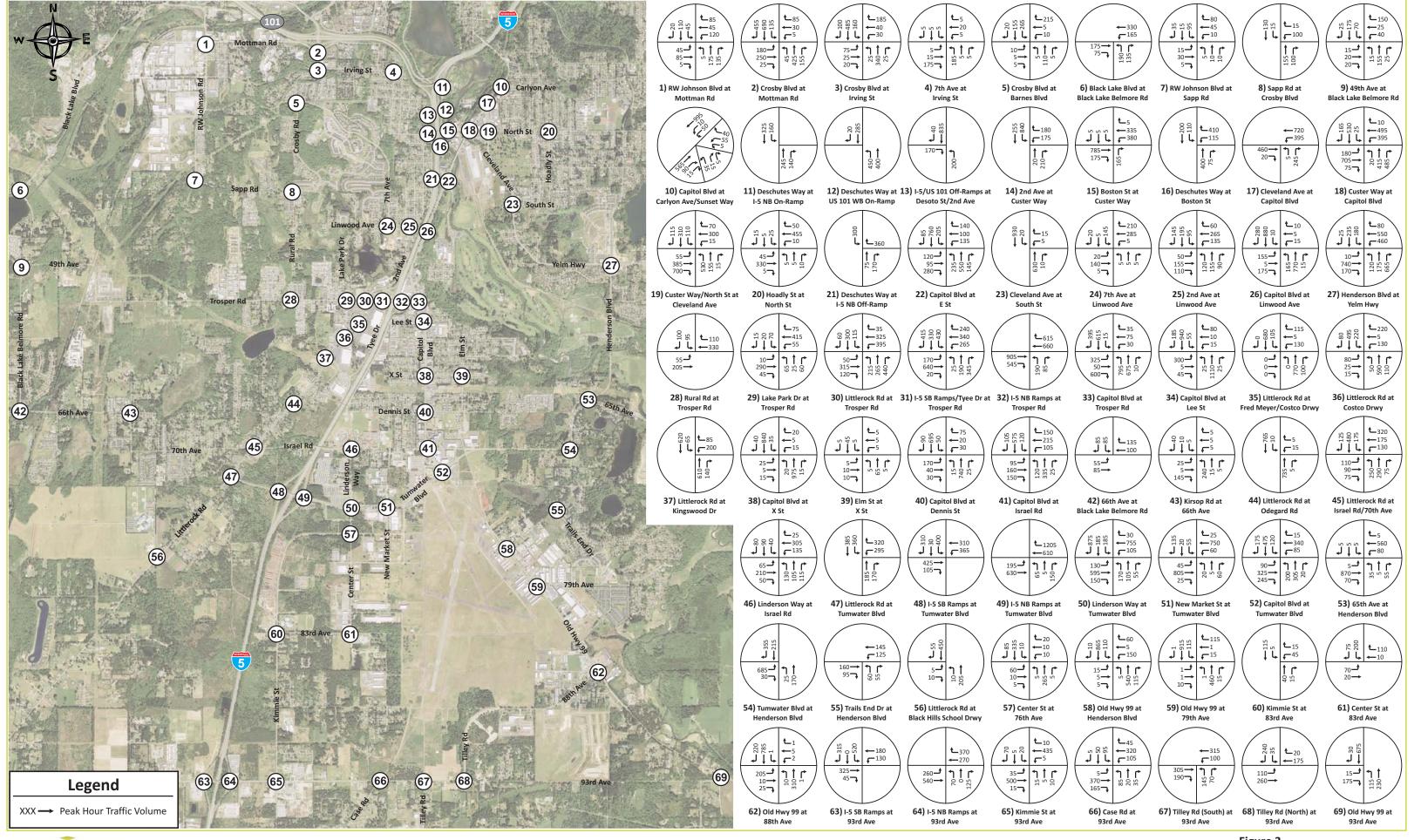
Model plots showing the Traffic Analysis Zone structure, roadway network and "raw" model traffic volumes are included in **Appendix A-3**.

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.

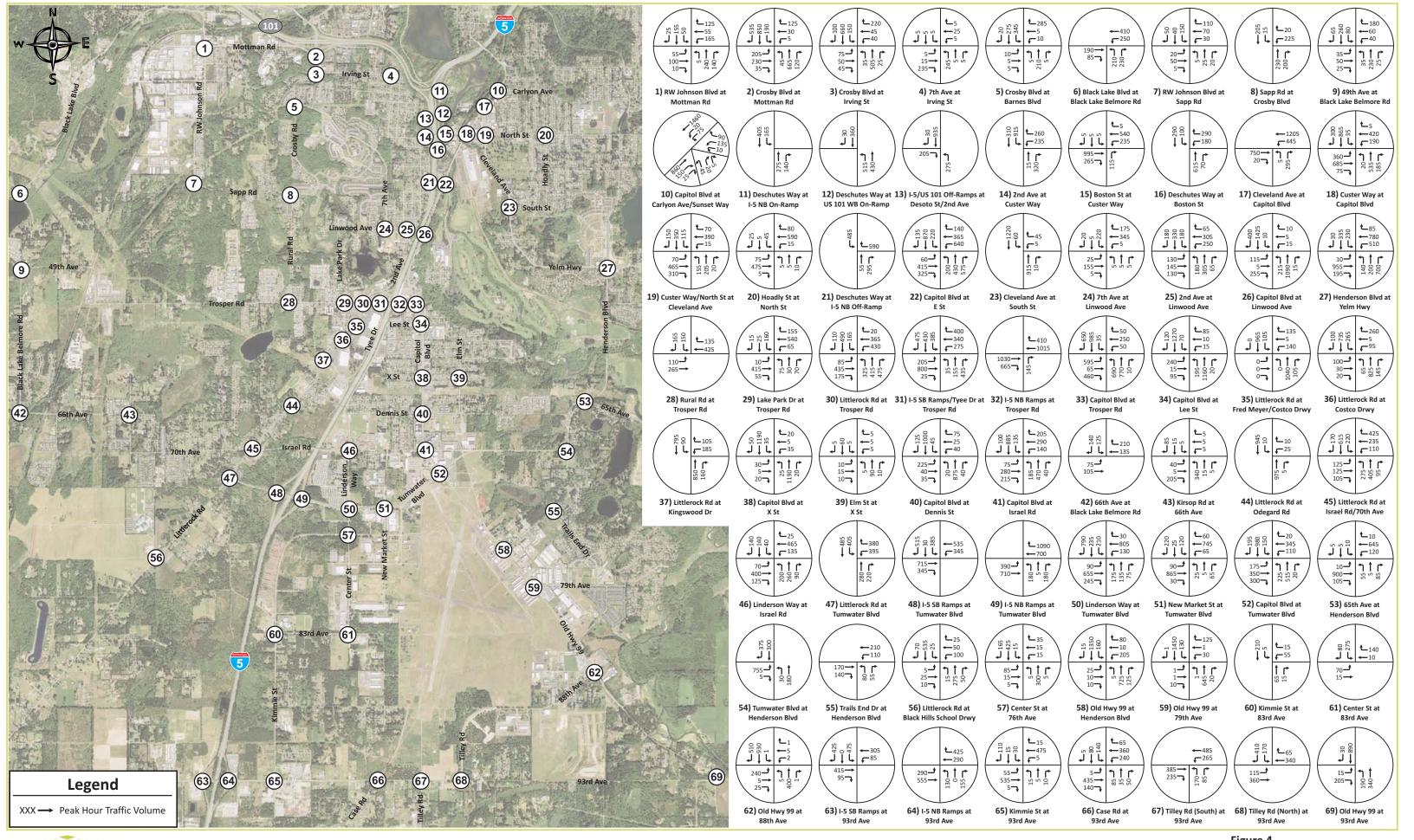
For the 2022 horizon the model growth was calculated between the 2014 and 2040 models and 7 years of that growth was added to the 2015 actual counts. The 2040 model was run assuming none of the RTP projects in place by the 2022 horizon.

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 Transportation Master Plan

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)
Α	≤ 10	≤ 10	0.0 – 0.59
В	> 10-20	> 10-15	0.60 - 0.69
С	> 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**.

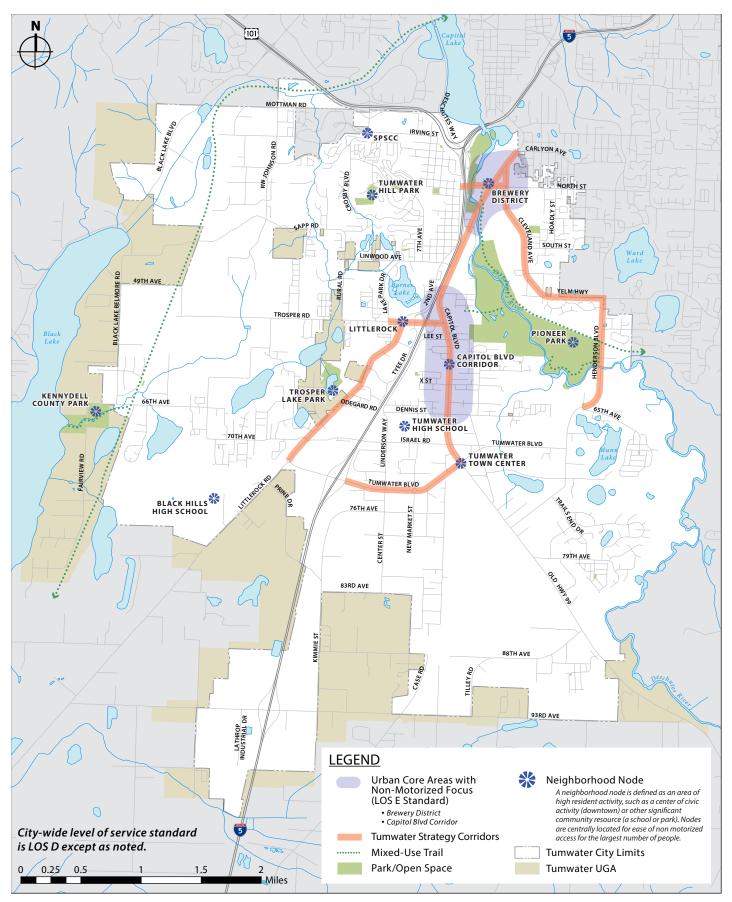


Table 3. Existing 2015 PM Peak Hour Level of Service

		Intersection	Intersection 2015 Ba	Intersection 2015 Base Year	
Number	Intersection	Control	LOS (Delay)	Worst v/	
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	49th 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

		Intersection	2015 Bas	se Year
Number	Intersection	Control	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	66th Ave/Black Lake Belmore Rd	TWSC	B (11)	0.18
43	Kirsop Rd/66th Ave	TWSC	B (13)	0.21
44	Littlerock Rd/Odegard Rd	RAB	A (5)	0.59
45	Littlerock Rd/Israel Rd/70th 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/76th 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.

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

^{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.

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

		Intersection2040 Base Year		
Number	Intersection	Control	LOS (Delay)	Worst v/o
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	Hoadly 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	2 nd 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

		Intersection	2040 Bas	se Year
Number	Intersection	Control	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	65th 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/76th Ave	TWSC	D (33)	0.46
58	Old Hwy 99/Henderson Blvd	RAB	B (11)	0.69
59	Old Hwy 99/79 th 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/93 rd Ave	TWSC	F (112)	1.06
65	Kimmie St/93 rd Ave	TWSC	D (34)	0.52
66	Case Rd/93 rd Ave	AWSC	F (53)	1.30
67	Tilley Rd (South)/93 rd Ave	AWSC	F (54)	1.28
68	Tilley Rd (North)/93 rd Ave	TWSC	F (60)	0.78
69	Old Hwy 99/93 rd 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.

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,

^{2.} HCM 2000 was used at this signal because the shared through-left lane is not accurately analyzed in HCM 2010.

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 it 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 apartement 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 in 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.

<u>Deschutes Way – Between E Street and US-101 Ramps</u>

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 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

				2040 Improv	
Number	Intersection	Existing Intersection Control	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

		Intersection	2022 Bas	se Year
Number	Intersection	Control	LOS (Delay)	Worst v/
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/2nd Ave1	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

		Intersection	2022 Bas	se Year
Number	Intersection	Control	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/66th 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 (2. 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 is **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

Project is already funded
 Projected expected to be developer funded

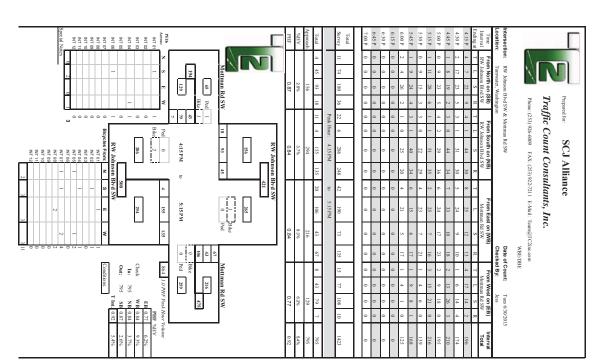
Table 8. Planning Level Cost Estimates – Intersection Projects

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	Trosper Rd/Rural Rd	\$500,000
I-13	Trosper Rd/2 nd Ave/Littlerock Rd	\$2,500,000
I-14	Trosper Rd/Tyee Dr/SB I-5 Ramps	\$2,500,000
I-15	Trosper 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

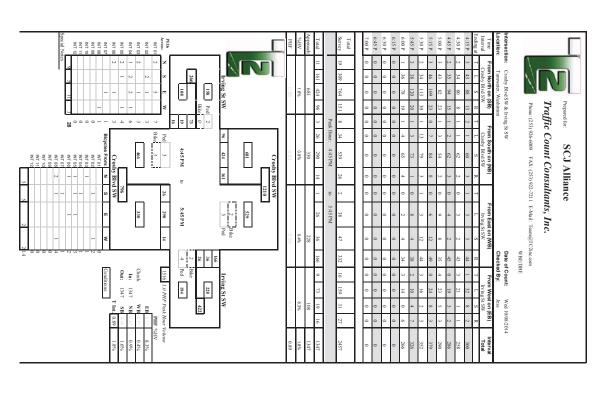
Total Roadway Cost	\$269,033,585
Total Intersection Cost	\$66,100,000
Total Cost	\$335,133,585
Developer Funded/ Already Funded	-\$60,540,000
Potential Cost for City	\$274,593,585

APPENDIX A-1TURNING MOVEMENT COUNTS



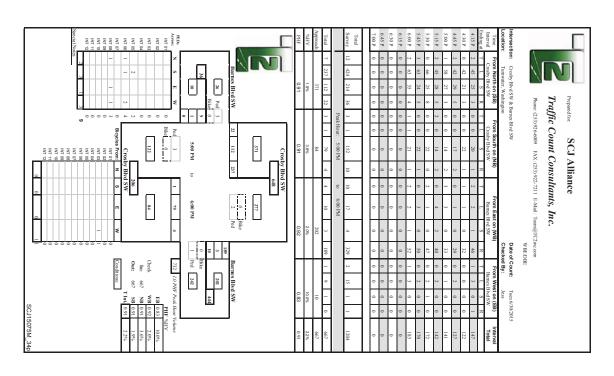


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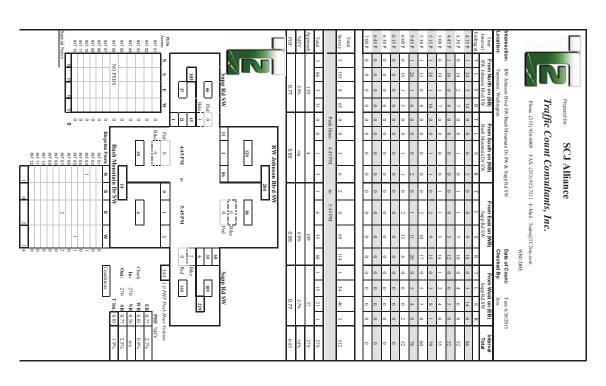


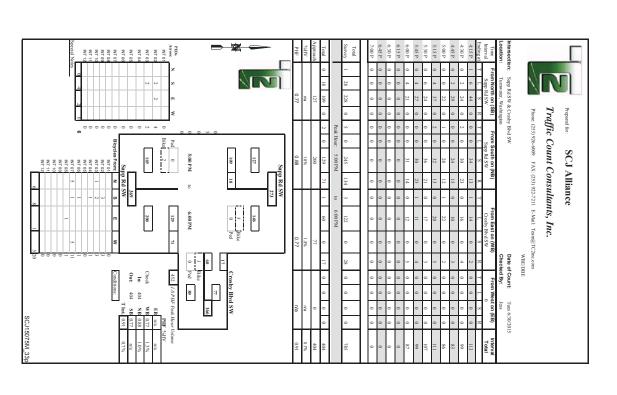
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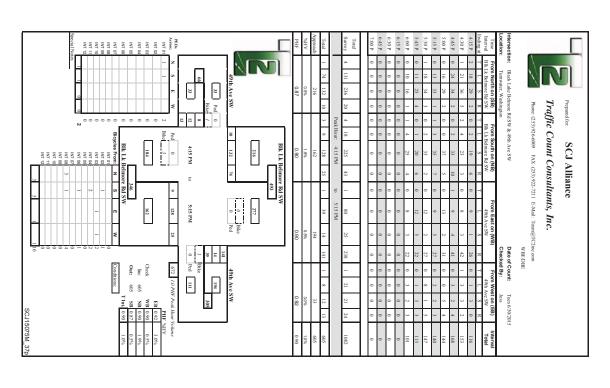




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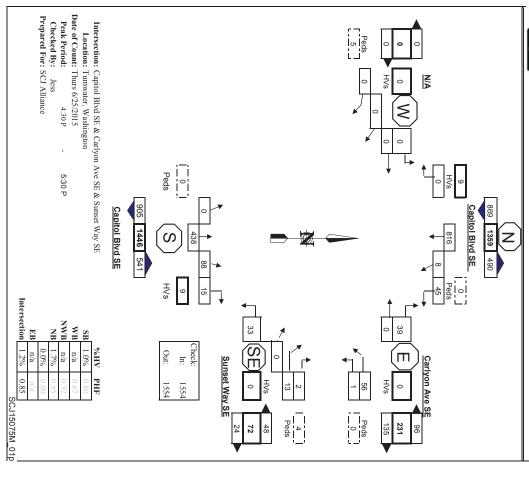


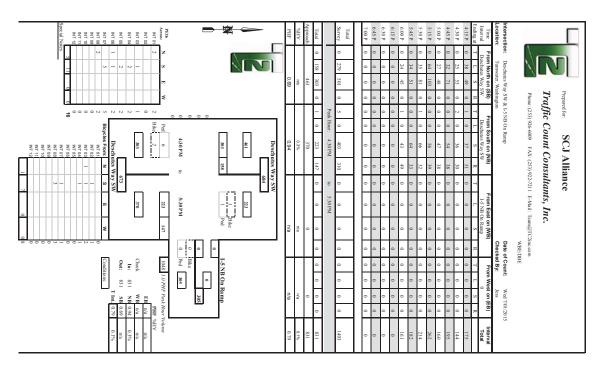












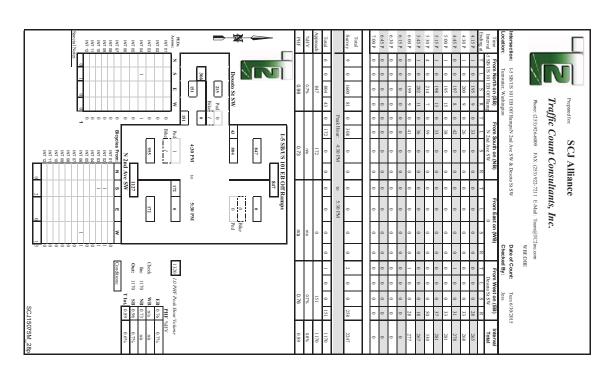


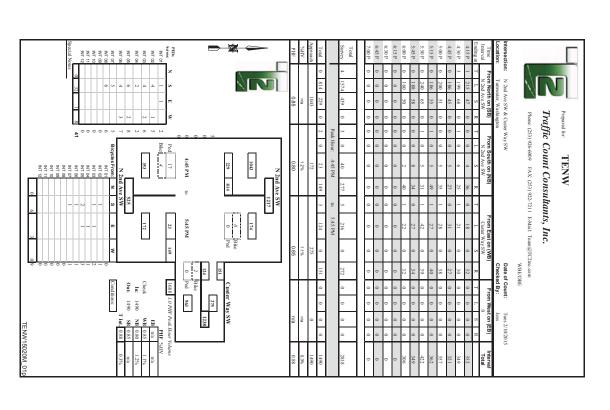
SCJ Alliance

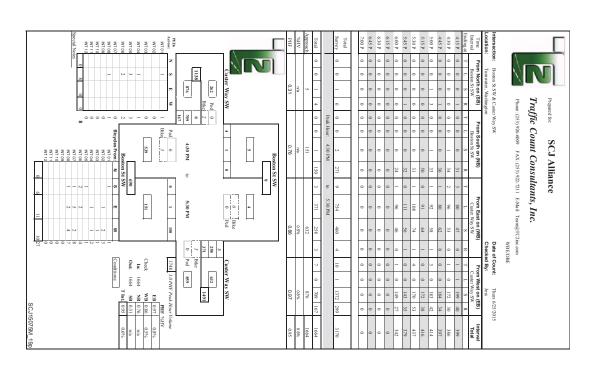
Traffic Count Consultants, Inc.

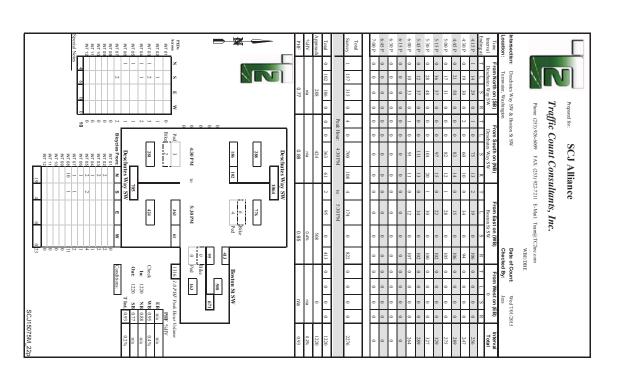
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

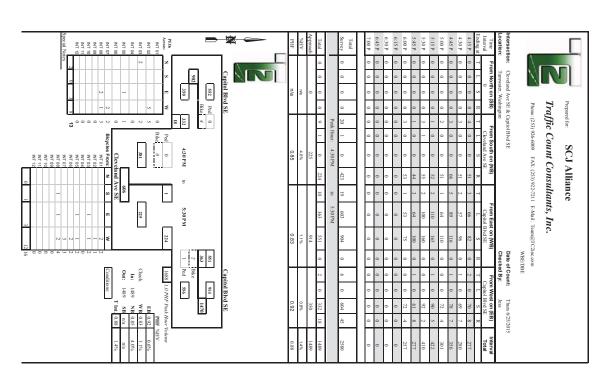
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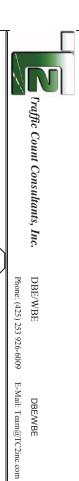


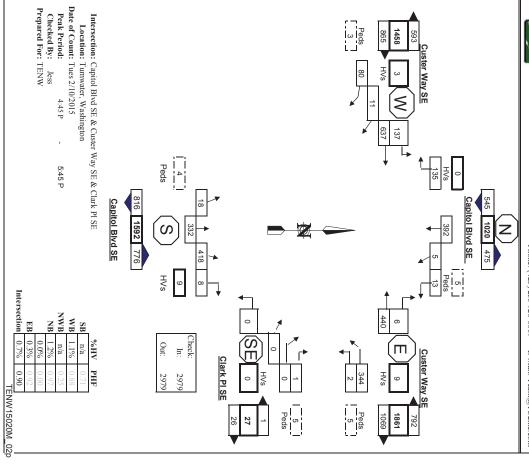


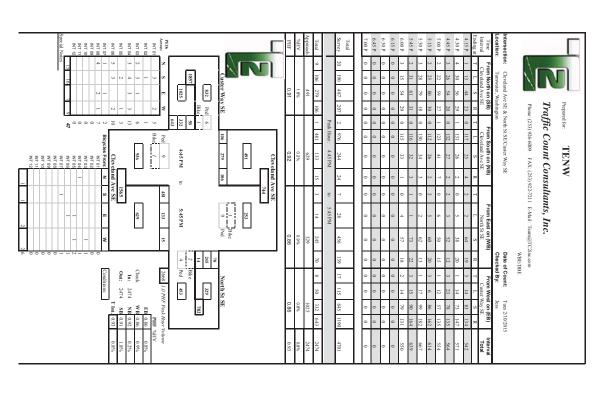


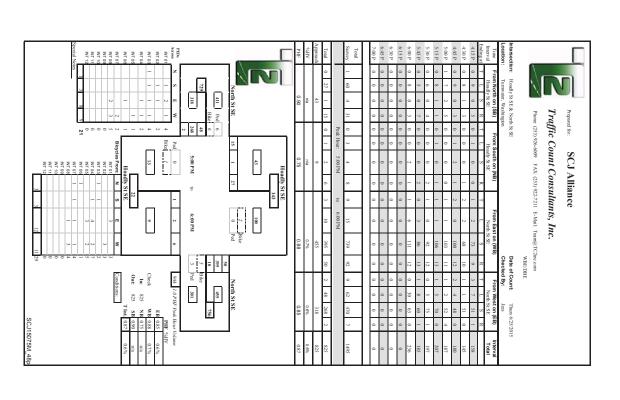


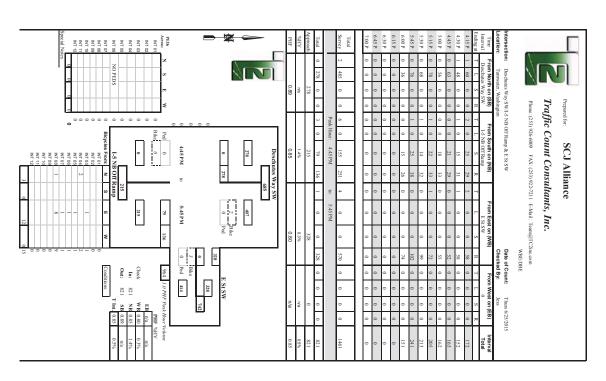


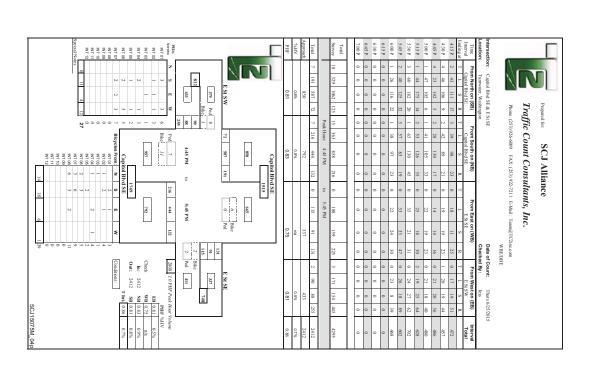


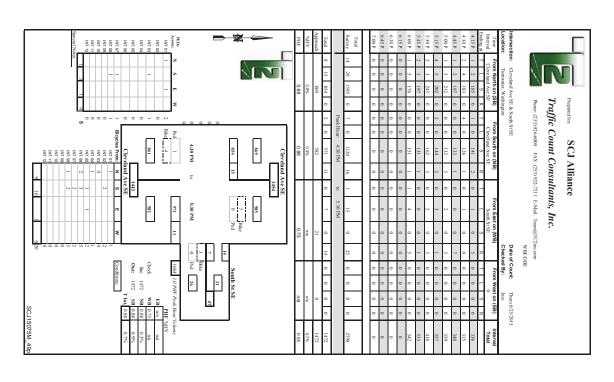






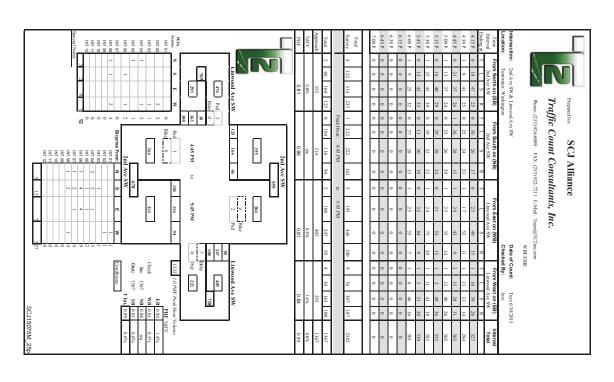


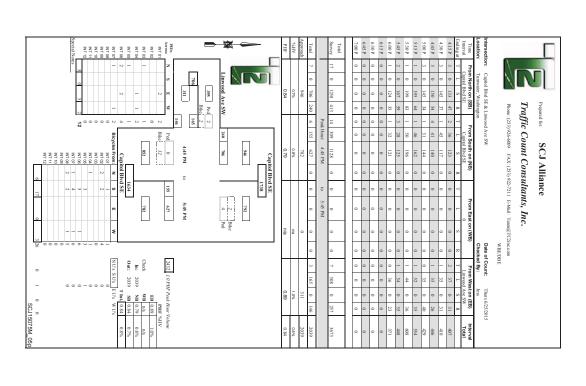


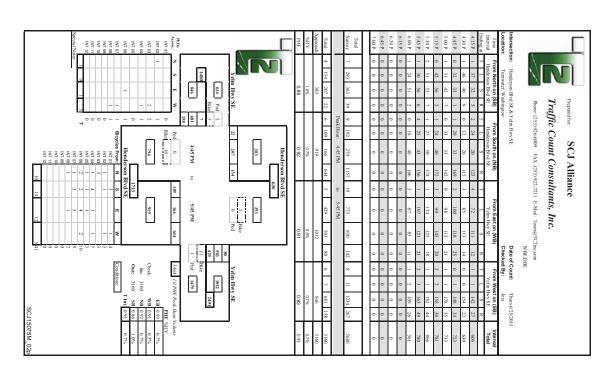


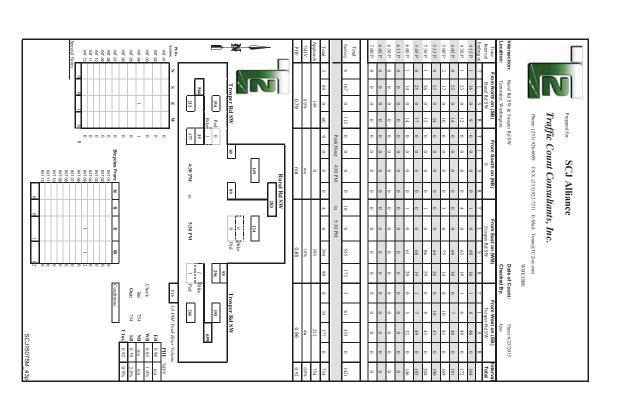


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5:00 P	-	38	0	4	0	0	0	0	2	0	42	30	-	4	31	0	149
5:15 P	-	40	0	4	0	0	0	0	-	0	57	46	2	8	33	0	881
5:30 P	0	26	0	4	0	0	0	0	-	0	65	70	2	5	36	0	206
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6:00 P	0	32	0	2	0	0	0	-	-	-	2	60	-	5	48	0	213
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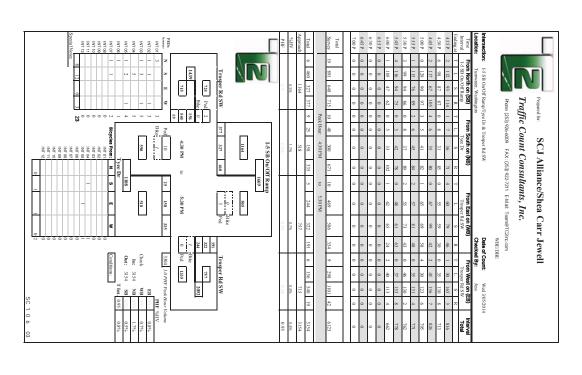




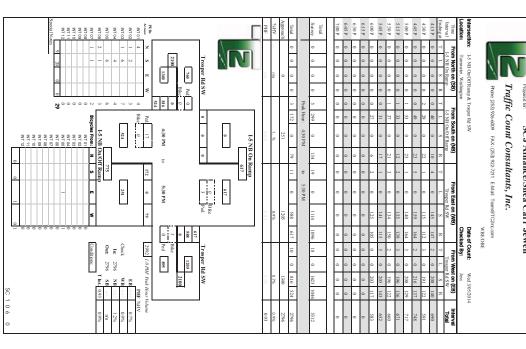
ersection: Lake Park Dr & Trosper Rd SW 750 306 444 Ped 3 Bike 1 Traffic Count Consultants, Inc. Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com Peak Hour: 4:45 PM Ped 1 Bike 0 114 72 SCJ Alliance/Shea Carr Jewell 4:45 PM 88 Bike 0 Ped 143 5:45 PM 52 369 472 51 0 Bike 0 Ped 347 Conditions: Check 993 Out: 993 Frosper Rd SW 472 819 Wed 3/05/2014

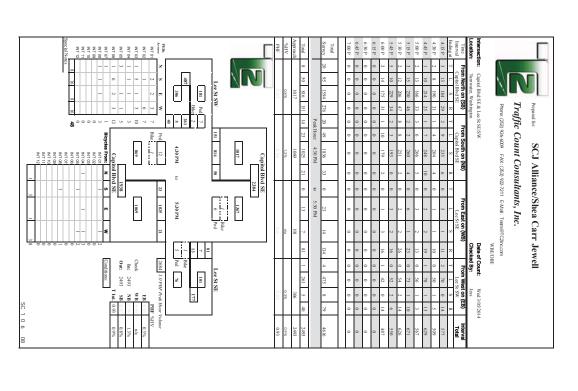


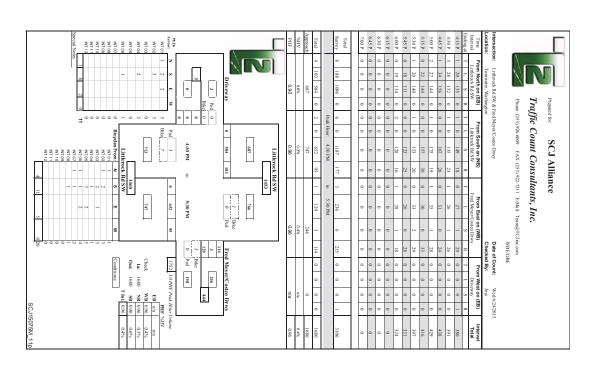
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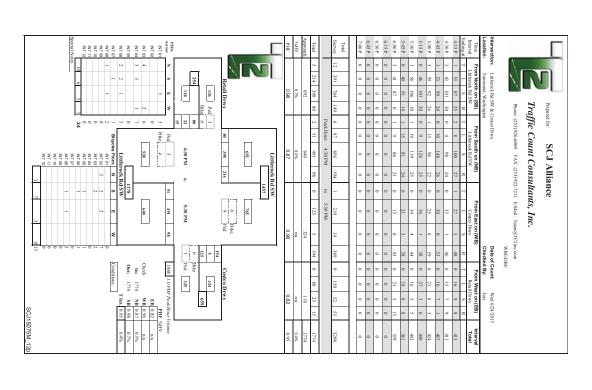


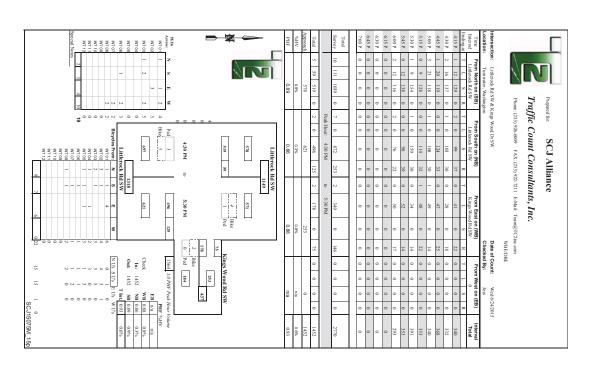










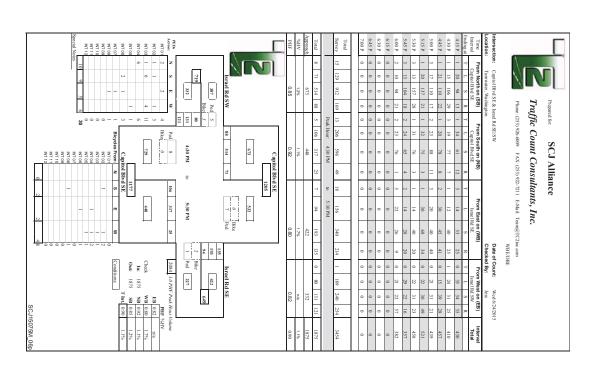


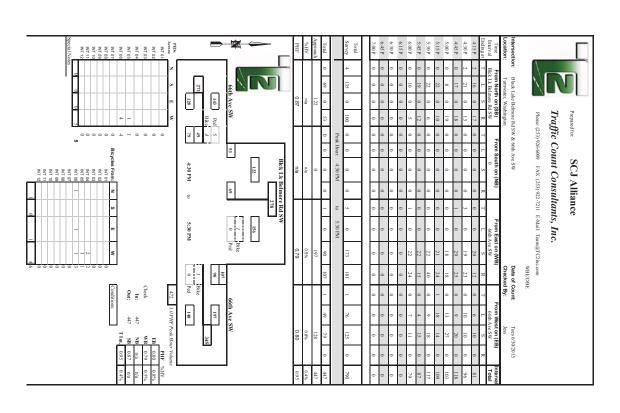


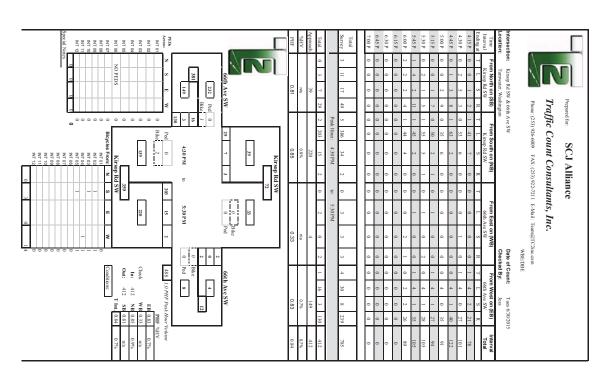
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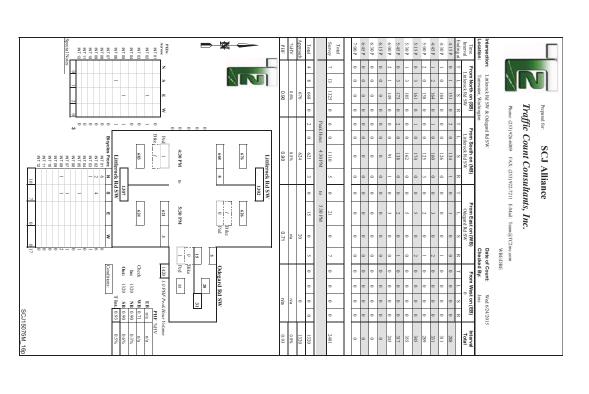


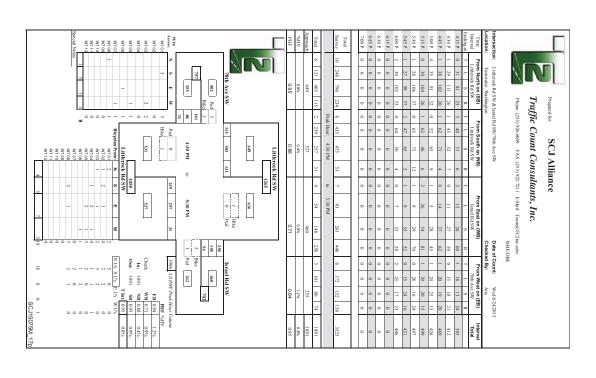
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Capitel Blvd SE & Dennis St SE/SW Tumwater, Washington M North on (SB) From Sc	vd SE	+	+	134 23	-	Н	156 13	116 15	0 0	0	0 0	lŀ	1108 137		576 71	699		9		Dennis St SW
From:	T Cal	+	+	2 4	3 1	2 5	1 3	1 2	0 0	0 0	0 0	lŀ	15 24	Peak Hour:	9 12			٦		<u>2</u>
From South on (NB)	Capitol Blvd SE	144	100	196	186	136	148	91	0	0	0		1207	: 4:15 PM	688	723	0.88		Ca 699	
NB)	R (ND)	15	, ,	6 -	6	4	4	u	0	0	0 0		49	2	23				Capitol Blvd SE	52 To
	⊣ .	0		0 0	0	0	0	0	0	٥	0 0		0	60	0				-, -, -, 1, 1, 1,	
rom Eas	Dennis St SE	16		7 0	6	7	6	œ	0	0	0 0		65	5:15 PM	28				0 910	
From East on (WB)	St SE	4		5 0	4	4	8	4	0	0	0		42		22	125	l	0.80	Bike	Bike
Date of Count: Checked By: Fron	≂	15	3 1	16	22	11	18	17	0	0	0 0		136		75		l	- L	L	4 0 22 23
Count ad By:	T	0	> <	0 0	-	0	0	-	0	0	0 0		2		1					Den Bike
Wes	Dennis St SW	28	3 6	42	43	2.5	19	3	0	٥	0 0		232		147					Dennis St SE
by: Jess From West on (EB)	St SW	+	+	4 5	-	Н	7	9	0	0	0 0	lŀ	3		41	216	588	0.71	0.71	Demnis SI SE 125 126 127 128 128 128 128 128 128 128
5/2014	~ 2	4	`	4	12	6	3	4	0	٥	0 0		45		28	╀		H	\vdash	\vdash
Interval	Total	403	400	456	487	366	402	293	0	0	0 0		3227		1763	1763	0.91			

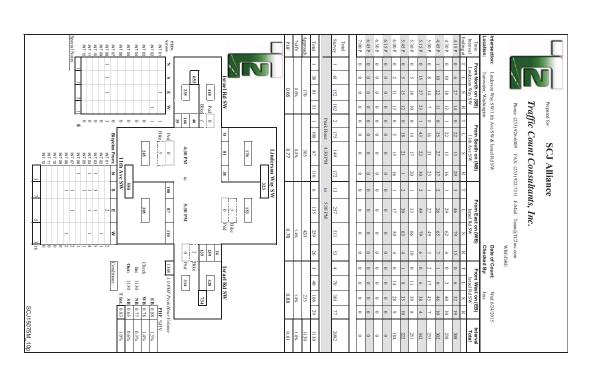


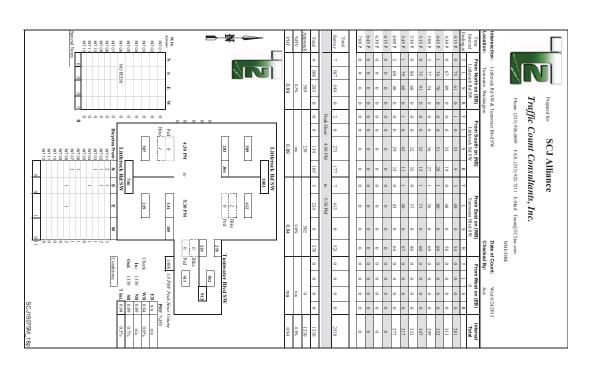












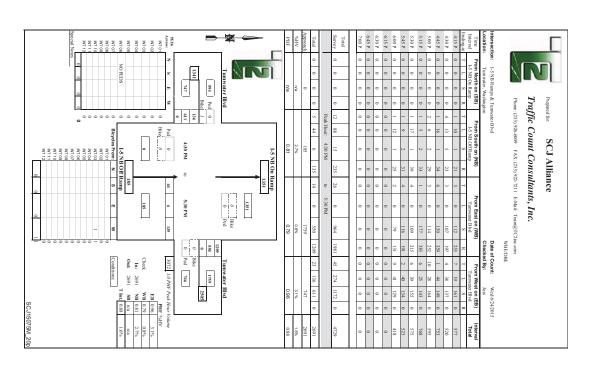


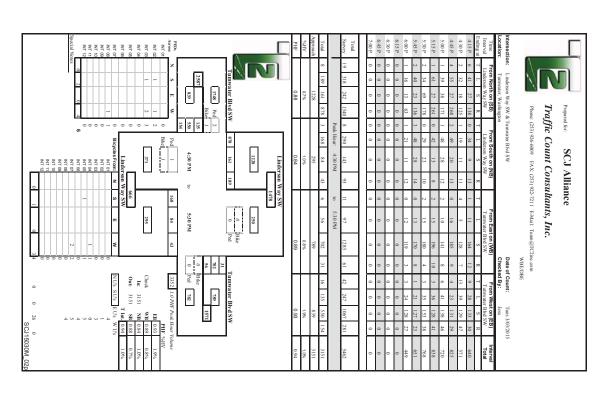
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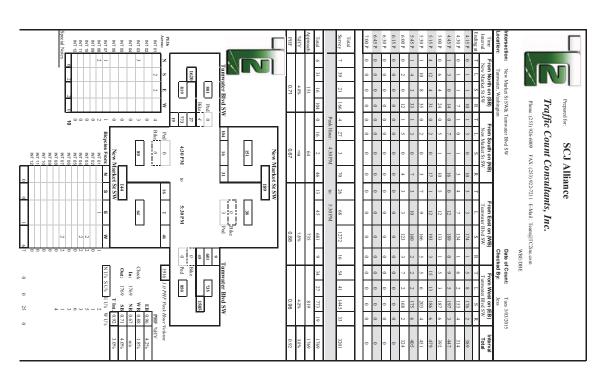
Traffic Count Consultants, Inc.

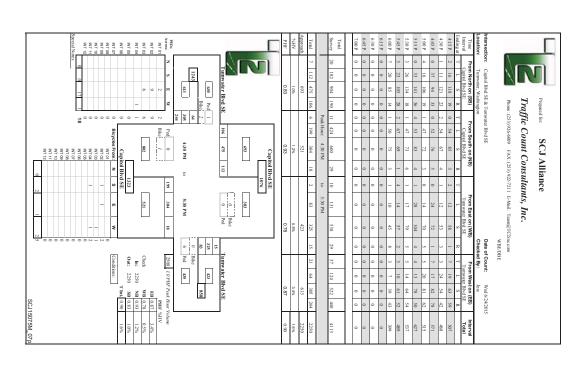
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

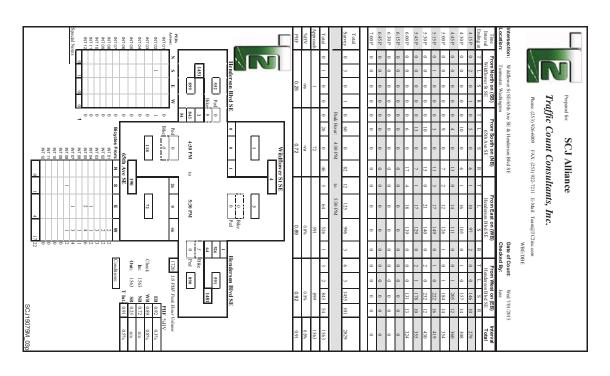
PIDA ACTOR A	PHF	%HV	Approach	Total		Total Survey	7:00 P	6:45 P	6:30 P	6:15 P	5:45 P	5:30 P	5:15 P	5:00 P	4:30 P	4:15 P	Ending at	Time	Location:
a z z			- 1	24	ŀ	4	0	+	Н	+	1 3	6	Н	∞ ⊍	+	+	Ξ,	From	
Tumwater Byd Sep Ped Sep Ped Bike 922 413		(3)	- 1	405	ı	797	0	+	Н	0 8	+	98	\vdash	102	+	Ť		From North on (SB) 1-5 SB Off Ramp	Tumwater, Washington
water Blvd sup Ped Blks Blks E W	0.93	3.6%		32	- 1	59 ,	0	+	Н	0	+	00	Н	0	+	+	S	on (SI	r, Wast
	H	H	┪	234	ŀ	423	0	٠	Н	0 2	+	8	Н	46	+	+	~	<u>u</u>	ungton
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	n/a	n/a	0	0	4:30 PM	0	0	0	0	0	0	0	0	0 0	0	0	s	I-5 SB On Ramp	
W On 405			ı	0		0	0	0	0	0 0	0	0	0	0 0	0	0	R	, NB	
GH 422			1	4	60	5	0	0	0	0 0	0	2	0	0 1	, 0	-	٦		1
ES 0 PM 0 0 Nd 00.5				319	5:30 PM	541	0	0	0	0	58	68	1112	62	60	69	L	From East on (WB)	
Bic	0.85	0.7%	594	275		510	0	0	0	0 00	99	65	63	58	60	53	S	ton (WB	
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	Г		1	-		4	0	0	0	0 2	, 0	0	0	- 0	0	_	-	-	Cliecked by.
Tumwater Bhd			ı	0		0	0	0	0	0 0	0	0	0	0 0	0	0	-	From West on (EB)	
FBlvd HF Peak NB NB NB NB NB NB NB NB NB N	0.90	0.2%	413	342	ı	636	0	0	0	0 8	70	96	2	90 %	3 79	60	s	est on	5000
k Hour PHF 1090 1091 1091			ı	71	ı	130	0	0	0	0 5	10	19	26	5 =	12	19	≂ ′	- (EB)	1
Tunwater BNd	0.94	1.7%	1678	1678		3096	0	0	0	0	343	414	445	383	359	379		Interval	





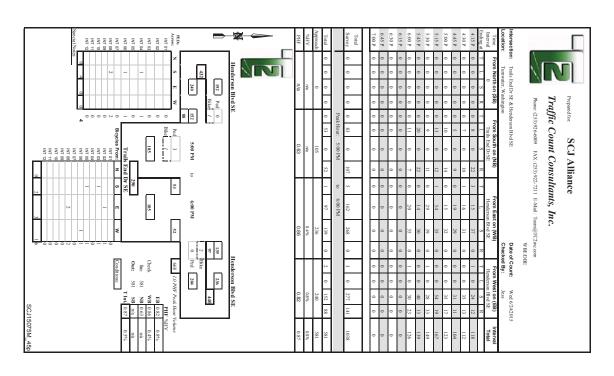


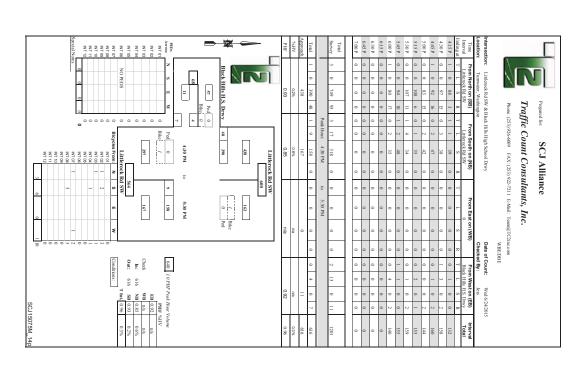


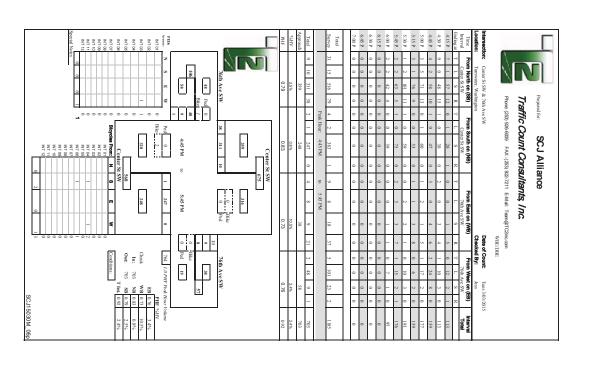


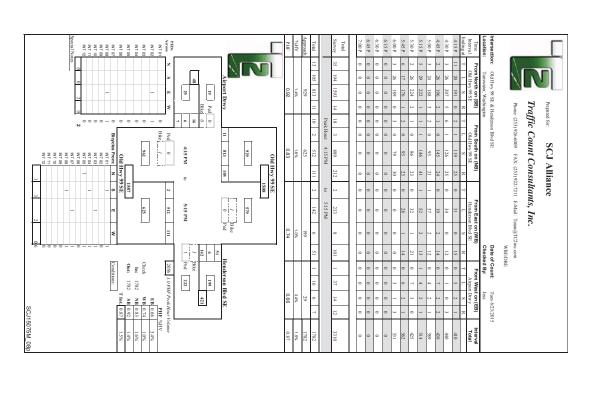


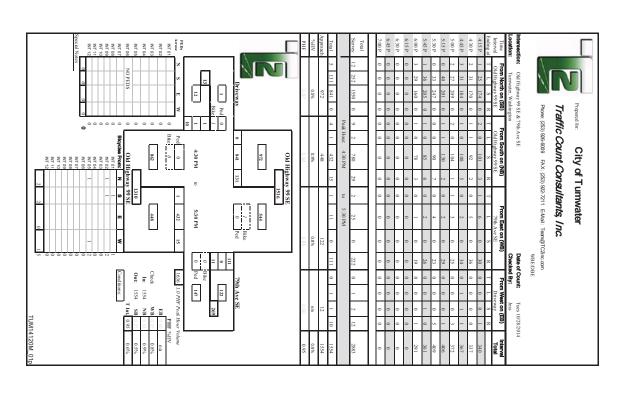
6:30 P 6:45 P PEDs
Across:
INT 0:
INT 1:
INT 1: 345 Ped 0 Bike 0 1008 663 651 Ped 0 Bike 0 520 Henderson Blvd SE 22 165 816 0 Bike 0 Ped 5:30 PM 1500 1.0 PHF Check In: 1370 Out: 1370

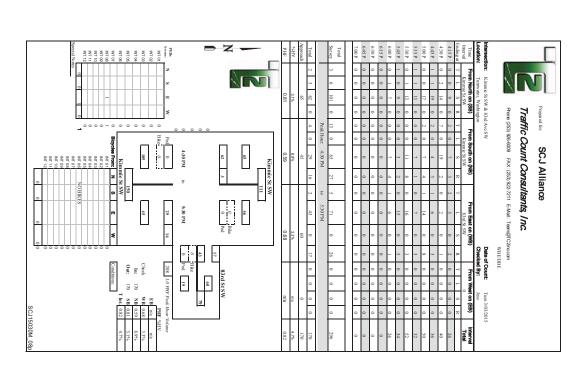


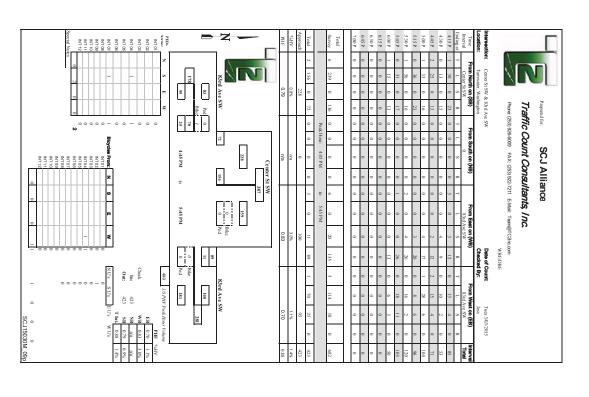


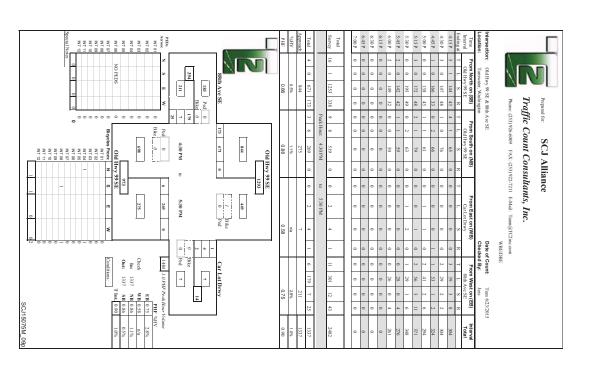


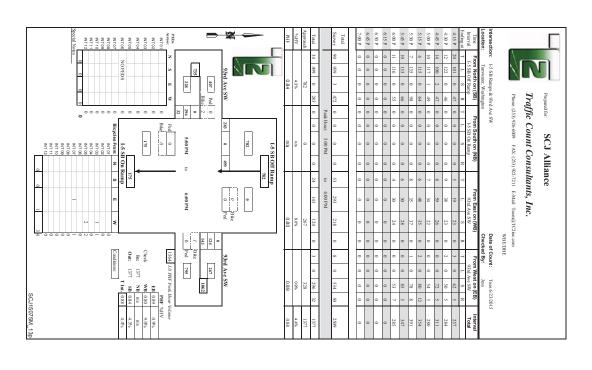














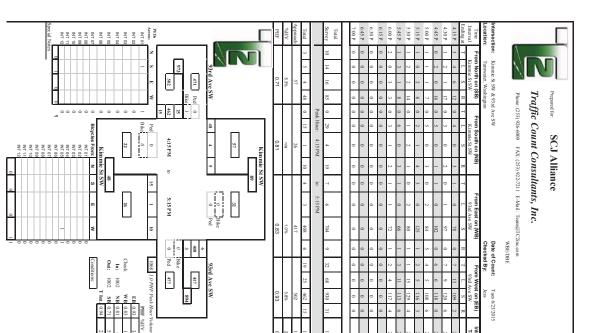
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WBE/DBE

				i		
on:	tion: 1-5 NB Ramps & 93rd Ave SW	tve SW	Date of	Date of Count:	Tues 6/23/2015	
-	Tunwater, Washington		Checke	Checked By:	Jess	
П	From North on (SB)	From South on (NB)	From East on (WB)	From West on (EB)	t on (EB)	Interval
	LS NB On Ramin	LS NB On Ramn	WS ave bare	9374 A	93rd Ave SW Total	Total

PEDS ACROSS NUTOS NUTOS NUTOS	%HV	Approach	Total		Total Survey	1.001	7:00 P	6:30 P	6:15 P	6:00 P	5:45 P	5:30 P	5:00 P	4:45 P	4:30 P	4:15 P	Interval
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93rd Ave SW 93rd Ave SW 1 1 1 1 1 1 W	n/a	0	0		0	<	0	0	0	0	0	0 0	0	0	0	0	I-5 NB On Ramp
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504 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0			23	Peak Hour:	48	╌	0	0	0	2	4	200	+	7	Ξ	00	١,
			47	1	70	٩	0	0	0	7	7	8 6	9	4	4	5	I-S NB
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0.0 PM S.530 PM			0	5:30 PM	0	<	0	0	0	0	0	0	0	0	0	0	93rd A
0.92 Bike	8.3%	590	251		440	4	0	0	0	47	48	67	47	70	52	42	93rd Ave SW
	ľ		339		6	ŀ	0 0	0	0	73	71	69	88	88		77	9
931 339 251 0 Bike 1 Ped Check	ł	+	+		648	ŀ	+	+	+	H		+	₩	Н	Н	Н	
			25 246		72 444	ŀ	0	+	+	12		ω σ	╀	10 2	Н	15 4	93rd Ave SW
890 Ave SI (1) PHF	62	, .			-	ŀ	0	+	0	⊢	Н	58	+	47 1	Н	Н	rd Ave
0.88 1207 1207 NB Control of the	3.3%	750	\vdash		1028	ŀ	0	+	0	⊢	Н	155	-	125		Ť	S W (E
Hour Volum PHF %HV 0.88 0.93 1.90 0.93	╀	+	0		0		0	0	0	0	0	0 0	0	0	0	0	~ 9
0.94 blume 3.3% 8.3% 14.4%	6.5%	1500	1500		2842	<	0 0	0	0	319	361	388	343	371	349	313	Total
4	8	18	ě		12								ľ			~	2 4



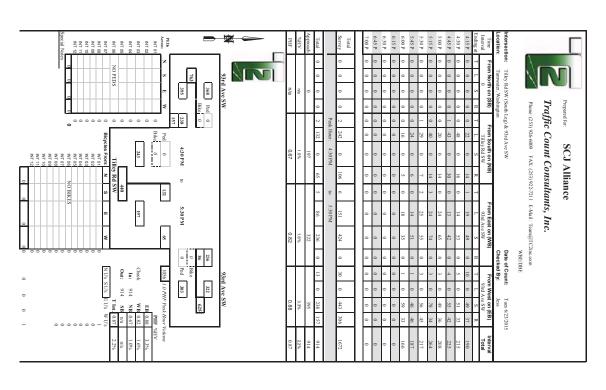


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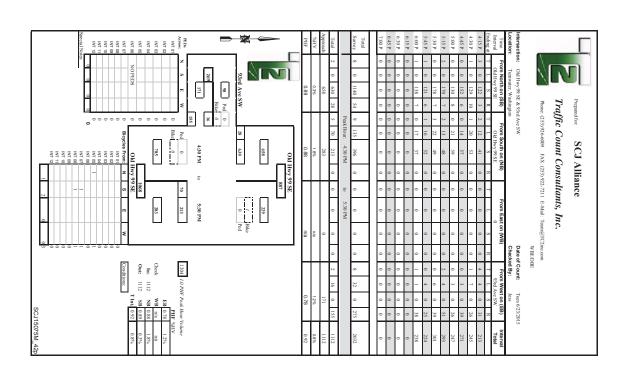
Phone (23) 926-6009 FAX: (23) 922-7211 E-Mail: Team@TC2ine.com
WBE/DBE

Ped Bike	92rd Ave SW 13/16 0 13/16 0 13/16 0 13/16 0 14:	PHF 0.74 C		100	Total	Total Survey 2 91 85 1 2 160	7:00 P 0 0 0 0 0 0 0	0 0 0 0 0	6:30 P 0 0 0 0 0 0 0	9 9 0	5:45 P 0 13 12 0 0 16	18 0	9 8 0 0	4:45 P 0 10 10 1 0 22	0 10 7 0 0	4:ISP 1 8 9 0 2 16		From North on (SB)	Intersection: Case Rd SW & 93rd Ave SW Location: Tunnwater, Washington	
se Rd SV	Case Rd SW 149 149 149 149 149 PM 16	0.88	n/a		4:30 PM 1	30 57	0 0 0	0	0 0	0 3	4 9	Н	= &	4 9	Н	1 6	S R	on (NB)		
82 19 V	0 Bkc				to 5:30 PM	8 104	0 0	H	0 0	t	0 20	3 13	t	1 14	0 12	1 9	93rd Ave SW	From East or		
32 0	0 0 54 28	0.84	1.9%	ŀ	795 78	520 47	0 0	Н	0 0	+	51 3	65 8	93 65	73 5	75 7	59 5	S W .	(WB)	Date of Count: Checked By:	
1196 1.0 1.0 1.0 1.0 1.0	93rd A			ŀ	13	29	0	Н	0 0	+	-	Н	2 2	5	6	9	T 93	From	Count:	
EB WB 1095 NB 1095 SB 1095 SB 1095 TInt.	93rd Ave SW 377 776 ke	0.91	2.5%	L	2 316	2 609	0 0	Н	0 0	+	0 70	0 91	+	0 77	0 69	0 73	93rd Ave SW	From West on (EB)	Tues	
			6	- 1	6 167	9 331	0	Н	0 0	+	46	42	+	43	44	38	R .	(EB)	Tues 6/23/2015 Jess	
Faur Volume PHF %HV 091 2.5% 0.84 1.9% 0.84 1.0% 0.74 1.0% 0.92 1.8%		0.92	1.8%	1095	1095	2037	0	0	0	215	244	274	254	268	259	224	Total	Interval	15	





NOT	93rd Ave SW 227 14 25 Biba 63 Biba 63 Biba 64:30 PM 10 5:30 PM	0.74 n/a	0.8% n/a	0	Peak Hour. 4.30 PM to 5.30 PM	Total 30 0 388 0 0 0 0 4 0 183 23	7:00 P 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		0 0 0 0 0 0 0 0 0 0 0		4 0 28 0 0 0 0 0 0 22	5:30P	1 3 0 78 0 0 0 0 2	0 2 0 55 0 0 0 0 0 0	0 4 0 40 0 0 0 0 0 0 15	4:SP 4 0 50 0 0 0 0 1 8 5	T L S R T L S R T L	Time Interval From North on (SB) From South on (NB) From East on (WB) Interval Tilley Rd SW 0 93rd Ave SW	ion: Tiley Rd SW (North Leg) & 93rd Ave SW : Tumwater, Washington		Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Toam@TC2mc.com	Traffic Count Consultants Inc	Prepared for SCJ AIII all CC
Tide	0 Bike	0.87	2.3%	303	112	23 19 192 358 0	H	0 0 0 0	0 0 0 0	0 0 0 0 0	0 1 14 53 0	2 0 15 47 0	3 2 25 62 0	3 3 34 36 0	4 2 39 45 0	22 22 23 38 43	R T L S R	From West on (EB) 93rd Ave SW	Date of Count: Tues 6/23/2015 Checked By: Jess	WBE/DBE	m/dTC) inc com		
2.8%, 2.8%, 0.8%, 1.8%,		0.86	1.8%	650	650	1174	0	0	0	0	122	128	189	165	147	142	Ш	Interval Total	L		—		



APPENDIX A-2INTERSECTION CRASH DATA

				1	1								T	
	PRIMARY	MILE	BLOCK				MOST SEVERE				#PED			
JURISDICTION		POST	NUMBER	INTERSECTING TRAFFICWAY	DATE	TIME	INJURY TYPE	# INJ	#FAT	#VEH	S	AL	JUNCTION RELATIONSHIP	FIRST COLLISION TYPE / OBJECT STRUCK
1 - R W Johns	on Blvd /Mot	tman R	d											
City Street	R W JOHNSON BL	VD 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 BL	VD 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 BL	VD 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
	R W JOHNSON BL		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 BL	VD 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
	MOTTMAN RD SV	V	3100	R W JOHNSON BLVD SW	8/7/2014		Possible Injury	1	0	2	0	0	At Intersection and Related	Entering at angle
City Street	MOTTMAN RD SV	V	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
	MOTTMAN RD SV	V	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 Blv	d /Mottman I	Rd					, ,						•	
	CROSBY BLVD SW		1000	MOTTMAN RD SW	11/16/2011	12:00	Possible Injury	1	0	2	0	0	At Driveway within Major Intersection	Entering at angle
	CROSBY BLVD SW		1000	INOTTIVIAN RD 3W					0			0		
City Street	CROSBY BLVD SW		1000		9/9/2013 12/26/2013		No Injury	0	0	3	0	0	Driveway Related but Not at Driveway	From same direction - both going straight - one stopped - rear-end
	CROSBY BLVD SW		1000		6/27/2013		No Injury No Injury	0	0		0	_		Entering at angle
								0		2	0	0	At Driveway	From opposite direction - one left turn - one straight From same direction - one left turn - one straight
	CROSBY BLVD SW		1000		1/9/2014	22:50	No Injury		0	2	-	_	At Driveway	ü
	CROSBY BLVD SW MOTTMAN RD SV		1000 1700	CDOCDY DIVID CIT	6/16/2014	15:00	No Injury	0	0	1	0	0	At Driveway	Fire Hydrant
,				CROSBY BLVD SW	10/9/2010		Evident Injury	2		2		_	At Intersection and Related	Entering at angle
,	MOTTMAN RD SV MOTTMAN RD SV		1700		1/14/2010		No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
,			1100		12/4/2014		No Injury	0	0	2	-	0	At Driveway	Entering at angle
State Route	101LX36642	0.24			11/18/2013		No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
State Route	101LX36642	0.24			11/20/2013		No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
	101LX36642	0.24			11/3/2014		No Injury	0	0	2	0	0		Entering at angle
	101LX36642	0.24			9/2/2014		Possible Injury	1	0	2	0	0		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		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		No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
	101LX36642	0.24			12/2/2013		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		No Injury	0	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - both moving - sideswipe
	101LX36642	0.24			10/15/2011		Possible Injury	1	0	2	0	0		From same direction - both going straight - one stopped - rear-end
State Route	101LX36642	0.24			1/19/2013		No Injury	0	0	2	0	0		Entering at angle
	101LX36642	0.24			5/10/2010		No Injury	0	0	3	0	0	At Driveway within Major Intersection	From opposite direction - one left turn - one straight
	101LX36642	0.24			6/1/2012		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		No Injury	0	0	2	0	0	At Driveway within Major Intersection	From opposite direction - one left turn - one straight
	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
	101LX36642	0.24			9/4/2012		No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
	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
	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
	101LX36642	0.24	l		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 Blv	d/Irving St													
,	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
	CROSBY BLVD SW		2800	IRVING ST SW	11/22/2010		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
	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		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
	IRVING ST SW		1400		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	,	1		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

	PRIMARY	MILE	BLOCK				MOST SEVERE				#PED	#PED		
JURISDICTION	TRAFFICWAY	POST	NUMBER	INTERSECTING TRAFFICWAY	DATE	TIME	INJURY TYPE	# INJ	#FAT	#VEH	S	AL	JUNCTION RELATIONSHIP	FIRST COLLISION TYPE / OBJECT STRUCK
5 - Crosby B	lvd/Barnes Blvd	d												
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
6 - Black Lal	ce Blvd/Black La	ake Beli	more Rd											<u> </u>
City Street	BLACK LAKE BLVD		3510		3/2/2012	14:21	No Injury	0	0	2	0	0	At Driveway	Entering at angle
City Street	BLACK LAKE BLVD		3400		7/7/2010		No Injury	0	0	2	0	0	At Driveway	From same direction - one left turn - one straight
	nson Blvd /Sapp				, , , , , ,		- /- /							
City Street	R W JOHNSON BL		4600	SAPP RD SW	8/24/2012	2.34	No Injury	0	0	1	0	0	At Intersection and Related	Tree or Stump (stationary)
	Crosby Blvd		1000	574.7.10.500	0/2:/2012	2.5	.10ju. y	Ŭ	Ū				remersection and neighbor	Tree or stamp (stationary)
City Street	SAPP RD SW		2000	CROSBY BLVD SW	4/25/2011	C-20	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
				CROSBY BLVD SW	4/25/2011	6:30	NO INJURY	U	U	2	U	U	At intersection and Related	Entering at angle
	/Black Lake Be	imore F	Ka .	DI ACIVI AVE DELL'ACCE DE TOTAL	0/0/000		Describile 1.1			_	-	_	Tax to the control of	Terror and a second sec
City Street	49TH AVE SW		2700	BLACK LAKE BELMORE RD SW	8/8/2011		Possible Injury	1	0	2	0		At Intersection and Related	From same direction - one left turn - one straight
City Street	49TH AVE SW	<u> </u>	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
	Blvd at Carlyon												1	
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
11 -Deschut	es Way / I-5 NE	3 On-Ra	mp											
12 -Deschut	es Way /US 10:	1 WB O	n-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
13 -I-5/US 1	01 Off-Ramp at	t Desot	o 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		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		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		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		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		Evident Injury	2	0	2	0	0	At Intersection and Related	Entering at angle
State Route	005R110435	0.30			11/19/2012		No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
State Route	005R110435	0.30			12/9/2010		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		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		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		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
	e/Custer Way													
City Street	CUSTER WAY SW		100	N 2ND AVE SW	2/10/2010		Possible Injury	1	0	2	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		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		ļ	CUSTER WY	11/2/2011		No Injury	0		1	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
	St /Custer Way													
City Street	CUSTER WAY SW		100	BOSTON ST SE	2/19/2012		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		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		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		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
	tes Way/Bosto	n 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		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		Possible Injury	1	0	2	0	0		From same direction - both going straight - one stopped - rear-end
City Street	BOSTON ST SE		3600	DESCHUTES WAY SW	4/1/2014		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		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				10/29/2011	16:49	No Injury	0	0	2	0	0	At Driveway	Entering at angle
17 Clavela	nd Ave /Capito	Loter												

UIDICDICTION	PRIMARY	MILE	BLOCK	INTERCECTING TRAFFICIALAY	DATE	T10.05	MOST SEVERE					#PED		FIRST COLLICION TYPE / ODJECT STOLICY
JURISDICTION ity Street	TRAFFICWAY	POST	NUMBER	INTERSECTING TRAFFICWAY CAPITOL BLVD	DATE 9/10/2014	TIME	INJURY TYPE Evident Injury	# INJ	#FAT 0	#VEH	S 1	AL 0	JUNCTION RELATIONSHIP At Intersection and Related	FIRST COLLISION TYPE / OBJECT STRUCK
ty Street ty Street	CLEVELAND AVE	C E	500	CAPITOL BLVD S	11/15/2013		No Injury	0	0	2	0	0	At Intersection and Related At Intersection and Related	Vehicle turning right hits pedestrian
	CLEVELAND AVE		500	CAPITOL BLVD S	9/4/2013			1	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
ity Street ity Street	CLEVELAND AVE		500	CAPITOL BLVD S	9/26/2014		Possible Injury No Injury	0	0	2	0	0	At Intersection and Related At Intersection and Related	From same direction - both going straight - one stopped - rear-end From same direction - both going straight - one stopped - rear-end
			300	CAPITOL BLVD 3	9/20/2014	16.00	NO IIIJUI Y	U	U	2	U	U	At littersection and Related	From same direction - both going straight - one stopped - rear-end
	/ay /Capitol Bl	va	2500	CUCTED WAY CE	2/0/2011	0.47	No. 1-1-1	_	_	_	١.,		Tax to the second Bulletin	Terror and the state of the sta
ity Street	CAPITOL BLVD S		3500	CUSTER WAY SE	2/8/2014		No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
ity Street	CAPITOL BLVD S		2200	CUSTER WAY SE	1/6/2012		No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
ity Street	CAPITOL BLVD S		3300	CUSTER WAY SE	8/9/2010		No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
ty Street	CAPITOL BLVD S		3400	CUSTER WAY SE	9/19/2014		No Injury	0	0	2	0	0	At Intersection and Related	Same direction both turning right one stopped rear end
ty Street	CAPITOL BLVD S		3300	CUSTER WAY SW	9/22/2012		Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - one right turn - one straight
ty Street	CAPITOL BLVD S		3300	CUSTER WAY SW	1/22/2011		No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
ity Street	CAPITOL BLVD S		2.400	CUSTER WY SW	10/11/2011		No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
ty Street	CAPITOL BLVD S		3400		7/29/2010		No Injury	0	0	2	0	0	Intersection Related but Not at Intersection	From same direction - both going straight - one stopped - rear-end
ty Street	CUSTER WAY		300	CAPITOL BLVD S	8/20/2011		No Injury	0	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - one stopped - rear-end
ty Street	CUSTER WAY SE		400	CAPITOL BLVD S	9/11/2014		No Injury	0	0	2	0	0	At Intersection and Related	From same direction - one left turn - one straight
ty Street	CUSTER WAY SE		400	CAPITOL BLVD S	8/13/2013		No Injury	0	0	2	0	0	At Intersection and Related	From same direction - one left turn - one straight
ity Street	CUSTER WAY SE		400	CAPITOL BLVD S	12/18/2013		Possible Injury	1	0	3	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
ty Street	CUSTER WAY SE		400	CAPITOL BLVD S	5/20/2014		No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
ity Street	CUSTER WAY SW		300	CAPITOL BLVD S	6/30/2010		No Injury	0	0	1	0	1	At Intersection and Related	Vehicle - Pedalcyclist
ity Street	CUSTER WAY SW		300	CAPITOL BLVD S	9/15/2012		No Injury	0	0	2	0	0	At Intersection and Related	From same direction - all others
ity Street	CUSTER WAY SW		300	CAPITOL BLVD S	7/27/2013		Possible Injury	2	0	2	0	0	At Intersection and Related	From same direction - one left turn - one straight
ity 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
ity 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
9 - Custer W	/ay /North St a	at Cleve	land Ave	!										
ity 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 - sideswip
ity 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 - sideswip
ity 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
ity 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
ity Street	CUSTER WAY SE		500	CLEVELAND AVE SE	12/14/2014		No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
ity Street	CUSTER WAY SE		500	CLEVELAND AVE SE	10/22/2012		Possible Injury	2	0	2	0	0	At Intersection and Related	Entering at angle
ity Street	CUSTER WAY SE		500	CLEVELAND AVE SE	5/21/2010		No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - both moving - sideswip
ity Street	CUSTER WAY SE		500		2/11/2011		No Injury	0	0	2	0	0	Intersection Related but Not at Intersection	From same direction - both going straight - one stopped - rear-end
ity Street	NORTH ST SE			CLEVELAND AV SE	10/11/2011		Evident Injury	2	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
ity Street	NORTH ST SE		300	CLEVELAND AVE SE	1/21/2011		Possible Injury	2	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
ity Street	NORTH ST SE		200	CLEVELAND AVE SE	9/1/2011		No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - sideswip
ity Street	NORTH ST SE			CLEVELAND AVE SE	3/14/2013		No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
ty Street	NORTH ST SE		300	CLEVELAND AVE SE	2/5/2013		Possible Injury	1	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
ty Street	CLEVELAND AVE S	SE	500	NORTH ST	9/24/2013		No Injury	0	0	2	0	0	At Driveway within Major Intersection	Entering at angle
ty Street	CLEVELAND AVE		400	NORTH ST SE	9/25/2013		Possible Injury	1	0	2	0	0	At Intersection and Related	Entering at angle
ty Street	CLEVELAND AVE		200	NORTH ST SE	9/16/2011		No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
ty Street	CLEVELAND AVE		400	NORTH ST SE	10/6/2013		Possible Injury	1	0	1	1	0	At Intersection and Related	Vehicle going straight hits pedestrian
ity Street	CLEVELAND AVE		.50	NORTH ST SE	3/17/2012		No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
ity Street	CLEVELAND AVE		400	NORTH ST SE	8/28/2013		No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
0 - Hoadly S		<i></i>	-00	NOMINI ST SE	0/20/2013	10.43	ivo injury	U	U			U	Actinici section and nelated	Trom opposite unection - one iere turn - one straight
			000	1	F /22 /2012	46.50	No. 1-1-1	_	_	_	١.,		Tax 8.1	Francisco d'accesso hack action destricts
ity Street	NORTH ST SE		800	1	5/23/2012		No Injury	0	0	2	0	0	At Driveway	From same direction - both going straight - one stopped - rear-end
ty 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

	1	1											1	1
	PRIMARY	MILE	BLOCK				MOST SEVERE				#PED			
JURISDICTION	TRAFFICWAY	POST	NUMBER	INTERSECTING TRAFFICWAY	DATE	TIME	INJURY TYPE	# INJ	#FAT	#VEH	S	Α	L JUNCTION RELATIONSHIP	FIRST COLLISION TYPE / OBJECT STRUCK
23 - Cleveland	d Ave / South	St												
City Street	CLEVELAND AVE S	SE	4200	SOUTH ST SE	8/25/2014	18:37	Possible Injury	1	0	2	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	(At Intersection and Related	Entering at angle
24 - 7th Ave /	/ Linwood Ave	:												
City Street	LINWOOD AVE SV	N	400	S 7TH AVE SW	4/28/2013	21:41	Possible Injury	1	0	2	0	(At Intersection and Related	Entering at angle
	LINWOOD AVE SV		400	S 7TH AVE SW	5/7/2010	17:36		2	0	2	0	_	At Intersection and Related	Entering at angle
	LINWOOD AVE SV		100	S 7TH AVE SW	5/12/2014		Unknown	0	0	1	0		At Intersection and Related	Fence
	/ Linwood Ave			-								•		
	LINWOOD AVE SV			S 2ND AVE SW	12/20/2013	17.24	No Injury	0	0	2	0		At Intersection and Related	Entering at angle
	LINWOOD AVE SV			S 2ND AVE SW	10/10/2012	16:08		1	0	2	0			Entering at angle
	LINWOOD AVE SV		300	S 2ND AVE SW	11/13/2012						0	_		0 0
City Street	LINWOOD AVE SV			S 2ND AVE SW	3/27/2014		No Injury No Injury	0	0	3	0	_		Entering at angle
	S 2ND AVE SW	rv	300	S 2ND AVE SW LINWOOD AVE SW	3/2//2014 4/10/2014		No Injury No Injury	0	0	2	0		At Intersection and Related At Intersection and Related	From opposite direction - one left turn - one right turn Entering at angle
	S 2ND AVE SW		1000	LINWOOD AVE SW	6/27/2010			1	0	2	0	_	At Intersection and Related At Intersection and Related	<u> </u>
City Street			1000				Possible Injury				0	_		From same direction - both going straight - both moving - sideswipe
City Street	S 2ND AVE SW		1000	LINWOOD AVE SW	10/19/2013		No Injury	0	0	2		_		From same direction - both going straight - one stopped - rear-end
City Street	S 2ND AVE SW		1000	LINWOOD AVE SW	4/12/2011		No Injury	0	0	2	0		At Intersection and Related	Entering at angle
City Street	S 2ND AVE SW		1000	LINWOOD AVE SW	11/25/2014		No Injury	0	0	2	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		Possible Injury	1	0	2	0		At Intersection and Related	Entering at angle
	S 2ND AVE SW		1000		12/3/2013	9:40	No Injury	0	0	2	0	1 (At Driveway	Entering at angle
	lvd / Linwood	Ave					1						T-	
City Street	CAPITOL BLVD SE		4000	LINWOOD AVE SW	11/1/2013		No Injury	0	0	1	0	_	At Intersection and Related	Bridge Abutment
	CAPITOL BLVD SE		4700	LINWOOD AVE SW	3/2/2012		Possible Injury	1	0	2	0	_	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
	CAPITOL BLVD SE			LINWOOD AVE SW	7/29/2011		No Injury	0	0	3	0	_	At Intersection and Related	From same direction - both going straight - one stopped - sideswipe
	CAPITOL BLVD SV			LINWOOD AVE SW	3/30/2013		No Injury	0	0	2	0	(From opposite direction - one left turn - one straight
City Street	CAPITOL BLVD SV	V	4100	LINWOOD AVE SW	11/21/2014	12:27	Possible Injury	1	0	2	0	(At Intersection and Related	From opposite direction - one left turn - one straight
	CAPITOL BLVD SV			LINWOOD AVE SW	5/3/2014		No Injury	0	0	2	0	_	At Intersection and Related	From opposite direction - one left turn - one straight
	LINWOOD AVE SV			CAPITOL BLVD SE	8/3/2010		Possible Injury	1	0	2	0	_	At Intersection and Related	Entering at angle
City Street	LINWOOD AVE SV	V		CAPITOL BLVD SW	11/20/2012	14:42	No Injury	0	0	2	0	(At Intersection and Related	Entering at angle
27 - Henderso	on Blvd / Yelm	1 Hwy												
City Street	HENDERSON BLV	D SE	4600	YELM HWY SE	9/20/2014	21:22	Evident Injury	2	0	2	0	(At Intersection and Related	Entering at angle
City Street	HENDERSON BLV	D SE	4500	YELM HWY SE	8/31/2012	14:55	No Injury	0	0	2	0	(At Intersection and Related	From opposite direction - one left turn - one straight
City Street	HENDERSON BLV	D SE		YELM HWY SE	9/21/2014		No Injury	0	0	2	0	(At Intersection and Related	From opposite direction - one left turn - one straight
City Street	HENDERSON BLV	D SE	4500	YELM HWY SE	11/24/2010	13:40	No Injury	0	0	3	0	(At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	HENDERSON BLV	D SE	4500	YELM HWY SE	4/4/2011	6:59	Evident Injury	1	0	2	0	(At Intersection and Related	From same direction - all others
City Street	HENDERSON BLV	D SE	4500	YELM HWY SE	8/2/2013	21:41	No Injury	0	0	2	0	(At Intersection and Related	Same direction both turning right one stopped rear end
	HENDERSON BLV		4500	YELM HWY SE	12/18/2012		No Injury	0	0	2	0		At Intersection and Related	From opposite direction - one left turn - one straight
	HENDERSON BLV		4500	YELM HWY SE	8/9/2012		No Injury	0	0	2	0	(At Intersection and Related	Same direction both turning right one stopped rear end
City Street	HENDERSON BLV	D SE	4500	YELM HWY SE	12/31/2012	19:15	No Injury	0	0	2	0	(At Intersection and Related	From same direction - both going straight - one stopped - rear-end
	HENDERSON BLV			YELM HWY SE	10/31/2014		No Injury	0	0	2	0	_	At Intersection and Related	Same direction both turning right one stopped rear end
	HENDERSON BLV			YELM HWY SE	10/14/2013		No Injury	0	0	2	0	(At Intersection and Related	From same direction - both going straight - one stopped - rear-end
	HENDERSON BLV		1300	YELM HWY SE	11/19/2011		No Injury	0	0	2	0	(At Intersection and Related	Entering at angle
	HENDERSON BLV		4500	YELM HWY SE	4/23/2010	19:10	No Injury	0	0	2	0	-	At Intersection and Related	Entering at angle
City Street	HENDERSON BLV		4500	YELM HWY SE	10/19/2012	7:18	No Injury	0	0	2	0	_	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	HENDERSON BLV		4500	YELM HWY SE	4/17/2013		No Injury	0	0	2	0	(At Intersection and Related	Entering at angle
City Street	HENDERSON BLV		4500	YELM HWY SE	2/5/2013		No Injury	0	0	2	0		At Intersection and Related	From opposite direction - one left turn - one straight
	HENDERSON BLV		4600	YELM HWY SE	7/7/2014		No Injury	0	0	2	0	_	At Intersection and Related	Same direction both turning right one stopped rear end
City Street	HENDERSON BLV		4600	YELM HWY SE	1/9/2014		Possible Injury	2	0	2	0	_	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	HENDERSON BLV			YELM HWY SE	3/21/2014		Possible Injury	1	0	2	0	(Same direction both turning right one stopped rear end
	HENDERSON BLV		4500	YELM HWY SE	5/13/2010		Possible Injury	1	0	2	0	_	At Intersection and Related	From same direction - both going straight - both moving - rear-end
	HENDERSON BLV		4500	YELM HWY SE	6/30/2013		Possible Injury	1	0	2	0	_	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	YELM HWY			HENDERSON BLVD	7/21/2011		Possible Injury	2	0	2	0	(At Intersection and Related	From opposite direction - one left turn - one straight
	YELM HWY SE		1700	HENDERSON BLVD SE	9/22/2010		Evident Injury	1	0	1	0	_	At Intersection and Related	Vehicle - Pedalcyclist
	YELM HWY SE		1700	HENDERSON BLVD SE	4/30/2010		No Injury	0	0	2	0	_	At Intersection and Not Related	From same direction - both going straight - both moving - rear-end
	YELM HWY SE		00	HENDERSON BLVD SE	10/17/2014		No Injury	0	0	2	0			From opposite direction - one left turn - one straight
	YELM HWY SE		1700	HENDERSON BLVD SE	3/7/2014		Evident Injury	2	0	2	0	_	At Intersection and Related At Intersection and Related	From opposite direction - one left turn - one straight
	YELM HWY SE		_,	HENDERSON BLVD SE	3/21/2014	7:50	No Injury	0	0	2	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			Entering at angle
City Street	YELM HWY SE		1700	HENDERSON BLVD SE	3/17/2014		Possible Injury	2	0	2	0	_	At Intersection and Related At Intersection and Related	From opposite direction - one left turn - one straight
	. CLIVI II VV I JL		1,00									-		
	YELM HWY SE		1700	HENDERSON BLVD SE	1///2010		Possible Iniury	1	n	7) IAt Intersection and Related	IFrom annosite direction - one left turn - one straight
City Street	YELM HWY SE YELM HWY SE		1700 1700	HENDERSON BLVD SE HENDERSON BLVD SE	1/4/2010 12/10/2014		Possible Injury No Injury	0	0	2	0	_	At Intersection and Related At Intersection and Related	From opposite direction - one left turn - one straight Entering at angle

													T-	
	PRIMARY	MILE	BLOCK				MOST SEVERE				#PFC	#P	FD	
JURISDICTION	TRAFFICWAY	POST	NUMBER	INTERSECTING TRAFFICWAY	DATE	TIME	INJURY TYPE	# INI	#FAT	#VEH	ı s	Α		FIRST COLLISION TYPE / OBJECT STRUCK
	YELM HWY SE	1001	1700	HENDERSON BLVD SE	5/3/2013		Possible Injury	1	0	2	0		At Intersection and Related	From same direction - both going straight - one stopped - rear-end
/	YELM HWY SE		1700	HENDERSON BLVD SE	11/24/2010		No Injury	0	0	2	0			From same direction - both going straight - both moving - rear-end
	YELM HWY SE		1700	HENDERSON BLVD SE	9/25/2010		Possible Injury	1	0	2	0			From same direction - both going straight - both moving - rear-end
	YELM HWY SE		1700	HENDERSON BLVD SE	9/25/2010			0	0	2	0			
							No Injury					_		From opposite direction - one left turn - one straight
	YELM HWY SE		1700	HENDERSON BLVD SE	7/12/2010	18:06	No Injury	0	0	3	0	_	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
	YELM HWY SE		1700	HENDERSON BLVD SE	7/13/2012	13:44	Possible Injury	1	0	2	0	(At Intersection and Related	Entering at angle
28 - Rural Rd	/ Trosper Rd													
City Street	TROSPER RD SW		2100	RURAL RD SW	5/27/2010	17:46	Possible Injury	1	0	2	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	(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	(At Intersection and Related	Entering at angle
	TROSPER RD SW		2100	RURAL RD SW	3/13/2012		No Injury	0	0	2	0	(Entering at angle
29 - Lake Park		Pd			3, 23, 232		,,	-						
		nu			6/1/0010	4= 0=				_			The state of the state of	le
/	TROSPER RD SW		800	LAKE PARK DR SW	6/1/2012		No Injury	0	0	2	0	_	At Intersection and Related	Entering at angle
	TROSPER RD SW		800	LAKE PARK DR SW	11/11/2013		Possible Injury	2	0	2	0		At Intersection and Related	From opposite direction - one left turn - one straight
	TROSPER RD SW		800	LAKE PARK DR SW	9/17/2013		Possible Injury	1	0	2	0	(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	k Rd / Trosper	Rd												
	LITTLEROCK RD S		5300	TROSPER RD SW	12/8/2013	17:09	Possible Injury	2	0	2	0	(At Intersection and Related	From opposite direction - one left turn - one right turn
	LITTLEROCK RD S		5300	TROSPER RD SW	1/9/2013		No Injury	0	0	2	0			From same direction - both going straight - both moving - sideswipe
	LITTLEROCK RD S		5300	TROSPER RD SW	12/6/2012		No Injury	0	0	2	0	(From same direction - both going straight - one stopped - rear-end
	LITTLEROCK RD S		5300	TROSPER RD SW	7/20/2013		Possible Injury	1	0	2	0			From same direction - both going straight - one stopped - rear-end
,	LITTLEROCK RD S		5300	TROSPER RD SW	10/7/2011		Possible Injury	1	0	2	0		At Intersection and Related	From same direction - both going straight - both moving - sideswipe
	LITTLEROCK RD S		5300	TROSPER RD SW	1/29/2010		No Injury	0	0	2	0	_	At Intersection and Related	
											_	_		From same direction - both going straight - both moving - sideswipe
	LITTLEROCK RD S		5300	TROSPER RD SW	5/18/2013		No Injury	0	0	2	0	_	At Intersection and Related	From opposite direction - one left turn - one straight
	LITTLEROCK RD S		5300	TROSPER RD SW	9/12/2012		No Injury	0	0	2	0	_	At Intersection and Related	From same direction - both going straight - both moving - sideswipe
	LITTLEROCK RD S		5300	TROSPER RD SW	2/3/2014		No Injury	0	0	2	0		At Intersection and Related	From same direction - all others
	LITTLEROCK RD S		5300		3/18/2010		No Injury	0	0	2	0	_	At Driveway	Entering at angle
	LITTLEROCK RD S	W	5300		4/17/2012		No Injury	0	0	2	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	(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	(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	(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	(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	(At Intersection and Related	Entering at angle
City Street	TROSPER RD SW		600	LITTLEROCK RD SW	10/25/2010		No Injury	0	0	2	0	(At Intersection and Related	Entering at angle
City Street	TROSPER RD SW		600	LITTLEROCK RD SW	9/27/2013		No Injury	0	0	2	0	(At Intersection and Related	Entering at angle
	TROSPER RD SW		600	LITTLEROCK RD SW	8/14/2010		No Injury	0	0	2	0	_	At Driveway within Major Intersection	Entering at angle
	LITTLEROCK RD S		5300	ETT EETTO ON THE OW	12/30/2013		No Injury	0	0	2	0	_	At Driveway	From opposite direction - one left turn - one straight
	LITTLEROCK RD S		5300		11/10/2014		No Injury	0	0	2	0		At Driveway	Entering at angle
/	LITTLEROCK RD S		5300		10/14/2012		No Injury	0	0	2	0	_	At Driveway	Entering at angle
			5300		11/9/2013			0						
	LITTLEROCK RD ST						No Injury		0	2	0	_	At Driveway	Entering at angle
	LITTLEROCK RD S		5300		2/10/2010		Possible Injury	1	0	2	0	(Entering at angle
	LITTLEROCK RD S		5300		11/6/2011		No Injury	0	0	2	0	_	At Driveway	Entering at angle
,	LITTLEROCK RD S			S 2ND AVE SW	12/1/2014		No Injury	0	0	2	0	(From opposite direction - one left turn - one straight
	LITTLEROCK RD S		5300		9/24/2012		No Injury	0	0	1	0	_	At Driveway	Fence
	LITTLEROCK RD S	W	5300		7/26/2012		Possible Injury	1	0	2	0		At Driveway	Entering at angle
	S 2ND AVE SW		500	TROSPER RD SW	11/24/2011		No Injury	0	0	2	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	(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	(At Driveway within Major Intersection	Entering at angle
City Street	TROSPER RD SW		600	S 2ND AVE SW	8/26/2011		Possible Injury	3	0	2	0	(At Intersection and Related	From same direction - both going straight - one stopped - rear-end
31 - I-5 SB Rar	mps/Tyee Dr	at Trosr	er Rd		-									
	005LX10279	0.02			10/7/2014	12.26	Possible Injury	2	0	3	0	(At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Poute		0.02			6/18/2012			0	0	2	0			Entering at angle
		0.02					No Injury				_	_		0 0
State Route	005LX10279		1	1	5/1/2013		Possible Injury	3	0	3	0		At Intersection and Related	From same direction - both going straight - both moving - rear-end
State Route State Route	005LX10279					13:58	No Injury	0	0	3	0	(At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route State Route State Route	005LX10279 005LX10279	0.02			11/14/2014									
State Route State Route State Route State Route	005LX10279 005LX10279 005LX10279	0.02			10/23/2010		No Injury	0	0	2	0		At Intersection and Related	Entering at angle
State Route State Route State Route State Route State Route State Route	005LX10279 005LX10279 005LX10279 005LX10279	0.02 0.02 0.02			10/23/2010 10/13/2012	14:35	No Injury	0	0	2	0	(At Intersection and Related	Entering at angle Entering at angle
State Route	005LX10279 005LX10279 005LX10279 005LX10279 005LX10279	0.02 0.02 0.02 0.02			10/23/2010 10/13/2012 2/9/2012	14:35 17:38	No Injury Possible Injury	0	0	2	0	(At Intersection and Related At Intersection and Not Related	Entering at angle Entering at angle From same direction - both going straight - both moving - rear-end
State Route	005LX10279 005LX10279 005LX10279 005LX10279	0.02 0.02 0.02			10/23/2010 10/13/2012	14:35 17:38	No Injury	0	0	2	0	(At Intersection and Related	Entering at angle Entering at angle
State Route	005LX10279 005LX10279 005LX10279 005LX10279 005LX10279	0.02 0.02 0.02 0.02			10/23/2010 10/13/2012 2/9/2012	14:35 17:38 13:30	No Injury Possible Injury	0	0	2	0	(At Intersection and Related At Intersection and Not Related	Entering at angle Entering at angle From same direction - both going straight - both moving - rear-end

State Route		1			,									1	
INSECTION INSECTION TANKING INSECTION INSECT															
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ASSECTION THEORY THE CALLIES OF THE STATE A STATE OF STATE A STATE OF STAT		PRIMARY	MILE	BLOCK				MOST SEVERE				#PFD	#PFD		
See No. 1995 1995	JURISDICTION	TRAFFICWAY	POST	NUMBER	INTERSECTING TRAFFICWAY	DATE	TIME	INJURY TYPE	# INJ	#FAT	#VFH			JUNCTION RELATIONSHIP	FIRST COLLISION TYPE / OBJECT STRUCK
See December Dec												0			·
September 10,000,000 10,															
Size Subst													-		
Size Report Size															
See Found SQUALICY GUZ MAY SQUALICY Company				1									-		
See Note												-	-		
State button															
Size Foliate SCALIGNT9 COS													_		
Size Region															ů i
Size Reside													Ů		
Size Royal SSEN_193772													_		
Size Found															
State Books	State Route												-		From same direction - both going straight - one stopped - rear-end
Seek boute S051,03779 0.00 0.	State Route	005LX10279					12:51	No Injury					0	At Driveway within Major Intersection	Entering at angle
State Name	State Route												0		Entering at angle
State Note	State Route	005LX10279				12/21/2010	17:55	Possible Injury			2	0	0	At Intersection and Not Related	From same direction - both going straight - one stopped - rear-end
State Nove	State Route		0.02				19:09	Possible Injury		0	2	0	0	At Intersection and Not Related	From opposite direction - both going straight - sideswipe
State Note 005.1312979 0.02 915/20101 11.518 to https:// to 1	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
Size Note DSSXXXXXXYP DOS DSXXXXXXYP DOS DSXXXXXXXYP DOS DSXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	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					3	0	0	At Intersection and Not Related	
State Route	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	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	State Route	005LX10279	0.02			8/25/2011			0	0		0	0	At Intersection and Related	
State Route															
State Boxe													_		
State Route													_		
State Route															
State Route 05XXXXXXYY 0.02 9/36/2013 14.40 for longury 0 0 2 0 0 0 At Intersection and Related From same direction - both gaing straight - one stopped - rear-end State Route 05XXXXXYYY 0.02 9/10/2014 17.37] (Evident Injury 1 0 3 0 0 At Intersection and Related From same direction - both gaing straight - one stopped - rear-end State Route 05XXXXXYYY 0.02 9/15/2013 14.29 for Injury 0 0 2 0 0 At Intersection and Related From same direction - both gaing straight - one stopped - rear-end State Route 05XXXXXYYY 0.02 9/15/2013 14.29 for Injury 0 0 0 2 0 0 At Intersection and Related From same direction - both gaing straight - one stopped - rear-end State Route 05XXXXXYY 0.02 0.03 3/13/2013 17.20 for State Route 05XXXXXXYY 0.02 0 At Intersection and Related From same direction - both gaing straight - both moving - rear-end State Route 05XXXXXXYY 0.02 3/13/20/2013 18.29 for State Route 05XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX															
State Route															
Sate Route													-		
State Route 005X10279															
State Route 095L10279													-		
State Route 005X10279 0.02 8/12/2014 17:20 Possible Injury 1 0 2 0 0 Al Intersection and Not Related From same direction - both going straight - both moving - rear-end State Route 005X10279 0.02 8/12/2014 18:29 Possible Injury 1 0 1 0 1 Al Intersection and Related Vehicle - Pedalcyclist State Route 005X10279 0.02 8/12/2014 18:29 Possible Injury 1 0 1 0 1 Al Intersection and Related Vehicle - Pedalcyclist State Route 005X10279 0.02 9/14/2013 11:42 Possible Injury 0 0 2 0 0 Al Intersection and Related Vehicle - Pedalcyclist From same direction - both going straight - one stopped - rear-end State Route 005X10279 0.02 9/14/2013 17:27 No Injury 0 0 2 0 0 Al Intersection and Related From same direction - both going straight - one stopped - rear-end State Route 005X10279 0.02				1									·		
State Route 005\(\)\$10279 0.02 8\(\)\$12\(\)\$2013 145-54 Possible Injury 2 0 2 0 0 At Intersection and Related Vehicle - Pedicy				1											
State Route OSSLX10279 O.02 Sh12/2014 18.29 Possible Injury 1 O 1 O 1 At Intersection and Related Vehicle - Prediatyclist				1									-		
State Route			0.0-												
State Route 005X10279															
State Route 005S10303 0.28 7.71/2011 14.26 No Injury 0 0 2 0 0 0 Intersection and Related From same direction - both going straight - one stopped - rear-end State Route 005R110303 0.30 2.71/2011 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 8/18/2011 20.45 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 0.31 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 - one stopped - rear-end State Route 005R110303 0.32 3/7/2012 19.44 Possible 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 0 0 2 0 0 At Intersection and Related From same direction - both going straight - one stopped - rear-end State Route 005R110303 0.32 3/7/2012 19.44 Possible Injury 0 0 2 0 0 At Intersection and Related From same direction - both turning right - one stopped - rear-end State Route 005R110303 0.32 10.75/2010 12.53 No Injury 0 0 2 0 0 At Intersection and Related From same direction - both turning right - one stopped - rear-end State Route 005R110303 0.32 10.75/2010 12.53 No Injury 0 0 2 0 0 At Intersection and Related From same direction - both turning right - one stopped - rear-end State Route 005R110303 0.32 10.75/2010 14.25 No Injury 0 0 2 0 0 At Intersection and Related From same direction - both turning													-		
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 8/18/2011 16:20 No Injury 0 0 2 0 0 Intersection Related but Not at Intersection - 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 3/7/2012 12:39 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 3/7/2012 16:22 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 4/7/2011 16:22 No Injury 0 0 2 0 0 At Intersection and Related From same direction - both turning right - one stopped - rear-end State Route 005R110303 0.32 10/7/2012 12:38 No Injury 0 0 2 0 0 At Intersection and Not Related From same direction - both turning right - one stopped - rear-end State Route 005R110303 0.32 10/7/2012 14:25 No Injury 0 0 2 0 0 At Intersection and Not 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 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 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 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 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				1									-		
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 - one stopped - rear-end State Route 005R110303 0.32 4/7/2011 19:49 Possible Injury 0 0 2 0 0 At Intersection and Related Same direction - both going straight - one stopped - rear-end State Route 005R110303 0.32 10/5/2010 12:38 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 Related 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 going straight - both moving - sideswipe State Route 005R110303 0.32 5/21/2012 14:25 No Injury 0 0 2 0 0 At Intersection and Related Same direction - both going straight - both moving - sideswipe State Route 005R110303 0.32 5/21/2012 14:25 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 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 3/24/2011 12:26 Possible Injury 0 0 2 0 0 At Intersection and Related Same direction - both turning right - one stopped - rear-end State Route 005R110303 0.32 3/24/2011 12:26 Possible Injury 0 0 2 0 0 At Intersection and Related Same direction - both turning right - one stopped - rear-end State Route 005R110303 0.32 0.32 0.32												-	-		
State Route 005R110303 0.32 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 10/5/2012 12:38 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 10/7/2012 16:13 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 10/7/2012 16:13 No Injury 0 0 2 0 0 At Intersection and Related Same direction - both going straight - one stopped - rear-end State Route 005R110303 0.32 10/7/2012 14:25 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 14/19/2011 12:16 No Injury 0 0 2 0 0 At Intersection and Related From same direction - both turning right - one stopped - rear-end State Route 005R110303 0.32 14/19/2011 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 19/19/2011 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 19/19/2011 19/26 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 19/19/2011 19/26 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 19/19/2011 19/26 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 19/29/2011 19/2															
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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 14:25 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 14:25 No Injury 0 0 2 0 0 At Intersection and Related From same direction - both turning right - 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 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 0 0 2 0 0 At Intersection and Related Same direction - both turning right - one stopped - rear end State Route 005R110303 0.32 10/12/2014 11:40 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 10/12/2014 11:40 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 12/9/2011 12:26 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 12/9/2011 13:00 No Injury 0 0 2 0 0 At Intersection and Related Same direction - both turning right - one stopped - rear end State Route 005R10303 0.32 13/12/2014 13:00 No	State Route	005R110303					19:44	Possible Injury		0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
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				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 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 2/16/2011 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 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 turning right - 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 From same direction - both turning right - 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 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 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 Same direction - both turning right - one stopped - rear end State Route 005R10303 0.32 0 0 At Intersection	State Route		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 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 2/16/2011 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 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 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 Same direction - both turning right - one stopped - rear end State Route 005R110303 0.32 12/9/2011 11:40 No Injury 0 0 2 0 0 At Intersection and Related From same direction - both turning right - 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 From same direction - both turning right - 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 From 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 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 - rear-end State Route 005R10279 0.12 10/28/2013 17:15 No Injury 0 0 2 0 0 At Intersection Related but Not at Intersection From same direction - both going straight - one stopped - rear-end State Ro	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 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 8/24/2011 12:26 Possible Injury 0 0 2 0 0 At Intersection and Related Same direction - both turning right - one stopped - rear end State Route 005R110303 0.32 10/21/2014 11:40 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 10/21/2014 11:40 No Injury 0 0 2 0 0 At Intersection and Related From same direction - both turning right - 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 From same direction - both turning right - 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 12/9/2011 11:30 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 Same direction - both poing straight - both moving - rear-end State Route 005LX10279 0.12 10/28/2013 17:15 No Injury 0 0 2 0 0 At 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 - one stopped	State Route	005R110303	0.32			5/21/2012			0	0	2	0	0	At Intersection and Related	
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 10/21/2014 11:26 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 Same direction - both turning right - 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 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 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 Same direction - both going straight - 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 Same direction - both going straight - one stopped - rear-end State Route 005R110303 0.32 5/7/2010 11:35 No Injury 0 0 2 0 0 At 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 0.16 3/6/2012 14:52 No Injury 0 0 2 0 0 Intersection Related but Not at Intersection From same direction - both going straight - 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	
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 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 turning right - one stopped - rear-end State Route Same Intersection Same direction - both going straight - both moving - sideswipe Same Intersection Same Intersection Same direction - both going straight - one stopped - rear-end State Route Same Intersection Same Intersection Same direction - both going straight - one stopped - rear-end State Route Same Intersection Same direction - both going straight - one stopped - rear-end State Route South Same Intersection Same Intersection Same direction - both going straight - one stopped - rear-end State Route South Same Intersection Same In													0		
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 05R110303 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 - right - one stopped - rear-end State Route 05R110303 0.32 5/7/2010 14:10 No Injury 0 0 0 2 0 0 At Intersection and Related From same direction - both going straight - both moving - right - one stopped - rear-end State Route 05IX10279 0.12 5/7/2011 11:30 No Injury 0 0 0 2 0 0 At Driveway From opposite direction - both going straight - one stopped - rear-end State Route 05IX10279 0.12 5/7/2011 11:30 No Injury 0 0 0 2 0 0 Intersection Related but Not at Intersection From same direction - both going straight - one stopped - rear-end State Route 05IX10279 0.12 5/7/2011 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 05IX10279 0.12 5/7/2011 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 05IX10279 0.12 5/7/2011 11:30 No Injury 0 0 0 2 0 0 Intersection Related but Not at Intersection From same direction - both going straight - one stopped - rear-end State Route 05IX10279 0.16 7/7/2011 14:52 No Injury 0 0 0 2 0 0 Intersection Related but Not at Intersection From same direction - both going straight - one stopped - rear-end State Route 05IX10279 0.16 7/7/2011 14:52 No Injury 0 0 0 2 0 0 Intersection Related but Not at Intersection From same direction - both going straight - one stopped - rear-end State Route 05IX10279 0.16 7/7/2011 14:52 No Injury 0 0 0 2 0 0 Intersection Related but Not at Intersection From same direction - both going straight - one stopped - rear-end												0	0		
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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 - 1-5 NB Ramps / Trosper Rd State Route			5.52												
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 - 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 - one stopped - rear-end	,		r Dd	1-00	1	5, 25, 2014	11.33				_		U	p	produce an extract one less tall one straight
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 - 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						40/20/20/-	.=	No. 1 1	_		_		•	harana dan Balara dharan a a a a a	Ir design the back as to a second the second to the s
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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															
	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

	PRIMARY	MILE	BLOCK			MOST SEVERE				#PED	#PED		
JURISDICTION	TRAFFICWAY	POST	NUMBER	INTERSECTING TRAFFICWAY	DATE	TIME INJURY TYPE	# INJ	#FAT	#VEH	S	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
	005LX10279	0.19						0		0			
State Route	005LX10279	0.19			11/1/2014 8/13/2010		0	0	2	0	0	At Intersection and Related	Entering at angle
State Route					4/14/2013		2			_	0	At Intersection and Not Related	From same direction - both going straight - both moving - rear-end
State Route	005LX10279	0.19				15:29 Possible Injury		0	2	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	-	_	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
33 - Capitol B	lvd / Trosper	Rd											
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
	TROSPER RD SW			CAPITOL BLVD SW	7/7/2014			0	3	0	0		
City Street						7:43 Possible Injury	2			_	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	TROSPER RD SW		F200	CAPITOL BLVD SW	7/20/2010	11:11 No Injury	0	0	2	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			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			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	V	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	V	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	V	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	V	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			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	V	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		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		12/12/2010	14:15 No Injury	0	0	2	0	_	At Driveway	Entering at angle
	10.11 110 2 0 2 4 0 3 11	•	1000		12/12/2010	17.13 NO INJULY					U		Entering at dilgie

PROCESSOR March		1						ı		1	ı —			T	1
Control Cont												#PED	#PED		
Control Cont	JURISDICTION	TRAFFICWAY	POST	NUMBER	INTERSECTING TRAFFICWAY	DATE	TIME	INJURY TYPE	# INJ	#FAT	#VEH	S	AL	JUNCTION RELATIONSHIP	FIRST COLLISION TYPE / OBJECT STRUCK
Golden	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
Column C	City Street	CAPITOL BLVD SV	V	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
Companies Confront No. 19	City Street	CAPITOL BLVD SV	V	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
Company Comp	City Street	CAPITOL BLVD SV	V	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
Company Comp	City Street	CAPITOL BLVD SV	V	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
Company Comp		CAPITOL BLVD SV	V	5400	LEE ST SE		10:36	Possible Injury	1	0	2	0	0	At Intersection and Related	
Control Cont		CAPITOL BLVD SV	V	5400	LEE ST SE		15:16			0	2	0	0	At Intersection and Not Related	
Control Cont	City Street	CAPITOL BLVD SV	V	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
Companies		CAPITOL BLVD SV	V		LEE ST SE				1	0	2	0	0	At Intersection and Related	
Conference	City Street	CAPITOL BLVD SV	V	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
Conference		CAPITOL BLVD SV	V	5400						0	2	0	0	At Intersection and Related	
Confusional Confus															
City Street															
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Company Comp												_			
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Comparison CAPTICE, REVO SW 5000 EST STW 1087/3072 13-55 No Injury 0 0 2 0 0 A Intersection and Related From same direction - both gaining straight - one stopped - rear-end CRI STREET CAPTICE, REVO SW 5000 EST STW 977/2014 15-55 Evident Injury 1 0 2 1 0 A Intersection and Related From Same direction - both gaining straight - one stopped - rear-end CRI STREET CAPTICE, REVO SW 5000 EST STW 977/2014 15-55 Evident Injury 1 0 2 0 0 A Intersection and Related From Same direction - both gaining straight - one stopped - rear-end CRI STREET CRI								_ , ,			_		0		
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Cry Street CAPTIOL BLVD SW S400 LET ST SW 6/14/2011 8.52 (No Injury 0 0 2 0 0 0 1 1 0 At Intersection and Related From same direction - both going straight - one stopped - rear end Cry Street CAPTIOL BLVD SW S400 LET ST SW 8/18/2010 1.55 (No Injury 0 0 0 2 0 0 At Intersection and Related From Same direction - both going straight - one stopped - rear end Cry Street CAPTIOL BLVD SW S500 LET ST SW 8/18/2010 1.55 (No Injury 0 0 0 2 0 0 At Intersection and Not Related From Same direction - both going straight - one stopped - rear end Cry Street CAPTIOL BLVD SW S500 LET ST SW 8/18/2010 1.75 (No Injury 0 0 0 2 0 0 No Intersection and Not Related From Same direction - both going straight - both moring - rear end Cry Street CAPTIOL BLVD SW S500 LET ST SW 8/18/2010 1.75 (No Injury 0 0 0 2 0 0 No Intersection Related but Not at Intersection - both going straight - both moring - rear end Cry Street LET ST SW S309/2010 1.05 (No Injury 0 0 2 0 0 No Intersection Related but Not at Intersection - both going straight - both moring - rear end Cry Street LET ST SW S309/2010 1.05 (No Injury 0 0 2 0 0 No Intersection and Related but Not at Intersection - both going straight - both moring - rear end Cry Street LET ST SW S309/2010 1.05 (No Injury 0 0 2 0 0 No Intersection and Related Vivide turning left this predestrain - both going straight - both moring - rear end Cry Street LET ST SW S300 CAPTIOL BLVD SW S7/2013 19.18 (No Injury 0 0 2 0 0 No Intersection and Related Vivide turning left this predestrain - cry Street LET ST SW S300 CAPTIOL BLVD SW S7/2013 11.51 (No Injury 0 0 0 2 0 0 No Intersection and Related Vivide turning left this predestrain - cry Street LET ST SW S300 CAPTIOL BLVD SW S7/2013 11.51 (No Injury 0 0 0 2 0 0 No Intersection and Related													-		
Cry Street CAPTIOL BLUD SW 5600 LEST SW 121/5/2014 11.57 No Injury 0 0 1 0 0 0 1 0 0 0												_	-		
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City Street LEE ST SE			V	5600	0.10 mg/ 0.11 m 0.5								-		
City Street LEE ST SE				400									-		
City Street LESTSE 100 7,16/2013 17-27/No Injury 0 0 2 0 0 At Driveway Entering at angle					CAPITOL BLVD SW										
City Street LEE ST SK 100 CAPITOL BLVD SW 87/72013 11:45 No Injury 0 0 0 2 0 0 At Driveway Entering at angle															
EE ST SW 200 CAPTICO 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 200 9/20/2010 16:37 No Injury 0 0 2 0 0 At Driveway Entering at angle 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 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 2/20/2013 15:37 No Injury 0 0 2 0 0 At Driveway From same direction - one left turn - one straight City Street LEE ST SW 200 8/26/2013 12:23 No Injury 0 0 2 0 0 At Driveway From same direction - one left turn - one straight City Street LEE ST SW 200 8/26/2013 12:23 No Injury 0 0 2 0 0 At Driveway From opposite direction - one left turn - one straight City Street LEE ST SW 200 8/26/2013 12:23 No Injury 0 0 2 0 0 At Driveway From same direction - one left turn - one straight City Street LEE ST SW 200 8/26/2013 12:23 No Injury 0 0 2 0 0 At Driveway City Street LITTLEROCK RD SW 5/10/2014 11:19 No Injury 0 0 2 0 0 At Driveway Utility Pole Utility Pole City Street LITTLEROCK RD SW 5/10/2014 5/20/2014														·	
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City Street LEE ST SW 200 8/26/2013 12:23 No Injury 0 0 0 2 0 0 At Driveway Entering at angle													_	,	11
City Street LEESTSW 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 12/2/2014 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 DR 11/10/2014 15:45 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 DRWY 11/14/2012 22:00 Evident Injury 1 0 1 1 0 At Intersection and Related From same direction - both going straight - one stopped - rear-end City Street LITTLEROCK RD SW 5700 COSTCO DRWY 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 5700 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 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 12/31/2014 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 12/31/2014 7:28 No Injury 0 0 2 0 0 Circulating Roundabout From same direction - both going straight - both moving - rear-end											2			,	
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		•				8/17/2012	12:19	No Injury	0	0	1	0	0	At Driveway	Utility Pole
City Street LITTLEROCK RD SW S400 FRED MEYER COSTCO ENTRAN S/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	35 - Littlerock	k Rd at Fred M	leyer / 0	Costco Dr	'wy										
36 - Littlerock Rd / Costco Drwy City Street LITTLEROCK RD SW 5400 COSTCO 10/25/2014 11:19 No Injury 0 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 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 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 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 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 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 12/3/2014 17:28 No Injury 0 0 2 0 0 Entering Roundabout From same direction - both going straight - both moving - rear-end City Street LITTLEROCK RD SW 6300 KINGSWOOD DR SW 11/14/2011 16:04 No Injury 0 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 11/14/2011 13:37 Evident Injury 1 0 1 0 0 Circulating Roundabout Street Light Pole or Base City Street LITTLEROCK RD SW 6300 KINGSWOOD DR SW 11/14/2011 12:43 Possible Injury 1 0 0 0 0 Entering Roundabout From same direction - both going straight - both moving - rear-end Ci	City Street										1	1	0	At Intersection and Related	Vehicle turning left hits pedestrian
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City Street LITTLEROCK RD SW 5400 COSTCO 10/25/2014 11:19 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 DR 11/10/2014 15:45 No Injury 1 0 1 1 0 At Intersection and Related From same direction - both going straight - one stopped - rear-end Vehicle going straight hits pedestrian Street LiTTLEROCK RD SW 5700 KINGSWOOD DR SW 5/14/2012 14:24 No Injury 0 0 1 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 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 12/31/2014 17:23 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 12/31/2014 17:23 Possible Injury 1 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 11/14/2011 16:04 No Injury 0 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 0 0 Circulating Roundabout From same direction - both going straight - both moving - rear-end City Street LITTLEROCK RD SW 6300 KINGSWOOD DR SW 7/7/2010 12:20 No Injury 0 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 7/7/2010 12:20 No Injury 1 0 0 2 0 0 Entering Roundabout From same direction - both going straight - both moving - rear-end City	36 - Littlerock	k Rd / Costco I	Drwv												
City Street LITTLEROCK RD SW 5700 COSTCO DR 11/10/2014 15:45 No Injury 0 0 0 2 0 0 At Intersection and Related From same direction - both going straight - one stopped - rear-end Vehicle going straight its pedestrian Vehicl				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 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 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 5900 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 Exiting Roundabout From same direction - both going straight - both moving - rear-end 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 0 0 Circulating 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 0 0 Circulating Roundabout From same direction - both going straight - both moving - rear-end City Street LITTLEROCK RD SW 6300 KINGSWOOD DR SW 7/7/2010 12:20 No Injury 0 0 0 2 0 0 Extering Roundabout From same direction - both going straight - both moving - rear-end City Street LITTLEROCK RD SW 5900 KINGSWOOD DR SW 7/7/2010 12:20 No Injury 0 0 0 2 0 0 Entering Roundabout From same direction - both going straight - both moving - rear-end													-		
37 - Littlerock Rd / Kingswood Dr City Street LITTLEROCK RD SW 6300 KINGSWOOD DR SW 5/14/2012 14:24 No Injury 0 0 1 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 12/32/2014 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 Exiting 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 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 0 0 Circulating 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 0 0 Circulating Roundabout From same direction - all others City Street LITTLEROCK RD SW 6300 KINGSWOOD DR SW 7/7/2010 12:20 No Injury 0 0 0 2 0 0 At Intersection and Related From same direction - all others City Street LITTLEROCK RD SW 5900 KINGSWOOD DR SW 7/7/2010 12:20 No Injury 0 0 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 7/7/2010 12:20 No Injury 0 0 0 2 0 0 At Intersection and Related From same direction - both going straight - both moving															
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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														Ü	
	City Street	LITTLEROCK RD S	W	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

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	PRIMARY	MILE	BLOCK				MOST SEVERE				#PFD	#PED		
JURISDICTION	TRAFFICWAY	POST	NUMBER	INTERSECTING TRAFFICWAY	DATE	TIME	INJURY TYPE	# INJ	#FAT	#VFH	S	AL	JUNCTION RELATIONSHIP	FIRST COLLISION TYPE / OBJECT STRUCK
City Street	LITTLEROCK RD SW		6000		3/8/2010	13:39		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	- ,- ,-	0	0	2	0	0	Driveway Related but Not at Driveway	From same direction - both going straight - both moving - rear-end
	LITTLEROCK RD SW		5700		7/28/2012	12:05		1	0	1	0	1	At Driveway	Vehicle - Pedalcyclist
	LITTLEROCK RD SW		5700		10/1/2011	13:29		1	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
							,,,,					_		
	LITTLEROCK RD SW	V	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 B	•													
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 /)					3, 22, 2323						_			
				I			I			_	_		T	<u> </u>
	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
40 - Capitol B	Slvd /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
	CAPITOL BLVD S		6600		7/9/2014		No Injury	0	0	2	0	0	At Driveway	Entering at angle
	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
	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		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		2	0	2	0	0	At Intersection and Related	Entering at angle
	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
	CAPITOL BLVD SW		6500	DENNIS ST SW	5/7/2014		Serious Injury	1	0	1	0	0	At Intersection and Not Related	Curb, Raised Traffic Island or Raised Median Curb
,	CAPITOL BLVD SW		6500		5/13/2014	16:05	No Injury	0	0	2	0	0	At Driveway	Entering at angle
11 - Capitol B	livd /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
ity 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
	CAPITOL BLVD S		6700	ISRAEL RD SE	5/25/2010		No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	CAPITOL BLVD S		0,00	ISRAEL RD SE	3/26/2012		Evident Injury	1	0	2	0	0	At Intersection and Related	Entering at angle
	CAPITOL BLVD S		6700	ISRAEL RD SE	6/13/2013		Evident Injury	1	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
	CAPITOL BLVD S		6800	ISRAEL RD SE	10/11/2014			0		2	0		At Intersection and Related	From opposite direction - one left turn - one straight
City Street			6700	ISRAEL RD SE			No Injury	1	0	2		0		
City Street	CAPITOL BLVD S				2/12/2013		Possible Injury	_	0		0	-	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
	CAPITOL BLVD S		6800	ISRAEL RD SE	10/23/2014	13:44	_ , ,	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
	CAPITOL BLVD S		6700	ISRAEL RD SE	3/5/2011	18:18		0	0	2	0	0	At Driveway within Major Intersection	From same direction - one right turn - one straight
	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
	CAPITOL BLVD S		6700	ISRAEL RD SE	7/26/2012		No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
	ISRAEL RD SE			CAPITOL BLVD S	1/30/2014		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	_ , ,	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - both moving - rear-end
	ISRAEL RD SE		n	CAPITOL BLVD S	5/8/2010		No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
ity Street	ISRAEL RD SE		200	CHITOLDEVD 3	6/17/2011		No Injury	0	0	2	0	0	At Driveway	Entering at angle
	ce Belmore Rd			l	0/1//2011	0.31	ivo ilijuly	U	U		U	U	At Direway	Lincollig at angle
		, ootn A		DIACKLAKE DEVICES OF THE	2/2=/22:		No. 1. Com		, ,	_	_	_	Data between the conditions of Data in the	Estado estado de Contra de
,	66TH AVE SW	005	3800	BLACK LAKE BELMORE RD SW	3/27/2014		No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
	BLACK LAKE BELM			66TH AVE SW	12/5/2014		Possible Injury	1	0	2	0	0	At Intersection and Related	Entering at angle
,	BLACK LAKE BELM			66TH AVE SW	11/16/2012		Evident Injury	1	0	1	0	0	At Intersection and Related	Tree or Stump (stationary)
	BLACK LAKE BELM			66TH AVE SW	7/12/2012		No Injury	0	0	2	0	0	At Intersection and Related	From same direction - all others
ity Street	BLACK LAKE BELM	ORE 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
3 - Kirsop Ro	d /66th Ave												<u> </u>	<u> </u>
	66TH AVE SW		3100	KIRSOP RD SW	8/1/2011	17-22	No Injury	0	0	1	0	0	At Intersection and Related	Utility Pole
	KIRSOP RD SW		3100	66TH AVE SW	1/6/2012		Possible Injury	2	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
,				OUTIT AVE 3W										
,	KIRSOP RD SW		6200		7/24/2010		Evident Injury	1	0	1	0	0	At Intersection and Not Related	Tree or Stump (stationary)
	KIRSOP RD SW		6200		5/25/2012	1:13	No Injury	0	0	2	0	0	At Driveway	Entering at angle
4 - Littlerock	k Rd / Odegard	Rd												
ity Street	LITTLEROCK RD SW	V		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
ity Street	LITTLEROCK RD SW	V	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
	LITTLEROCK RD SW		6400		9/11/2014		Possible Injury	1	0	2	0	0	Roundabout Related but not at Roundabout	From same direction - both going straight - both moving - rear-end
	LITTLEROCK RD SW		6500		11/10/2011		No Injury	0	0	2	0		Driveway Related but Not at Driveway	From same direction - both going straight - both moving - rear-end
ary oriect	L ILLNOCK ND 3W	•	5500	l	11/10/2011	14.30	injuit	U	J	-	J	U	oc.ray nelated but 140t at Dilveway	

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	PRIMARY	MILE	BLOCK				MOST SEVERE				#PED			
JURISDICTION	TRAFFICWAY	POST	NUMBER	INTERSECTING TRAFFICWAY	DATE	TIME	INJURY TYPE		#FAT	#VEH	S	Α	L	FIRST COLLISION TYPE / OBJECT STRUCK
•	LITTLEROCK RD S		6600		7/3/2013	15:32	No Injury	0	0	1	0	1	At Driveway	Vehicle - Pedalcyclist
5 - Littlerock	k Rd at Israel F	Rd / 70t	th Ave											
ity 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
ity Street	LITTLEROCK RD S	W	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
ty Street	LITTLEROCK RD S	W		ISRAEL RD SW	10/12/2012	13:32	No Injury	0	0	1	0	0	Exiting Roundabout	Wood Sign Post
ty Street	LITTLEROCK RD S	W		ISRAEL RD SW	6/19/2013	17:57	No Injury	0	0	2	0	0	Entering Roundabout	Entering at angle
ty Street	LITTLEROCK RD S	W		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
ty Street	LITTLEROCK RD S	W	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
ty Street	LITTLEROCK RD S	W	1200		12/21/2014	20:45	Unknown	0	0	1	0	0	Circulating Roundabout	Wood Sign Post
ty Street	LITTLEROCK RD S	W		70TH AVE SW	10/15/2014	19:11	No Injury	0	0	2	0	0	Entering Roundabout	Entering at angle
	LITTLEROCK RD S		6900	70TH AVE SW	12/13/2014		Possible Injury	1	0	1	0	0		Over Embankment - No Guardrail Present
	LITTLEROCK RD S			70TH AVE SW	10/7/2014		No Injury	0	0	2	0	0		Same direction both turning left both moving sideswipe
y Street	70TH AVE SW			LITTLEROCK RD SW	6/28/2010		No Injury	0	0	2	0	0	ŭ	Entering at angle
	70TH AVE SW			LITTLEROCK RD SW	4/5/2010		No Injury	0	0	1	0	0	Ü	Retaining Wall (concrete, rock, brick, etc.)
	n Way / Israel	l D4	1		., 0, 2020									
		. Nu	000	LINDEDCON WAY CW	10/2/2012	7.40	No laine		0	2	0	0	At Interception and Deleted	From some discretion, both point straight, and stay of some of
y Street	ISRAEL RD SW	<u> </u>	900	LINDERSON WAY SW	10/2/2013		No Injury	0	0	2	0	_		From same direction - both going straight - one stopped - rear-end
y Street	ISRAEL RD SW	 	900	LINDERSON WAY SW	10/23/2013		No Injury	0	0	2	0	0		Entering at angle
y Street	ISRAEL RD SW	!	900	LINDERSON WAY SW	10/31/2012		No Injury	0	0	2	0	0		From opposite direction - one left turn - one straight
y Street	ISRAEL RD SW	!		LINDERSON WAY SW	11/18/2011		Possible Injury	1	0	2	0	0		From opposite direction - one left turn - one straight
y Street	ISRAEL RD SW		900	LINDERSON WAY SW	12/10/2010		Possible Injury	1	0	2	0	0		From same direction - both going straight - both moving - rear-end
y Street	LINDERSON WAY		6900		5/6/2014		No Injury	0	0	2	0	0		Entering at angle
y 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
' - Littlerock	k Rd /Tumwat	ter Blvd												
y Street	LITTLEROCK RD S	W	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
/ Street	LITTLEROCK RD S	W		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
Street	LITTLEROCK RD S	W	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
Street	LITTLEROCK RD S	W	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
Street	LITTLEROCK RD S	W	7200	TUMWATER BLVD SW	8/7/2014		No Injury	0	0	2	0	0		Same direction both turning left both moving sideswipe
	LITTLEROCK RD S			TUMWATER BLVD SW	3/2/2011		No Injury	0	0	2	0	0		From same direction - both going straight - both moving - sideswipe
y Street	LITTLEROCK RD S			TUMWATER BLVD SW	3/26/2013		No Injury	0	0	1	0	0	_	Concrete Barrier/Jersey Barrier - Face
	LITTLEROCK RD S			TUMWATER BLVD SW	3/26/2010		Possible Injury	1	0	2	0	0	ŭ	From same direction - both going straight - one stopped - rear-end
y Street	LITTLEROCK RD S			TUMWATER BLVD SW	12/15/2010	17:22	No Injury	0	0	2	0	0		From same direction - one left turn - one straight
y Street	LITTLEROCK RD S			TUMWATER BLVD SW	5/19/2010		No Injury	0	0	2	0	0		From same direction - both going straight - both moving - sideswipe
y Street	LITTLEROCK RD S		5100	TUMWATER BLVD SW	2/27/2014		No Injury	0	0	2	0	0	ŭ	Curb, Raised Traffic Island or Raised Median Curb
	LITTLEROCK RD S		3100	TUMWATER BLVD SW	5/25/2013		No Injury	0	0	1	0	0		Metal Sign Post
y Street	LITTLEROCK RD S		100	TOWWATER BEVD 3W	8/7/2013		No Injury	0	0	2	0	0	8	Wood Sign Post
/ Street	LITTLEROCK RD S		100				No Injury	0	0	2	0	0	9	
	LITTLEROCK RD S		7100		1/10/2011 12/6/2014		No Injury	0	0	1	0	0	Ü	From same direction - both going straight - both moving - rear-end Curb, Raised Traffic Island or Raised Median Curb
Street	LITTLEROCK RD S		7100		10/27/2012			0	0	2	0	0		
Street				LITTI EDOCK DD CM			No Injury					_		From same direction - both going straight - both moving - sideswipe
Street	TUMWATER BLVI		5500	LITTLEROCK RD SW	1/29/2010		No Injury	0	0	1	0	0	. 0	Metal Sign Post
Street	TUMWATER BLVI		5500	LITTLEROCK RD SW	9/13/2014		Evident Injury	1	0	2	0	0	ü	Vehicle overturned
Street	TUMWATER BLVI			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
	mps /Tumwat	ter Blvd	1											
	005R110162	0.36	-		11/20/2014		No Injury	0	0	2	0	0		From same direction - both going straight - one stopped - rear-end
te 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
te Route	005LX10130	0.00	ו		10/23/2014	19:01	Possible Injury	1	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
te Route	005LX10130	0.00			12/7/2012		No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
te 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
e Route	005LX10130	0.00)		1/24/2014		No Injury	0	0	3	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
	005LX10130	0.00	ו		2/22/2014		No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
e Route	005LX10130	0.00	ס		3/3/2014	10:00	No Injury	0	0	2	0	0	At Intersection and Related	Same direction both turning left both moving sideswipe
te Route	005LX10130	0.00)		1/25/2012	17:06	Possible Injury	1	0	2	0	0		From same direction - both going straight - one stopped - rear-end
te Route	005LX10130	0.00			3/5/2014		No Injury	0	0	2	0	0		Entering at angle
te Route	005LX10130	0.00			12/4/2012		No Injury	0	0	2	0	0		From opposite direction - one left turn - one straight
te Route	005LX10130	0.00			11/3/2012		No Injury	0	0	2	0	0		Entering at angle
te Route	005LX10130	0.00			10/20/2011		No Injury	0	0	2	0	0		From same direction - all others
ite Route	005LX10130	0.00			5/15/2014		No Injury	0	0	2	0	0		Same direction both turning left both moving sideswipe
	005LX10130	0.00			7/24/2014		No Injury	0	0	2	0	-	At Intersection and Related At Intersection and Related	From same direction both turning iert both moving sideswipe From same direction - both going straight - one stopped - rear-end
					//24/2014	10:26	ivo injury	U	U		U	1 0	At intersection and herated	rrom same un ection - both going straight - one stopped - rear-end
	mps /Tumwa						1							
te Route	005LX10130	0.16	5		6/15/2012	14:18	Possible Injury	1	0	2	0	0	At Intersection and Related	Entering at angle

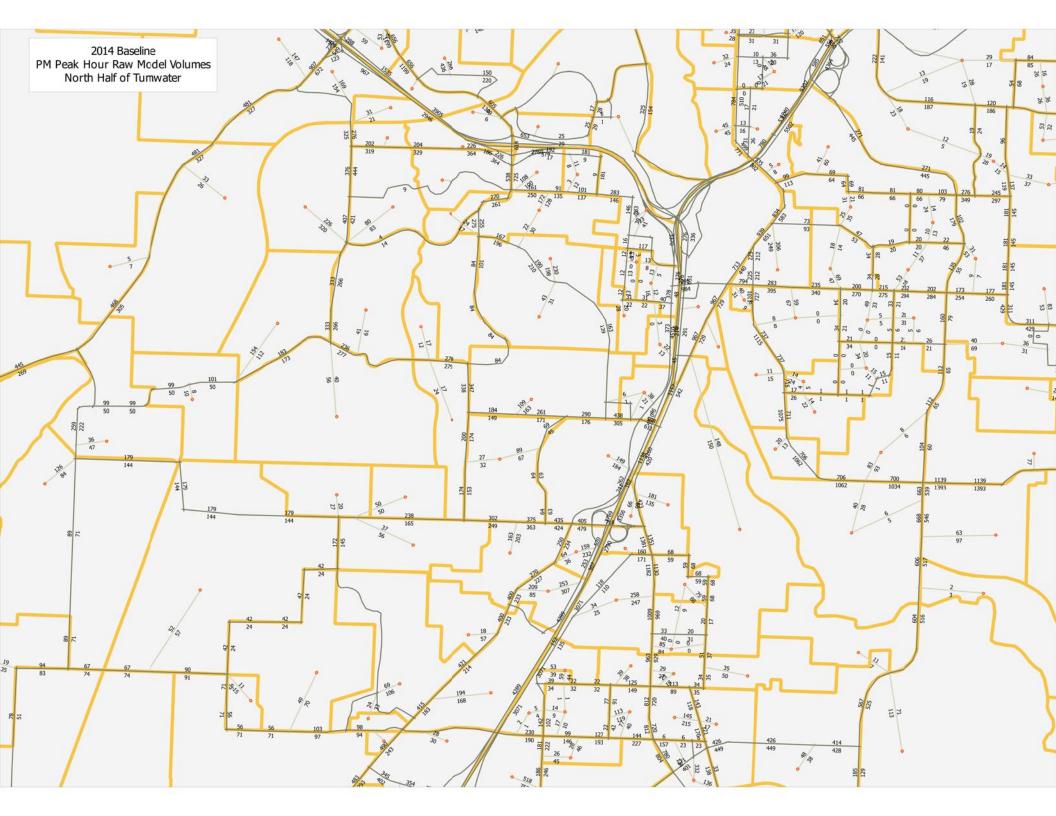
	PRIMARY	MILE	BLOCK				MOST SEVERE				#PED	#PED			
JURISDICTION	TRAFFICWAY	POST	NUMBER	INTERSECTING TRAFFICWAY	DATE	TIME	INJURY TYPE			#VEH	S	AL	JUNCTION RELATIONSHIP	FIRST COLLISION TYPE / OBJECT STRUCK	
	005LX10130 005LX10130	0.16	1		1/7/2013 5/10/2011		No Injury No Injury	0	0	2	0	0	At Intersection and Related At Intersection and Related	Guardrail - Face From opposite direction - one left turn - one straight	
	005LX10130	0.16			3/1/2014	9:44	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle	
	005LX10130	0.16			2/5/2014		No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight	
	005LX10130	0.16			11/27/2014	17:12		1	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight	
	005LX10130	0.16			10/25/2010		No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle	
	005LX10130	0.16			7/21/2014		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	i		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	
	005P110093	0.39			12/7/2010		No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end	
	005P110093	0.39			3/3/2013		No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end	
-	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	
	n Way /Tumw	ater Bl													
	CENTER ST SW		7500	TUMWATER BLVD SW	1/24/2014		No Injury	0	0	1	0	0	At Intersection and Related	Curb, Raised Traffic Island or Raised Median Curb	
City Street	TUMWATER BLV			CENTER ST SW	9/26/2014		No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end	
City Street	TUMWATER BLV			CENTER ST SW	4/26/2012		Possible Injury	1	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight	
City Street	TUMWATER BLV			CENTER ST SW	1/27/2014		No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle	
City Street	TUMWATER BLV			CENTER ST SW	3/15/2013		Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end	
City Street	TUMWATER BLVI		7400	CENTER ST SW	12/12/2013		No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight	
City Street	LINDERSON WAY LINDERSON WAY		7400 7400	TUMWATER BLVD SW TUMWATER BLVD SW	12/6/2013		Possible Injury	1	0	2	0	0	At Intersection and Related At Intersection and Related	Same direction both turning right one stopped rear end	
City Street City Street	TUMWATER BLV		7400	LINDERSON WAY SW	3/5/2014 1/21/2010	10:55	No Injury Possible Injury	0	0	2	0	0	At Intersection and Related At Intersection and Related	Entering at angle	
City Street	TUMWATER BLV		1000	LINDERSON WAY SW	12/10/2014		No Injury	0	0	2	0	0	At Intersection and Related At Intersection and Related	From same direction - both going straight - both moving - rear-end From opposite direction - one left turn - one straight	
City Street	TUMWATER BLV		1000	LINDERSON WAY SW	10/26/2012	15:45		1	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end	
City Street	TUMWATER BLV			LINDERSON WAY SW	7/12/2012	14:42		1	0	2	0	0	At Intersection and Related	Entering at angle	
City Street	TUMWATER BLV			LINDERSON WAY SW	2/17/2011		No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end	
City Street	TUMWATER BLV	SW		LINDERSON WAY SW	3/19/2013		No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight	
City Street	TUMWATER BLV	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 Mar	rket St / Tumv	vater Bl	lvd												
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	
	TUMWATER BLV		200	NEW MARKET ST SW	10/1/2010		No Injury	0	0	2	0	0	Entering Roundabout	From same direction - one right turn - one straight	
City Street	TUMWATER BLV	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 BLV	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 BLV) 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 BLV			NEW MARKET ST SW	12/30/2012		No Injury	0	0	1	0	0	Entering Roundabout	Curb, Raised Traffic Island or Raised Median Curb	
City Street	TUMWATER BLV			NEW MARKET ST SW	6/5/2012		No Injury	0	0	2	0	0	Exiting Roundabout	From same direction - both going straight - both moving - sideswipe	
	TUMWATER BLV				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	
	lvd / Tumwate	er Blvd													
	CAPITOL BLVD S			TUMWATER BLVD SE	9/3/2013		No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end	
	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		<u> </u>	TUMWATER BLVD SE	1/29/2013	22:01		1	0	2	0	0	At Driveway within Major Intersection	From opposite direction - one left turn - one straight	
	CAPITOL BLVD S		1	TUMWATER BLVD SE	10/20/2014		No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end	
	CAPITOL BLVD S CAPITOL BLVD S		1	TUMWATER BLVD SE TUMWATER BLVD SE	3/11/2014 10/1/2012		No Injury	0	0	3	0	0	At Intersection and Related At Intersection and Related	From opposite direction - one left turn - one right turn	
	CAPITOL BLVD S		1	TUMWATER BLVD SE	5/3/2014		No Injury No Injury	0	0	2	0	0	At Intersection and Related At Intersection and Not Related	From same direction - both going straight - one stopped - rear-end	
City Street City Street	CAPITOL BLVD S		1	TUMWATER BLVD SE	2/15/2010		No Injury	0	0	2	0	0	At Intersection and Not Related At Intersection and Related	From same direction - both going straight - one stopped - rear-end Same direction both turning left both moving sideswipe	
City Street	CAPITOL BLVD S		1	TUMWATER BLVD SW	9/12/2010	13:55		1	0	2	0	0	At Intersection and Related At Intersection and Related	From same direction both turning left both moving sideswipe From same direction - both going straight - one stopped - rear-end	
	CAPITOL BLVD S		1	TUMWATER BLVD SW	5/25/2010		No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end	
	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	
	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	
	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 From same direction - both going straight - one stopped - rear-end	
City Street	CAPITOL BLVD S				2/11/2012		Possible Injury	2	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight	
	CAPITOL BLVD S				2/25/2012		Possible Injury	1	0	1	0	0	At Intersection and Not Related	Metal Sign Post	
City Street	TUMWATER BLV			CAPITOL BLVD S	10/24/2012		Possible Injury	1	0	1	0	0	At Intersection and Not Related	Street Light Pole or Base	
City Street	TUMWATER BLV			CAPITOL BLVD S	1/16/2013		No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end	
	TUMWATER BLV				3/23/2011		No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end	
City Street	TUMWATER BLV		100		8/28/2010		No Injury	0	0	2	0	0	At Driveway	From same direction - both going straight - one stopped - rear-end	
City Street	TUMWATER BLVE		100		2/1/2011		No Injury	0	0	2	0	0	,	From opposite direction - one left turn - one straight	
	TUMWATER BLVD				1/9/2010	17.51	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle	

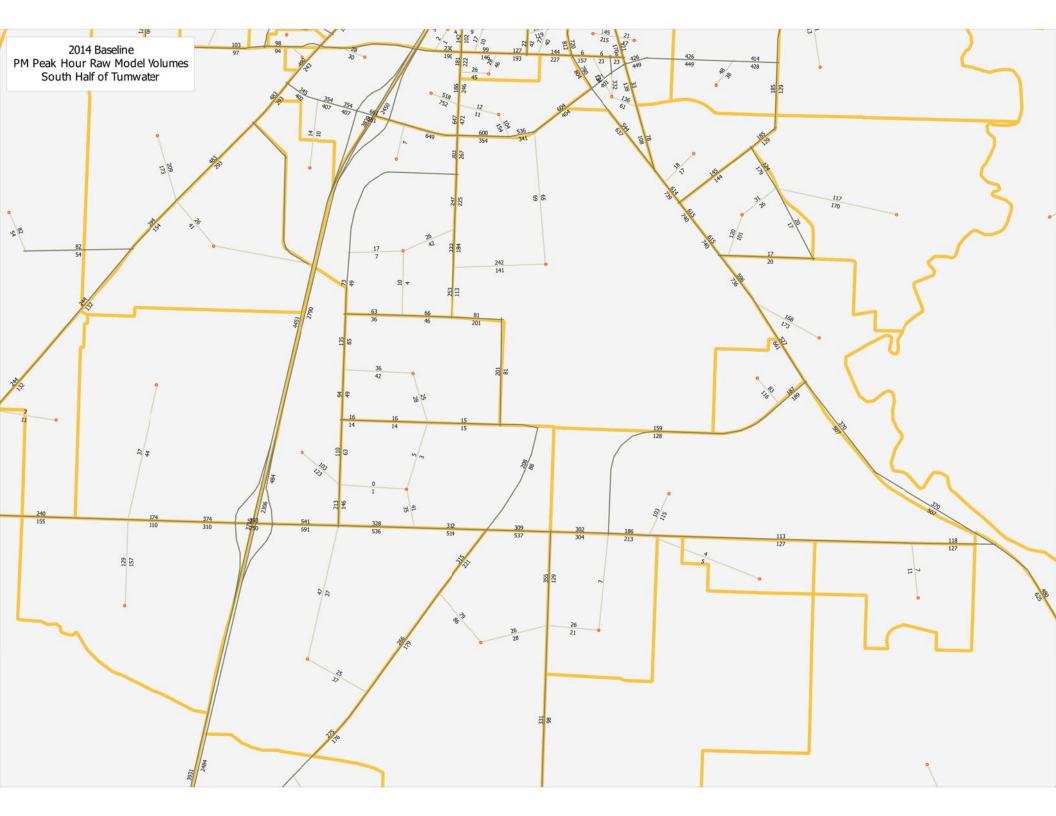
### PROPERTY OF THE STATE OF TH		ı		1	1				1	1			_		
Designation Marketon Market															
Designation Marketon Market															
Designation Marketon Market															
Designation Marketon Market															
		PRIMARY	MILE	BLOCK				MOST SEVERE				#PEC) #1	PED	
	JURISDICTION				INTERSECTING TRAFFICWAY	DATE	TIME		# INJ	#FAT	#VEH				FIRST COLLISION TYPE / OBJECT STRUCK
Control) SW	7200	CAPITOL BLVD S		10:58	No Injury	0					At Intersection and Related	
Control Trummark REVO W COMPS, 800 29/2032 32/205 10/2													_		
Control TUMANTE NEW CONTROL NEW S. 19/2/2013 5.00 Control New York Control	_			100								_	_		
Company Comp				-									_		
Carrier TAMANTER RUCK Section TAMANTER RUCK													_		0 0
33 - 65 May Memberson Blvd												_	_		
County Food 1712 1.28 1.280 1.290	City Street	TUMWATER BLVI) SW		CAPITOL BLVD S	11/1/2012	7:03	No Injury	0	0	2	0		At Intersection and Not Related	From same direction - both going straight - one stopped - rear-end
Court Mode Court	53 - 65th Ave	/ Henderson	Blvd												
Summaries World February	County Road	12120	1.280)	16620	9/6/2012	16:40	No Injury	0	0	3	0		Intersection Related but Not at Intersection	From same direction - both going straight - one stopped - rear-end
Sect MONESCON NELOS 5000 TUMMATER NELOS 1/36/2000 1/36											3	0	1		
State MERICENDA NEW SE MOS TUMMATER KEV SE 271/2012 21-98 for many 1 0 0 0 1 0 0 0 1 0 0					10020	3/11/2011	0.55	r obstate injury		Ŭ			-	o nemerocetor una relacea	Trom same an ection both going straight one stopped real end
Company Comp															
Company Comp	City Street										2				From same direction - both going straight - one stopped - rear-end
Compression TUMANATER BLADUS E 1100	City Street														
Compression TUMANATER BLUD SE 1100	City Street	TUMWATER BLVI) SE	1100	HENDERSON BLVD SE	8/8/2013	17:16	No Injury	0	0	3	0	I	0 At Intersection and Related	From same direction - both going straight - both moving - rear-end
Composition Turk MATER BUYSE 1100 IntROPESON BLVD SE 77/207/2012 1100 150/207/2012 17/20/20/2012 17/20/2012 17/20/2012 17/20/2012 17/20/2012 17/20/20/2012 17/2	City Street	TUMWATER BLVI) SE	1100	HENDERSON BLVD SE	6/23/2012	13:45	Possible Injury	1	0	2	0		0 At Intersection and Related	
Section Fine													_		
Company Front Michol Scope Michol Scope Micro Micr						, -,10		1. /					•		1 5 11 01
Section Company Comp						10/0-1			-	-	-	-	_	a lua:	le non transfer de la companya della companya della companya de la companya della
Fig. 10 Fig.						10/25/2012	7:24	Possible Injury	2	0	2	0		U At Driveway	From same direction - both going straight - one stopped - rear-end
Street Col. December 99 Feederson BivD Street Col. December 99 Feederson BivD Street Col. December 99	56 - Littlerock	k Rd / Black Hi	ills Scho	ool Drwy											
Street Col. December 99 Feederson BivD Street Col. December 99 Feederson BivD Street Col. December 99	City Street	LITTLEROCK RD S	W	7741	THS	1/8/2014	12:45	No Injury	0	0	1	0	Т	0 At Intersection and Related	Signal Pole
Chy Street OLD HIGHWAY 99 SE 7600 HENDESON BLVDS 5/15/2014 11:59 possible injuny 2 0 2 0 0 At Intersection and Related From same direction - both poing straight - one stopped-rear-end Chy Street OLD HIGHWAY 99 SE 7600 HENDESON BLVDS 7/11/2013 11:19 No injuny 0 0 2 0 0 At Intersection and Related From opposite direction - one left turn - one straight Chy Street OLD HIGHWAY 99 SE 7600 HENDESON BLVDS 7/12/2013 11:19 No injuny 0 0 2 0 0 At Intersection and Related From opposite direction - one left turn - one straight Chy Street OLD HIGHWAY 99 SE 7600 HENDESON BLVDS 7/26/2010 12:29 possible injuny 1 0 2 0 0 At Intersection and Related From opposite direction - one left turn - one influence -						, -,		1. /					•		1 × .
Construct Construct Construction Constructi					r										
City Street OLD HIGHWAY 99 SE 7600 HINDRESON BLVD SE 77,107313 11.15 No Injury 0 0 0 2 0 0 At Intersection and Related From opposite direction—one left turn—one straight City Street OLD HIGHWAY 99 SE 7600 HINDRESON BLVD SE 17,127310 12.24 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 7700 HINDRESON BLVD SE 127,12701 16.54 No Injury 0 0 2 0 0 At Intersection and Related From same direction—one bit quite straight one stopped-rear-end City Street OLD HIGHWAY 99 SE 7700 HINDRESON BLVD SE 97,07031 16.44 No Injury 0 0 0 3 0 0 0 At Intersection and Related From same direction—one bit quite straight—one stopped-rear-end City Street OLD HIGHWAY 99 SE 7700 HINDRESON BLVD SE 97,07031 16.44 No Injury 0 0 0 1 0 0 0 At Intersection and Related From same direction—one bit gains straight—one stopped-rear-end City Street OLD HIGHWAY 99 SE 7700 HINDRESON BLVD SE 17,15/2013 222.22 No Injury 0 0 0 At Intersection and Related From same direction—one bits gains straight—one stopped-rear-end City Street OLD HIGHWAY 99 SE 7700 HINDRESON BLVD SE 17,15/2013 222.22 No Injury 0 0 0 At Intersection and Related From same direction—one bits gains straight—one stopped-rear-end City Street OLD HIGHWAY 99 SE 7700 HINDRESON BLVD SE 17,15/2013 222.22 No Injury 0 0 0 At Intersection and Related From same direction—both gains straight—one stopped-rear-end City Street OLD HIGHWAY 99 SE 7700 HINDRESON BLVD SE 27,127/2010 8.44 No Injury 0 0 2 0 0 At Intersection and Related From same direction—both gains straight—one stopped-rear-end City Street OLD HIGHWAY 99 SE 7700 HINDRESON BLVD SE 27,127/2010 8.44 No Injury 0 0 0 0 0 0 At Intersection and Related From same direction—both gains straight—one stopped-rear-e													_		
Cry Street OLD HIGHWAY 99 St 7500 HENDERSON BLVD St 7172/7010 19-24 Possible Injuny 1 0 0 2 0 0 A Intersection and Related From agree direction - both gaing straight - one stopped - rear-end Cry Street OLD HIGHWAY 99 St 700 HENDERSON BLVD St 2171/2014 16-30 No Injuny 0 0 0 0 2 0 0 A Intersection and Related From same direction - both gaing straight - one stopped - rear-end Cry Street OLD HIGHWAY 99 St 700 HENDERSON BLVD St 972/2013 16-44 No Injuny 0 0 0 2 0 0 A Intersection and Related From same direction - both gaing straight - one stopped - rear-end Cry Street OLD HIGHWAY 99 St 700 HENDERSON BLVD St 10/13/2013 15-13 No Injuny 0 0 0 2 0 0 A Intersection and Related From same direction - both gaing straight - one stopped - rear-end Cry Street OLD HIGHWAY 99 St 700 HENDERSON BLVD St 11/16/2013 22-22 No Injuny 0 0 0 2 0 0 A Intersection and Related From same direction - both gaing straight - one stopped - rear-end Cry Street OLD HIGHWAY 99 St 700 HENDERSON BLVD St 27/22/2010 27/22/2013 23-22 No Injuny 0 0 0 0 0 0 0 0 0												_	_		
City Street OLD HIGHWAY 99 St 7000 HENDERSON BLVD SE 11/12/4/2012 14:35 Possible Injury 0 0 0 0 0 0 0 0 0	City Street	OLD HIGHWAY 99	9 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 7700 HENDERSON BLVD SE 9720/1911 15-48 ho linylary O O Z O O At Intersection and Related From same direction- both gaing straight- one stopped -rear-end City Street OLD HIGHWAY 99 SE 7700 HENDERSON BLVD SE 9720/1911 15-48 ho linylary O O Z O O At Intersection and Related From same direction- both gaing straight- one stopped -rear-end City Street OLD HIGHWAY 99 SE 7700 HENDERSON BLVD SE 17/18/2013 23-22 ho linylary O O Z O O At Intersection and Related From same direction- both gaing straight- one stopped -rear-end City Street OLD HIGHWAY 99 SE 7700 HENDERSON BLVD SE 7/18/2013 23-22 ho linylary O O Z O O At Intersection and Related From same direction- both gaing straight- one stopped -rear-end City Street OLD HIGHWAY 99 SE 7700 HENDERSON BLVD SE 7/18/2012 92-21 ho linylary O O Z O O At Intersection and Related From same direction- both gaing straight- one stopped -rear-end City Street OLD HIGHWAY 99 SE 7700 HENDERSON BLVD SE 7/18/2013 83-28 ho linylary O O Z O O At Intersection and Related From same direction- both gaing straight- one stopped -rear-end City Street OLD HIGHWAY 99 SE 7700 HENDERSON BLVD SE 5/18/2011 13-22 house 11/12/2010 7-34 ho linylary O O Z O O At Intersection Related From same direction- both gaing straight- one stopped -rear-end City Street OLD HIGHWAY 99 SE 7700 11/12/2010 7-34 ho linylary O O Z O O At Intersection Related but Not at Intersection From same direction- both gaing straight- one stopped -rear-end City Street OLD HIGHWAY 99 SE 7700 770 ho linylary OLD HIGHWAY 99 SE 7700 OLD HIGHWAY 99 SE	City Street	OLD HIGHWAY 99	9 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
Chy Street OLD HIGHWAY 99 SE 7500 HENDESSON BUDS SE 19/18/2013 15:18 No linjury 0 0 0 0 0 0 0 0 0	City Street	OLD HIGHWAY 99	9 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
Chy Street OLD HIGHWAY 99 SE 7500 HENDESSON BUDS SE 19/18/2013 15:18 No linjury 0 0 0 0 0 0 0 0 0	_	OLD HIGHWAY 9	9 SE	7700	HENDERSON BLVD SE	12/1/2014	16:30	No Injury	0	0		0		At Intersection and Related	
Engineer ClD HidHWAY 99 SE 7600 HENDERSON BLVD SE 10/13/2013 22:29 to hipry 0 0 2 0 0 At Intersection and Related From same direction - both poing straight - one stopped - rear-end (Lift Price of Street ClD HidHWAY 99 SE 700 HENDERSON BLVD SE 1/9/2012 9:21 bossible injuny 1 0 2 0 0 At Intersection and Related Utility Pole From Same direction - both going straight - one stopped - rear-end (Lift Price of Street ClD HidHWAY 99 SE 7600 HENDERSON BLVD SE 7/2/2010 8:44 both purry 0 0 2 0 0 At Intersection and Related From Same direction - both going straight - one stopped - rear-end (Lift Street ClD HidHWAY 99 SE 7600 HENDERSON BLVD SE 5/15/2011 13:20 bossible injuny 2 0 2 0 0 At Intersection and Related From Same direction - both going straight - one stopped - rear-end (Lift Street ClD HidHWAY 99 SE 7600 HENDERSON BLVD SE 5/15/2011 13:20 bossible injuny 2 0 2 0 0 At Intersection and Related From Same direction - both going straight - one stopped - rear-end (Lift Street ClD HidHWAY 99 SE 7600 HENDERSON BLVD SE 5/15/2011 13:20 bossible injuny 2 0 2 0 0 At Intersection and Related From Same direction - both going straight - one stopped - rear-end (Lift Street ClD HidHWAY 99 SE 7600 7700 11/12/2010 73:40 both juny 2 0 2 0 0 At Intersection and Related From Same direction - both going straight - both moving - rear-end (Lift Street ClD HidHWAY 99 SE 7600 7700 11/12/2010 73:40 both juny 70 0 2 0 0 At Intersection and Related From Same direction - both going straight - both moving - rear-end (Lift Street ClD HidHWAY 99 SE 7600 7714 AVE SE 3/13/2010 33:15 Not Injuny 0 0 2 0 0 At Intersection and Related From same direction - both going straight - both moving - rear-end (Lift Street SBO AVE SW 800 CENTER ST SW 8/26/2014 17:34 Possible injuny 0 0 2 0 0 At Intersection and Relat													_		
City Street OLD HIGHWAY 99 SE MENDERSON BLVD SE 1/16/2013 22:22 No Injury 0 0 1 0 0 0 At Intersection and Related Utility Pole	_												_		
City Street OLD HIGHWAY 99 \$\(\) P				7000									_		
City Street OLD HIGHWAY 99 SE 7600 HENDESSON BLVD SE 515/2011 13.20 Possible 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 57/7011 14.21 Possible Injury 1 0 2 0 0 At Intersection Related 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 2 0 0 Difference of the process of the proces													_		
City Street OLD HIGHWAY 99 SE 7600 ST/12/101 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 7700 11/12/2010 7:34 No Injury 0 0 0 3 0 0 Intersection Related but Not at Intersection From same direction - both going straight - both moving - rear-end City Street OLD HIGHWAY 99 SE 7700 11/12/2010 7:34 No Injury 0 0 0 2 0 0 Driveway Related but Not at Intersection From same direction - both going straight - both moving - rear-end Street OLD HIGHWAY 99 SE 7700 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 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 storoged - rear-end City Street OLD HIWY 99 SE NEW YOR													_		
City Street OLD HIGHWAY 99 SE NED NEW 97 SE NED NEW 97 SE NED NEW 99					HENDERSON BLVD SE								_		
Street OLD HWY 99 SE HENDERSON BLVD SE 3/8/2010 8:33 Possible Injury 2 0 2 0 0 Oriveway Related but Not at Driveway From same direction - both going straight - both moving - rear-end	City Street	OLD HIGHWAY 99	9 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
Section Sect	City Street	OLD HIGHWAY 99	9 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
Section Sect	City Street	OLD HWY 99 SE			HENDERSON BLVD SE	3/8/2010	8:33	Possible Injury	2	0	2	0		Driveway Related but Not at Driveway	From same direction - both going straight - both moving - rear-end
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 From opposite direction - one left turn - one straight				•	-	,							_		
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 9/16/2011 15:08 No Injury 0 0 2 0 0 At Driveway From same direction - both going straight - one stopped - rear-end From same direction - both going straight - both moving - rear-end From same direction - both going straight - both moving - rear-end From same direction - both going straight - both moving - rear-end From same direction - both going straight - both moving - rear-end From same direction - both going straight - both moving - rear-end From opposite direction - both going straight - both moving - rear-end From opposite direction - both going straight - both moving - rear-end From opposite direction - both going straight - both moving - rear-end From opposite direction - one left turn - one straight From opposite direction - one left turn - one straight From opposite direction - one left turn - one straight From opposite direction - one left turn - one straight From opposite direction - one left turn - one straight From opposite direction - one left turn - one straight From opposite direction - one left turn - one straight From opposite direction - one left turn - one straight From opposite direction - one left turn - one straight From opposite direction - one left turn - one straight From opposite direction - one right turn - one straight From opposite direction - one right turn - one straight From opposite direction - one right turn - one straight From opposite direction - one right turn - one straight From opposite direction - one right turn - one straight From opposite direction - one right turn - one straight From same direction - one right turn - one straight From same direction - one right turn - one straight From same direction - one right turn - one straight From same direction - on				7000	ZOTIL AVE CE	0/17/2000	43.4=	No lation:	_	_	-	-	_	O Tablatanastian and B-1-1-1	Estavina et enale
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					791H AVE SE								_		
60 - Center 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 1300 CENTER ST SW 8/26/2014 17:34 Possible Injury 2 0 2 0 0 At Intersection and Related Entering at angle	City Street	OLD HIGHWAY 99	9 SE	8000		9/16/2011	15:03	No Injury	0	0	2	0	\perp	0 At Driveway	From same direction - both going straight - both moving - rear-end
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 Entering at angle	59 - Kimmie S	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 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		. / 02													
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	City Street						17:34	Possible Injury		0	2	0	\perp		From opposite direction - one left turn - one straight
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	City Street	83RD AVE SW		800	CENTER ST SW	6/5/2014	11:10	No Injury	0	0	2	0	Τ	0 At Intersection and Related	Entering at angle
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		99 / 88th Δva)			- 1									
County Road 13765 19.730 7/3/2010 15:25 No Injury 0 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 0 2 0 0 At Intersection and Related Entering at angle 62 - I-5 SB Ramps / 93rd Ave State Route 051X09928 0.00 1/22/2011 13:39 No Injury 0 0 0 2 0 0 At Intersection and Related Entering at angle State Route 051X09928 0.00 9/18/2010 22:55 No Injury 0 0 2 0 0 At Intersection and Related Entering at angle State Route 051X09928 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 051X09928 0.00 9/18/2010 11:54 No Injury 0 0 2 0 0 At Intersection and Related Entering at angle State Route 051X09928 0.00 9/18/2010 11:54 No Injury 0 0 2 0 0 At Intersection and Related Entering at angle State Route 051X09928 0.00 9/18/2010 11:54 No Injury 0 0 2 0 0 At Intersection and Related Entering at angle State Route 051X09928 0.00 9/18/2010 11:54 No Injury 0 0 2 0 0 At Intersection and Related Entering at angle State Route 051X09928 0.00 9/18/2011 12:15 No Injury 0 0 2 0 0 At Intersection and Related Entering at angle State Route 051X09928 0.00 9/18/2011 12:15 No Injury 0 0 2 0 0 At Intersection and Related Entering at angle State Route 051X09928 0.00 9/12/2011 13:06 No Injury 0 0 2 0 0 At Intersection and Related Entering at angle State Route 051X09928 0.00 9/12/2011 13:06 No Injury 0 0 0 2 0 0 At Intersection and Related Entering at angle State Route 051X09928 0.00 9/12/2011 13:06 No Injury 0 0 0 2 0 0 At Intersection and Related Entering at angle State Route 051X09928 0.00 9/12/2011 13:06 No Injury 0 0 0 2 0 0 At Intersection and Related Entering at angle				1	T	E/20/2042	15.25	No Injun:	^		٦.	0	1	0 At Drivoway	From some direction, one right turn, and statistic
County Road 13765 19.741 3/28/2012 10:35 No Injury 0 0 2 0 0 At Intersection and Related Entering at angle				+	 								_	,	ů ů
State Route 005LX09928 0.00 1/22/2011 13:39 No Injury 0 0 2 0 0 At Intersection and Related Entering at angle				1											
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 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 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 <td></td> <td></td> <td></td> <td></td> <td></td> <td>3/28/2012</td> <td>10:35</td> <td>No Injury</td> <td>0</td> <td>0</td> <td>2</td> <td>0</td> <td></td> <td>U At Intersection and Related</td> <td>Entering at angle</td>						3/28/2012	10:35	No Injury	0	0	2	0		U 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 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 </td <td>62 - I-5 SB Ra</td> <td>mps / 93rd Av</td> <td>re</td> <td></td>	62 - I-5 SB Ra	mps / 93rd Av	re												
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 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 </td <td>State Route</td> <td>005LX09928</td> <td>0,00</td> <td>)</td> <td></td> <td>1/22/2011</td> <td>13:39</td> <td>No Injury</td> <td>0</td> <td>0</td> <td>2</td> <td>0</td> <td>Т</td> <td>0 At Intersection and Related</td> <td>Entering at angle</td>	State Route	005LX09928	0,00)		1/22/2011	13:39	No Injury	0	0	2	0	Т	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 Entering at angle State Route 005LX09928 0.00 7/21/2011 13:06 No Injury 0 0 2 0 0 At Intersection and Related Entering at angle													_		
State Route 0.05LX09928 0.00 4/22/2010 11:54 No Injury 0 0 2 0 0 At Intersection and Related Entering at angle													_		0 0
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					 								_	o ne meer section and nelated	
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 7/21/2011 13:06 No Injury 0 0 2 0 0 At Intersection and Related Same direction both turning right both moving sideswipe													_		
													_		
50-1-0-1-1 0051/00000 0.00	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 0 2 0 0 At Intersection and Related Entering at angle	State Route	005LX09928	0.00)		3/3/2011	6:55	No Injury	0	0	2	0		0 At Intersection and Related	Entering at angle

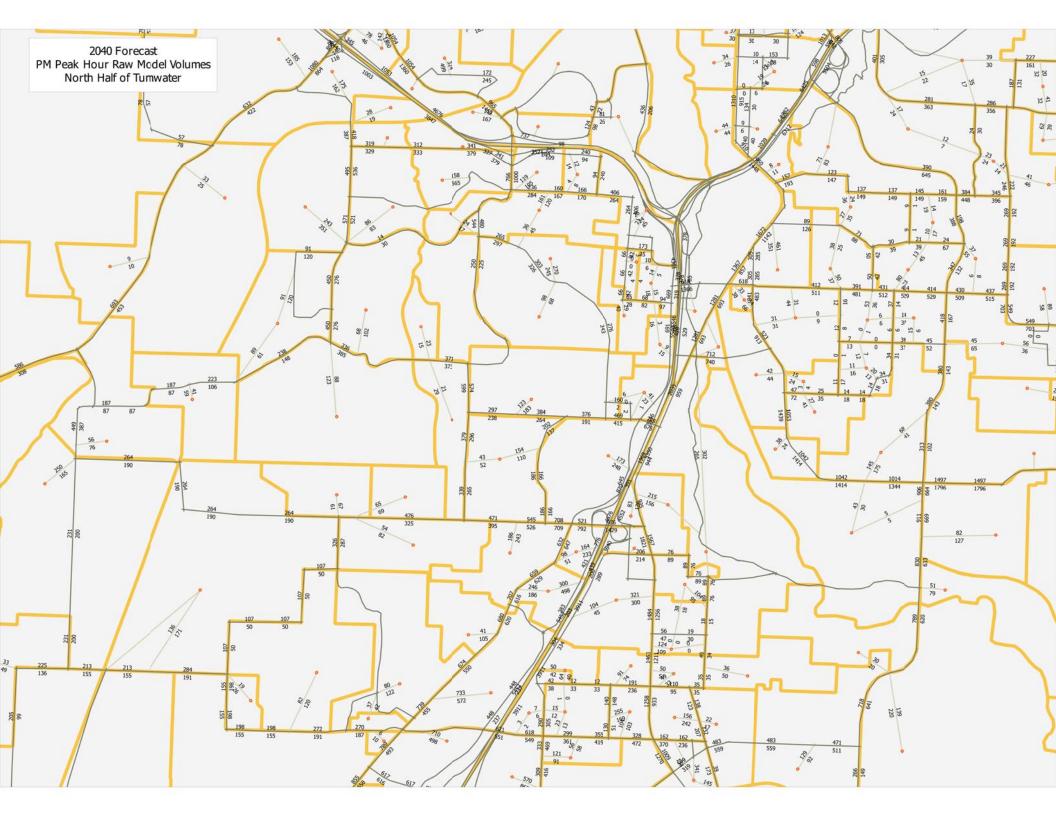
	PRIMARY	MILE	BLOCK				MOST SEVERE				#PED	#PFI		
JURISDICTION	TRAFFICWAY	POST	NUMBER	INTERSECTING TRAFFICWAY	DATE	TIME	INJURY TYPE	# INJ	#FAT	#VEH		AL		FIRST COLLISION TYPE / OBJECT STRUCK
State Route	005LX09928	0.00	HOMBEN	THE TOTAL THE TAXABLE TO THE TAXABLE	7/15/2011		Possible Injury	2	0	2	0	0	At Intersection and Related	Entering at angle
State Route	005LX09928	0.00			9/27/2010		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		No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
State Route	005R109958	0.31			3/7/2011		No Injury	0	0	2	0	0		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		No Injury	0	0	2	0	0		From same direction - one right turn - one straight
State Route	005R109958	0.33			3/30/2010		Possible Injury	1	0	2	0	0		From same direction - both going straight - one stopped - sideswipe
State Route	005R109958	0.33			1/3/2011		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		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		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		No Injury	0	0	2	0	0		From same direction - one left turn - one straight
State Route	005R109958	0.33			4/27/2011		No Injury	0	0	2	0		At Intersection and Related At Intersection and Related	From same direction - one left turn - one straight From same direction - both going straight - one stopped - rear-end
State Route	005R109958	0.33			9/16/2011		No Injury	0	0	2	0	0		From same direction - one right turn - one straight
					3/10/2011	13.13	ivo injury	Ŭ	U			U	At intersection and related	Trom same direction one right turn one straight
	amps / 93rd Av									_			1	<u></u>
State Route	005P109890	0.40			4/17/2012		No Injury	0	0	2	0	0		From same direction - both going straight - one stopped - rear-end
State Route	005P109890	0.40			9/17/2010		Evident Injury	2	0	2	0	0		From same direction - both going straight - one stopped - rear-end
State Route	005Q109977	0.00			11/21/2014		No Injury	0	0	1	0	0	At Intersection and Related	All other non-collision
State Route	005Q109977	0.01			9/22/2014		No Injury	0	0	2	0	0		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 S	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													
	(south) / 93rd													
State Route	121	6.24			5/26/2012		Evident Injury	1	0	1	0	0	At Intersection and Related	Vehicle overturned
State Route	121	6.24			1/22/2010		No Injury	0	0	2	0	0		Entering at angle
State Route	121	6.24			2/11/2011		No Injury	0	0	1	0	0		Fence
State Route	121	6.24			7/5/2011		No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
State Route	121	6.24			12/3/2011		No Injury	0	0	1	0	0	At Intersection and Related	Fence
State Route	121	6.24			7/19/2012		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		No Injury	0	0	2	0	0		From same direction - both going straight - one stopped - rear-end
State Route	121	6.24			9/11/2014		No Injury	0	0	1	0	0		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	l 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
	way 99 / 93rd	Ave			-									
County Road	17010	16.065		13765	8/30/2013	19-22	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		Vehicle overturned
County Road	13765	18.610		17010	12/1/2010		No Injury	0	0	2	0	0		Entering at angle
County Road	13765	18.610		17010	4/12/2013		Evident Injury	1	0	1	0	0		Wood Sign Post
County Modu	13,03	10.010		1,010	7/12/2013	12.43	ucirc irijur y						p it inited section and neighbor	

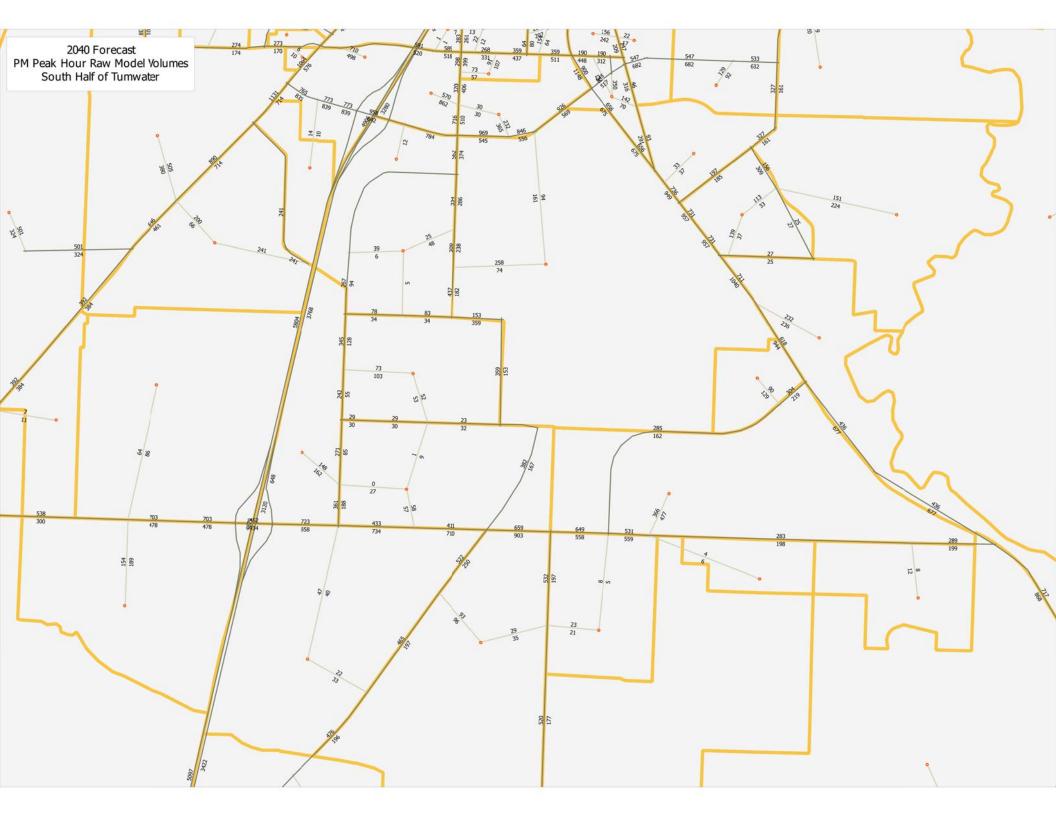
County Road 13765 69 -Center / 76th

APPENDIX A-3TRAVEL DEMAND MODEL PLOTS









APPENDIX A-4TRAFFIC VOLUME CALCULATION WORKSHEETS



							2022 Volumes				2040 Ba	se Model	
			EXISTING	EXISTING	2040 EXISTING	BASE	7 YEAR	BASE	PROJECTED	2040 BASE	BASE	BASE	PROJECTED
Intersection	Move	ement	2015 VOLUMES	MODEL VOLUMES	MODEL VOLUMES	MODEL Δ GROWTH	GROWTH	MODEL ADJUST	2022 VOLUMES	MODEL VOLUMES	MODEL Δ GROWTH	MODEL ADJUST	2040 VOLUMES
		L	43	-	-	-	0	3	46	-	0	12	55
	EB	T	79	-	-	-	0	5	84	-	0	22	101
		R	7			-	0	0	7		0	2	9
1 RW Johnson Blvd SW		L	106 43	158	215	57	15	_	121 46	218	60	42	166 55
RW Johnson Blvd SW Mottman Rd SW	WB	T R	67	44	102	- 58	0 16	3	83	101	0 57	12	124
Wottman Ru SW		L	4	-	-	-	0	0	4	-	0	1	5
TMC Date: 06/30/15	NB	Т	155	232	314	82	22		177	317	85		240
		R	135	212	218	6	2		137	219	7		142
Peak Hour: 4:15 - 5:15		L	45	107	111	4	1		46	110	3		48
PHF: .92	SB	T R	93 18	217	280	63	17 0	1	110 19	277	60 0	5	153 23
		N.	795	970	1,240	270	28%	6%	880	1,242	272	28%	1,121
		L	176	184	203	19	5		181	211	27		203
	EB	T	252	168	157	-11	-3		249	148	-20		232
		R	25	12	20	8	2		27	20	8		33
2 Crosby Blvd SW	WB	L T	4 31	0 21	0 23	0 2	0		4 32	0 21	0		4 31
Mottman Rd SW	WD	R	67	165	225	60	16		83	225	60		127
		L	42	15	23	8	2		44	20	5		47
TMC Date: 10/08/2014	NB	T	348	509	804	295	79		427	825	316		664
		R	166	201	167	-34	-9		157	155	-46		120
Peak Hour: 4:30 - 5:30		L T	120	16	63	47	13		133 688	84 746	68		188 850
PHF: .89	SB	T R	630 425	526 189	740 293	214 104	58 28		688 453	746 299	220 110		850 535
			2,286	2,006	2,718	-07			.55	2,754	-10		
		L	73	299	304	5	1		74	301	2		75
	EB	Т	19	82	112	30	8		27	112	30		49
		R	16	29	54	25	7		23	56	27		43
3 Combined SW	17.00	L	26 36	6	17	11	3		29 38	19	13		39
Crosby Blvd SW Irving St SW	WB	T R	36 166	25 200	34 271	9 71	2 19		38 185	35 256	10 56		46 222
		L	26	14	19	5	1		27	21	7		33
TMC Date: 10/08/2014	NB	Т	290	226	420	194	52		342	443	217		507
		R	14	20	56	36	10		24	32	12		26
Peak Hour: 4:45 - 5:45		L	161	209	201	-8	-2		159	199	-10		151
PHF: .89	SB	T R	424 96	235 94	458 100	223 6	60 2		484 98	470 97	235 3		659 99
		Λ	1,347	1,439	2,046	607	42%	10%	36	2,041	602	42%	,,
		L	5	0	0	0	0	0	5	0	0	2	7
	EB	Т	12	0	0	0	0	1	13	0	0	5	17
		R	165	0	0	0	0	11	176	0	0	69	234
4		L -	1	0	0	0	0	0	1	0	0	0	1
7th Ave SW Irving St	WB	T R	18	0	0	0	0	0	19 1	0	0	8	26 1
irving St		L	173	0	0	0	0	11	184	0	0	72	245
TMC Date: 06/30/15	NB	Т	4	0	0	0	0	0	4	0	0	2	6
		R	1	0	0	0	0	0	1	0	0	0	1
Peak Hour: 4:45 - 5:45		L	0	0	0	0	0	0	0	0	0	0	0
PHF: .92	SB	T	4	0	0	0	0	0	4	0	0	2	6
		R	388	0	0	U	U	10%	413	0	U	42%	550
		L	9	12	12	0	0		9	12	0		9
	EB	T	1	2	2	0	0		1	2	0		1
		R	0	2	2	0	0		0	3	1		1
5		L	10	10	9	-1	0		10 3	11	1		11 3
Crosby Blvd SW Barnes Blvd SW	WB	T R	3 189	4 153	4 246	93	0 25		214	4 249	0 96		285
Survey Divu 344		L	1	2	2	0	0		1	2	0		1
TMC Date: 06/30/15	NB	T	79	90	207	117	32		111	219	129		208
		R	4	9	4	-5	-1		3	4	-5	5	4
Peak Hour: 5:00 - 6:00		L	237	185	282	97	26		263	291	106		343
PHF: .91	SB	T R	112 22	71 19	230 18	159 -1	43 0		155 22	235 18	164 -1		276 21
		حثا	667	559	1,018				792	1,050			1,163
		L	0	-	-	-	0		0	-	0		0
	EB	T	170	183	206	23	6		176	205	22		192
		R	69	86	102	16	4		73	103	17		86
6 Black Lake Belmore Rd SW	WB	L T	130 303	174 293	303 398	129 105	35 28		165 331	292 401	118 108		248 411
Black Lake Blud SW Black Lake Blvd SW	*VD	R	0	- 293	- 250	- 103	0		0	- 401	0		0
		L	178	152	191	39	11		189	185	33		211
TMC Date: 06/30/15	NB	T	0	-	-	-	0		0	-	0		0
		R	105	122	239	117	32		137	248	126		231
Peak Hour: 4:30 - 5:30 PHF: .94	SB	L T	0	-	-	-	0		0	- -	0		0
e11C; 394	JD D	R	0			-	0		0		0		0
			955	1,010	1,439				1,071	1,434			1,379
		L	15	103	41	-62	-17	1	16	46	-57	5	20
	EB	T	21	67	95	28	8		29	97	30		51
		R	1	2	5	3	1		2	6	4		5
7 PW Johnson Blad SW	LLID	L	6 35	21 74	45	24	6		12 44	46	25		31 70
RW Johnson Blvd SW Sapp Rd SW	WB	T R	68	74 141	107 182	33 41	9 11		79	109 182	35 41		109
Supp Nu Sw		L	0	2	6	4	1		1	6	4		4
TMC Date: 06/30/15	NB	T	1	22	48	26	7		8	48	26		27
		R	3	16	34	18	5		8	33	17		20
Peak Hour: 4:45 - 5:45	<u> </u>	L	86	194	235	41	11		97	256	62		148
PHF: .85	SB	T R	3 31	33 106	72 126	39 20	11 5		14 36	71 123	38 17		41 48
		Α	270	781	996	215	28%	6%	346	1,023	242	31%	574



							2022 Volumes				2040 Ba	sse Model	
			EXISTING	EXISTING	2040 EXISTING	BASE	7 YEAR	BASE	PROJECTED	2040 BASE	BASE	BASE	PROJECTED
Intersection	Mov	ement	2015 VOLUMES	MODEL VOLUMES	MODEL VOLUMES	MODEL Δ GROWTH	GROWTH	MODEL ADJUST	2022 VOLUMES	MODEL VOLUMES	MODEL Δ GROWTH	MODEL ADJUST	2040 VOLUMES
		L	0	-	-	-	0		0	-	0		0
	EB	T	0	-	-	-	0		0	-	0		0
8	—	R L	60	71	227	156	0 42		102	234	0 163		0 223
Sapp Rd SW	WB	T	0	-	-	-	0		0	-	0		0
Crosby Blvd SW		R	17	13	13	0	0		17	16	3		20
		L	0	-	-	-	0		0	-	0		0
TMC Date: 06/30/15	NB	T R	129 71	258 89	362 205	104 116	28 31		157 102	358 217	100 128		229 199
Peak Hour: 5:00 - 6:00		L	18	12	8	-4	-1		17	8	-4		14
PHF: .91	SB	T	109	267	348	81	22		131	365	98		207
		R	0	740		-	0		0	- 4 400	0		0
			404 8	710 38	1,163 65	27	7		526 15	1,198 65	27		892 35
	EB	T	12	43	80	37	10		22	82	39		51
		R	13	3	21	18	5		18	17	14		27
9		L	39	0	0	0	0		39	0	0		39
Black Lake Belmore Rd SW 49th Ave SW	WB	T R	14 141	60 119	106 160	46 41	12 11		26 152	105 159	45 40		59 181
45th Ave 3W		L	9	5	29	24	6		15	30	25		34
TMC Date: 06/30/15	NB	T	128	66	166	100	27		155	170	104		232
		R	25	0	0	0	0		25	0	0		25
Peak Hour: 4:15 - 5:15 PHF: .90	SB	L	74 132	101 86	90 249	-11 163	-3 44		71 176	108 213	7 127		81 259
PHF: .90	28	T R	132	86 61	249 115	163 54	44 15		176 25	213 115	127 54		259 64
			605	582	1,081				739	1,064			1,087
		SB Cap	33	196	281	85	23	3	36	281	85	-75	43
	Sunset	NB Cap	13	93	146	53	14	1	14	146	53	-45	21
10	—	Carlyon Sunset	1	33 12	34 21	9	2		3	35 22	10		11
Capitol Blvd SE	Carlyon	SB Cap	56	33	34	1	0		56	35	2	75	133
Carlyon Ave SE/Sunset Way SE		NB Cap	39	28	32	4	1		40	32	4	45	88
**************************************	115	NB Cap	438	462 44	937 54	475	128		566	884	422	54	860 148
TMC Date: 06/25/15	NB	Carlyon Sunset	88 15	145	209	10 64	3 17	1	91 16	50 209	64	-54	25
Peak Hour: 4:30 - 5:30		SB Cap	816	710	1,367	657	177		993	1,356	646	34	1,462
PHF: .85	SB	Sunset	8	92	120	28	8	1	9	120	28	-18	18
		Carlyon	45	32	43	11	3		48	43	11	18	74
		L	1,554 0	1,880	3,278	266	38%	9%	1,874	3,213	0		2,887
	EB	T	0	-	-	-	0		0	-	0		0
		R	0	-	-	-	0		0	-	0		0
11		L	0	-	-	-	0		0	-	0		0
Deschutes Way SW I-5 NB On Ramp	WB	T R	0	-	-	-	0		0	-	0		0
1-3 No On Kamp		L	0	-	-	-	0		0	-	0		0
TMC Date: 07/01/15	NB	T	223	154	227	73	20		243	206	52		275
		R	147	182	159	-23	-6		141	175	-7		140
Peak Hour: 4:30 - 5:30		L T	158	49	63	14	4		162 326	58	9		167 405
PHF: .79	SB	R	303 0	276	362	86	23 0		0	378	102 0		0
			831	661	811				872	817	-		987
		L	0	-	-	-	0		0	-	0		0
	EB	T	0	-	-	-	0		0	-	0		0
12		R L	0	-	-	-	0		0	-	0		0
Deschutes Way SW	WB	T	0	-	-	-	0		0		0		0
US 101 WB On Ramp		R	0	-	-	-	0		0	-	0		0
		L	428	316	391	75	20		448	403	87		515
TMC Date: 07/01/15	NB	T R	385 0	336	386	50	13		398 0	381	45 0		430
Peak Hour: 5:00 - 6:00		R L	0		-	-	0		0	-	0		0
PHF: .92	SB	T	260	276	362	86	23		283	378	102		362
		R	19	0	0	0	0		19	0	0	10	29
			1,092	928	1,139		0		0	1,162	^	50%	1,336 0
	EB	L T	0				0		0		0		0
		R	151	145	218	73	20		171	200	55		206
13		L	0	-	-	-	0		0	-	0		0
I-5 SB/US 101 EB Off Ramps/N 2nd Ave SW	WB	T	0	-	-	-	0		0	-	0		0
Desoto St SW	—	R L	0 172	276	382	106	0 29		0 201	378	0 102		0 274
TMC Date: 06/30/15	NB	T	0	-	-	-	0		0	-	0		0
		R	0		-	-	0		0		0		0
Peak Hour: 4:30 - 5:30		L	0	-	-	-	0		0	-	0		0
PHF: .89	SB	T R	804 43	1151 40	1274 29	123 -11	33 -3		837 40	1280 27	129 -13		933 30
		R	1,170	1,612	1,903		,		#0	1,885	13		30
		L	0			-	0		0		0		0
	EB	T	0	-	-	-	0		0	-	0		0
	<u> </u>	R	0	-		461	0		0	-	0		0
14 N 2nd Ave SW	WB	L T	124 0	28	219	191	51 0		175 0	237	209	-96	237 0
N 2nd Ave SW Custer Way SW	- WD	R	151	267	382	115	31	1	182	378	111	1	262
			0	-	-	-	0		0	-	0		0
		L								0	0		
TMC Date: 02/10/15	NB	Т	23	9	0	-9	-2		21	0	-9		14
TMC Date: 02/10/15	NB	T R	23 149	39	269	230	62		211	319	280	-110	319
TMC Date: 02/10/15 Peak Hour: 4:45 - 5:45		T R L	23 149 814	39 945	269 1,039	230 94	62 25		211 839	319 1,047	280 102	-110	
TMC Date: 02/10/15	NB SB	T R	23 149	39	269	230	62		211	319	280	-110	319 916



							2022 Volumes				2040 Ba	se Model	
I-4			EXISTING 2015	EXISTING MODEL	2040 EXISTING MODEL	BASE MODEL	7 YEAR	BASE MODEL	PROJECTED 2022	2040 BASE MODEL	BASE MODEL	BASE MODEL	PROJECTED 2040
Intersection	IVIOVI	ement	VOLUMES	VOLUMES	VOLUMES	Δ GROWTH	GROWTH	ADJUST	VOLUMES	VOLUMES	Δ GROWTH	ADJUST	VOLUMES
		L	0	-	-	-	0		0	-	0		0
	EB	T	709	917	1,208	291	78		787	1,203	286		995
15		R	167 371	67 368	101 401	34 33	9		176 380	164 234	97 -134		264 237
Boston St SW	WB	T	258	247	530	283	76		334	529	282		540
Custer Way SW		R	3	-	-	-	0		3	-	0		3
		L	0	48	71	23	6	-6	0	85	37	-37	0
TMC Date: 06/25/15	NB	T R	1 150	126	179	53	0		1 164	92	-34	-1	0 116
Peak Hour: 4:30 - 5:30		L	0	-	-	-	0		0	-	0		0
PHF: .95	SB	T	1	-	-	-	0		1	-	0		1
		R	4	-		-	0		4		0		4
		-	1,664	1,773	2,490		0		1,850	2,307	0		2,160 0
	EB	T	0	-	-	-	0		0	-	0		0
		R	0	-	-	-	0		0	-	0		0
16		L	95	64	135	71	19		114	148	84		179
Deschutes Way SW Boston St SW	WB	T R	0 413	371	366	-5	-1		0 412	250	0 -121		0 292
55361151511		L	0	-	-	-	0		0	-	0		0
TMC Date: 07/01/15	NB	T	363	281	410	129	35		398	535	254		617
		R	61	75	121	46	12		73	83	8		69
Peak Hour: 4:30 - 5:30 PHF: .93	SB	L T	102 186	98 178	129 234	31 56	8 15	-	110 201	95 283	-3 105		99 291
FIII53	30	R	0	-	-	-	0		0	-	0		0
			1,220	1,067	1,395	328	31%	7%	1,308	1,394			1,547
		L	0	-	-	-	0		0	-	0		0
	EB	T R	332 18	440 0	916 0	476 0	128		460 18	857 0	417 0		749 18
17		L L	363	225	342	117	32		395	305	80		443
Cleveland Ave SE	WB	т	551	713	1341	628	169		720	1367	654		1,205
Capitol Blvd SE		R	0	-	-		0		0	-	0		0
TMC Date: 06/25/15	NB	L T	0	0	0	0	0		0	0	0		0
TWC Date: 00/25/15	IND	R	224	212	284	72	19		243	285	73		297
Peak Hour: 4:30 - 5:30		L	0	-	-	-	0		0	-	0		0
PHF: .88	SB	T	0	-	-	-	0		0		0		0
		R	0	4.500	2.002	-	0		0	2011	0		0
		-	1,488 137	1,590 116	2,883 270	154	41		1,836 178	2,814 337	221		2,712 358
	EB	T	648	880	1,084	204	55		703	916	36		684
		R	80	47	33	-14	-4		76	42	-5		75
18		L	344	337	534	197	53		397	182	-155		189
Custer Way SE Capitol Blvd SE	WB	T R	440 6	491 7	700 17	209 10	56 3		496 9	469 0	-22 -7	6	418 5
Capitor Biva 3E		L	18	0	0	0	0		18	4	4		22
TMC Date: 02/10/15	NB	T	332	317	629	312	84		416	520	203		535
		R	426	412	624	212	57		483	169	-243		183
Peak Hour: 4:45 - 5:45 PHF: .90	SB	L T	18 392	5 584	22 1088	17 504	5 136		23 528	20 1057	15 473		33 865
Prir: .90	36	R	135	124	231	107	29		164	290	166		301
			2,976	3,320	5,232				3,491	4,006			3,668
		L	50	0	0	0	0	5	55	0	0	21	71
	EB	T	332 643	375 892	572 1,099	197 207	53		385 699	510 557	135 -335		467 308
19		R L	14	1	4	3	56 1		15	4	3		17
Custer Way SE/North St SE	WB	T	245	265	465	200	54		299	412	147		392
Cleveland Ave SE		R	70	16	16	0	0		70	16	0		70
TMC Date: 02/40/45	A10	L T	481	529 195	706 269	177 74	48 20		529 153	205 269	-324 74		157 207
TMC Date: 02/10/15	NB	T R	133 15	195	6	4	20		153 16	269 9	74		207
Peak Hour: 4:45 - 5:45		L	106	18	27	9	2		108	26	8		114
PHF: .93	SB	T	279	208	315	107	29		308	279	71		350
		R	106 2,474	0 2,501	0 3,479	0 978	39%	10 9%	116 2,752	0 2,287	0 445	44	150 2,324
		L	48	51	36	-15	-4	- 5/6	44	36	-15	28	76
	EB	Т	268	255	485	230	62		330	463	208		476
		R	2	33	26	-7	-2		0	12	-21	1	3
20 Hondley St SE	WB	L T	10 395	0 183	0 404	0 221	0 60		10 455	0 378	0 195	6	16 590
Hoadley St SE North St SE	**D	R	50	183	14	-4	-1	 	49	14	-4	29	79
		L	1	20	18	-2	-1		0	7	-13	1	2
TMC Date: 06/24/15	NB	T	2	0	0	0	0		2	0	0	1	3
Beels Have 5 co. 5 co.	 	R	6 27	0 14	15 10	15 -4	4		10 26	8 10	8	3 16	9 43
Peak Hour: 5:00 - 6:00 PHF: .87	SB	L T	1	0	0	-4	-1 0	 	1	0	-4 0	1	2
		R	15	32	27	-5	-1		14	27	-5	9	24
			825	606	1,035				941	955	349	58%	1,321
		L	0	-	-	-	0		0	-	0		0
	EB	T R	0				0		0		0		0
21		R L	0	-	-	-	0		0	-	0		0
Deshcutes Way SW/I-5 NB Off Ramp	WB	T	0	-	-	-	0		0	-	0		0
E St SW		R	328	162	273	111	30		358	424	262		590
TMC Date: 06/25/15	AID.	L +	0 79	129	114	-15	0 -4		0 75	105	-24		0 55
INIC Date: 06/25/15	NB	T R	79 136	129 326	114 444	-15 118	-4 32		75 168	105 483	-24 157		293
Peak Hour: 4:45 - 5:45		L	278	214	303	89	24		302	420	206		484
PHF: .85	SB	T	0	-	-	-	0		0	-	0		0
		R	0	831	1.004	-	0		0	1,432	0		0
			821	831	1,134				903	1,432			1,422



						2022 Volumes				2040 Ba	sse Model	
		EXISTING	EXISTING	2040 EXISTING	BASE	7 YEAR	BASE	PROJECTED	2040 BASE	BASE	BASE	PROJECTED
Intersection	Movement	2015 VOLUMES	MODEL VOLUMES	MODEL VOLUMES	MODEL Δ GROWTH	GROWTH	MODEL ADJUST	2022 VOLUMES	MODEL VOLUMES	MODEL Δ GROWTH	MODEL ADJUST	2040 VOLUMES
	ı	90	295	399	104	28		118	264	-31		59
	EB 1		37	54	17	5		93	363	326		414
	F		209	294	85	23		278	277	68		323
22 Capitol Blvd SE	WB 1		63 50	145 90	82 40	22 11		137 102	589 326	526 276		641 367
E St SE	F		35	67	32	9		140	42	7		138
	L	216	112	183	71	19		235	98	-14		202
TMC Date: 06/25/15	NB 1		399	788	389	105		549	387	-12		432
0.110445.545	F		32	76	44	12		144	475	443		575 220
Peak Hour: 4:45 - 5:45 PHF: .86	SB 1		82 886	134 1521	52 635	14 171		205 758	111 1169	29 283		870
1111.330	55 F		0	0	0	0	12	84	0	0	62	134
		2,412	2,200	3,751	1,551	71%	16%		4,101	1,901	86%	4,375
	l	0	-	-	-	0		0	-	0		0
	EB 1		-	-	-	0		0	-	0		0
23	F		- 6	7	1	0		7	5	-1		6
Cleveland Ave SE	WB 1		-			0		0	-	0		0
South St SE	F		11	21	10	3		17	42	31		45
	l		-	-	-	0		0	-	0		0
TMC Date: 06/25/15	NB 1		703	931	228	61		632	1,046	343		914
Peak Hour: 4:30 - 5:30	F		18	8 33	0 15	0 4		11 19	7 65	-1 47		10 62
Peak Hour: 4:30 - 5:30 PHF: .88	SB 1		1069	1356	287	77		931	1434	365		1,219
	SB F		-	-	-	0		0		0		0
		1,472	1,815	2,356					2,599			2,256
	ı		5	8	3	1		22	9	4		25
	EB 1		171	163	-8	-2		140	182	11		153
24	F					0		1		0		1
7th Ave SW	WB 1		284	374	90	24	1	285	366	82	1	343
Linwood Ave SW	F		154	95	-59	-16		208	103	-51		173
	l l	0		-	-	0		0		0		0
TMC Date: 06/30/15	NB 1		-	-	-	0		0	-	0		0
Peak Hour: 5:00 - 6:00	F		134	227	93	0 25		1 147	233	0 99		1 221
Peak Hour: 5:00 - 6:00 PHF: .93	SB 1		134	- 221	93	0		0	233	0		0
1111. 333	55 F		6	10	4	1		18	10	4		21
		789	754	877				822	903			938
	l		3	86	83	22		52	104	101		131
	EB 1		258	228	-30	-8		155	241	-17		146
25	F		43 170	74 308	31 138	8 37		108 137	71 320	28 150		128 250
25 2nd Ave SW	WB 1		309	371	62	17		264	368	59		306
Linwood Ave SW	F		28	28	0	0		58	37	9		67
	ı	104	47	115	68	18		122	123	76		180
TMC Date: 06/30/15	NB 1		15	166	151	41		157	202	187		303
2011000445 545	F		163	150 304	-13	-4		90	132	-31		63
Peak Hour: 4:45 - 5:45 PHF: .89	SB 1		190 78	202	114 124	31 33		97 197	302 246	112 168		178 332
1111.33	55 F		81	146	65	18		143	137	56		181
		1,367	1,385	2,178				1,580	2,283			2,265
	L		291	260	-31	-8		157	243	-48		117
	EB 1		-	-	-	0	5	5	-	0	5	5 257
26	F		320	423	103	28 0	15	174 15	431	111 0	15	15
Capitol Blvd SE	WB 1		-			0	5	5		0	5	5
Linwood Ave SW	F	0	<u> </u>	-	-	0	10	10		0	10	10
	L		169	212	43	12		167	228	59		214
TMC Date: 06/25/15	NB 1		251	788	537	145		772	716	465		1,092
Peak Hour: 4:45 - 5:45	F	0				0	15 10	15 10		0	15 10	15 10
PHF: .84	SB 1	706	818	1464	646	174		880	1538	720		1,426
	F	240	339	495	156	42		282	497	158		398
		2,039	2,188	3,642				2,492	3,653			3,564
	EB 1		942	5 1,156	3 214	1 58		8 739	5 1,214	3 272		10 953
	EB 1		942	1,156	40	58 11		739 169	1,214	35		953 193
27	ı.		488	607	119	32		461	567	79		508
Henderson Blvd	WB 1	503	635	814	179	48		551	911	276		779
Yelm Hwy SE	F		15	19	4	1		81	19	4		84
TMC Date: 05/35/45	L NO 3		62	102	40	11		120	94	32		141
TMC Date: 06/25/15	NB T		42 435	78 516	36 81	10 22		176 666	78 491	36 56		202 700
Peak Hour: 4:45 - 5:45	ı,		16	108	92	25		179	90	74		228
PHF: .91	SB 1	207	85	188	103	28		235	214	129		336
	F		3	8	5	1		23	9	6		28
		3,160	2,815	3,731				3,408	3,817			4,162
	EB 1		36 129	108 232	72 103	19 28		54 205	110 215	74 86		109 263
	EB 1		129	- 232	103	0		0	- 215	0		0
28	, i		-	-	-	0		0	-	0		0
Rural Rd SW	WB 1		185	320	135	36		330	317	132		426
Trosper Rd SW	F		117	149	32	9		108	154	37		136
73.40 P. (1) (1-1)	L	0	-	-	-	0		0		0		0
TMC Date: 06/25/15	NB 1					0		0		0		0
Peak Hour: 4:30 - 5:30	l l		121	150	29	8		97	180	59		148
PHF: .92	SB 1	0	-	-	-	0		0	-	0		0
	F		54	194	140	38		98	159	105		165
		754	642	1,153				892	1,135			1,247



						2022 Volumes				2040 Ba	se Model	
		EXISTING	EXISTING	2040 EXISTING	BASE	7 YEAR	BASE	PROJECTED	2040 BASE	BASE	BASE	PROJECTED
Intersection	Movement	2015 VOLUMES	MODEL VOLUMES	MODEL VOLUMES	MODEL Δ GROWTH	GROWTH	MODEL ADJUST	2022 VOLUMES	MODEL VOLUMES	MODEL Δ GROWTH	MODEL ADJUST	2040 VOLUMES
	L	11	2	2	0	0		11	2	0		11
	EB T	251	361	511	150	40		291	524	163		414
29	R L	44 51	-	-	-	0	3	47 54	-	0	11 12	55 63
Lake Park Dr	WB T	369	373	542	169	46	,	415	544	171	12	540
Trosper Rd SW	R	52	61	155	94	25		77	164	103		155
	L	62	-	-	-	0	4	66	-	0	15	77
TMC Date: 03/05/14	NB T	25 56	-	-	-	0	3	27 59	-	0	6 13	31 69
Peak Hour: 4:45 - 5:45	L	40	63	176	113	30	,	70	185	122	13	162
PHF: .98	SB T	19	-	-	-	0	1	20	-	0	5	24
	R	13 993	1 861	1,387	0	0	6%	13 1,149	1,420	0 559	24%	13
		40	60	95	35	9	6%	49	1,420	47	24%	87
	EB T	264	313	505	192	52		316	483	170		434
	R	109	51	86	35	9		118	118	67		176
30	WB T	368 297	90 282	192 390	102	27 29		395 326	153	63 69		431 366
2nd Ave SW/Littlerock Rd SW Trosper Rd SW	WB T	32	32	390	108 6	29		34	351 18	-14		18
	L	187	75	171	96	26		213	215	140		327
TMC Date: 03/05/14	NB T	216	69	251	182	49		265	266	197		413
Beels Have 4 20 5 20	R L	396	90	257 138	167	45		441	167	77		473
Peak Hour: 4:00 - 5:00 PHF: .98	SB T	100 236	77 108	138 338	61 230	16 62		116 298	142 361	65 253		165 489
	R	44	77	137	60	16		60	142	65		109
		2,289	1,324	2,598				2,631	2,523			3,488
	L	156	182	234	52	14		170	233	51		207
	EB T	540 19	297	666	369 0	99		639 19	559 0	262 0	6	802 25
31	L	244	205	277	72	19		263	238	33		277
I-5 SB Ramps/Tyee Dr	WB T	322	216	285	69	19		341	233	17		339
Trosper Rd SW	R	191 25	298	483 0	185	50 0		241	505 0	207	8	398 33
TMC Date: 03/05/14	L NB T	158	40	157	117	32		25 190	38	-2	8	156
Time Bate. 03/03/14	R	335	463	495	32	9		344	564	101		436
Peak Hour: 4:30 - 5:30	L	460	380	266	-114	-31		429	306	-74		386
PHF: .95	SB T	327	172	182	10	3		330	277	105		432
	R	377 3,154	189 2,442	336 3,381	147	40		417 3,408	287 3,240	98 798	33%	475 3,966
	L	0	0	0	0	0		0	0	0	3370	0
	EB T	816	575	913	338	91		907	788	213		1,029
	R	524	566	647	81	22		546	707	141		665
32 I-5 NB Ramps	L WB T	0 588	550	817	267	0 72		0 660	976	0 426		0 1,014
Trosper Rd SW	R	617	903	899	-4	-1		616	798	-105	-100	412
	L	172	169	228	59	16		188	0	-169	-3	0
TMC Date: 03/05/14	NB T	0	0 112	-	-	6		0	- 470	0 66		0 145
Peak Hour: 4:30 - 5:30	R L	79 0	- 112	133	21	0		85 0	178	0		0
PHF: .93	SB T	0	-	-	-	0		0	-	0		0
	R	0	-	-	-	0		0	-	0		0
		2,796 282	2,875	3,637 228	454	- 11		323	3,447 391	24.4		3,265 596
	EB T	47	77	- 228	151	41 0	5	52	391	314 0	20	67
	R	579	611	685	74	20	_	599	510	-101	-20	458
33	L	29	-	-	-	0	3	32	-	0	21	50
Capitol Blvd SE Trosper Rd SW	WB T	70 33	-	-	-	0	7	77 36	-	0	180 17	250 50
rrosper Ka SW	R L	771	1,005	1,088	83	22	3	793	1,023	18	-100	689
TMC Date: 03/05/14	NB T	574	347	730	383	103		677	544	197		771
	R	11	-	-	-	0	1	12	-	0		11
Peak Hour: 4:30 - 5:30 PHF: .99	L SB T	13 466	771	1320	549	0 148	1	14 614	1311	0 540	20 -20	33 986
	SB I	348	448	628	180	48		396	750	302		650
		3,223	3,259	4,679	1,420	44%	10%		4,529			4,611
	L	261	159	307	148	40		301	136	-23		238
	EB T	5 40	0 12	0 19	7	0 2	0 4	5 46	12 65	12 53		17 93
34	L	13	0	0	0	0	1	14	0	0		13
Capitol Blvd SE	WB T	7	0	0	0	0	1	8	4	4		11
Lee St SW	R	81	68	69 10	1 4	0		81	72	74	100	85 197
TMC Date: 03/05/14	L NB T	23 1,025	6 1,124	1,442	4 318	1 86		24 1,111	80 1,359	74 235	100 -100	1,160
	R	21	0	0	0	0	2	23	0	0		21
Peak Hour: 4:30 - 5:30	L	50	59	83	24	6		56	77	18		68
PHF: .93	SB T	816 151	1170 153	1638 284	468 131	126 35		942 186	1622 122	452 -31		1,268 120
	R	2,493	2,751	3,852	1,101	40%	9%	2,797	3,549	-31		3,291
	L	0		-	-	0		0	-	0		0
	EB T	0	-	-	-	0		0	-	0		0
	R	0	-	-		0		0	-	0		0
35 Littlerock Rd SW	L WB T	129 3	37	46	9	0	1	131 3	47	10 0	-	139 3
Fred Meyer/Costco Drwy	WB I	114	27	32	5	1	1	115	50	23		137
	L	0	-	-	-	0		0	-	0		0
TMC Date: 06/24/15	NB T	652	207	647	440	118		770	597	390		1,042
Peak Hour: 4:30 - 5:30	R	95 103	20 17	36 19	16 2	4		99 104	32 20	12 3		107 106
Peak Hour: 4:30 - 5:30 PHF: .96	SB T	584	233	598	365	98		682	612	379		963
	R	0	-	-	-	0		0	-	0		0
		1,680	541	1,378				1,904	1,358			2,497



							2022 Volumes				2040 Ba	se Model	
			EXISTING	EXISTING	2040 EXISTING	BASE	7 YEAR	BASE	PROJECTED	2040 BASE	BASE	BASE	PROJECTED
Intersection	Movement	t	2015 VOLUMES	MODEL VOLUMES	MODEL VOLUMES	MODEL Δ GROWTH	GROWTH	MODEL ADJUST	2022 VOLUMES	MODEL VOLUMES	MODEL Δ GROWTH	MODEL ADJUST	2040 VOLUMES
		L	80	-	-	-	0		80	-	0	20	100
	EB	T	23	-	-	-	0		23	-	0	6	29
36		R L	15 125	160	170	10	3		15 128	131	-29	4	19 96
Littlerock Rd SW	WB	T	5	-	-	-	0		5	-	0	1	6
Costco Drwy		R	194	49	142	93	25		219	115	66		260
		L	51	-	-	-	0		51	-	0	13	64
TMC Date: 06/24/15	NB	T R	491 98	178 55	541 108	363 53	98 14		589 112	514 103	336 48		827 146
Peak Hour: 4:30 - 5:30		L	214	31	45	14	4		218	83	52		266
PHF: .95	SB	T	398	240	599	359	97		495	577	337		735
		R	80	742	4.505	470	0	420/	80	4.522	0	20	100
		_	1,774 0	713	1,605	170	58%	13%	2,015	1,523	810	25%	2,648
	EB	T	0	-	-		0		0		0		0
		R	0	-	-	-	0		0	-	0		0
37		L	178	0	0	0	0	24	202	5	5		183
Littlerock Rd SW Kingswood Dr SW	WB	T R	0 75	0	- 0	- 0	0	10	0 85	29	0 29		0 104
KillgJWOOd DI JW		L	0	-	-	-	0		0	-	0		0
TMC Date: 06/24/15	NB	T	496	233	649	416	112		608	587	354		850
		R	125	0	0	0	0	17	142	33	33		158
Peak Hour: 4:30 - 5:30 PHF: .93	SB	L T	59 519	0 400	0 769	0 369	0 99	8	67 618	32 675	32 275		91 794
FIII23	Jib	R	0	-	-	-	0		0	-	0		0
			1,452	633	1,418			13%	1,721	1,361			2,180
		L	22	-	-	-	0	2	24		0	8	30
	EB	T R	1 16				0	0	1 17		0	6	1 22
38		L L	10	11	37	26	7	-	17	36	25		35
Capitol Blvd SE	WB	T	1	=	-	-	0	0	1	-	0	0	1
X St SE		R	21	21	21	0	0		21	20	-1		20
TMC Date: 03/05/14	NB	L T	20 904	948	1,218	270	73	2	22 977	1,236	0 288	7	27 1,192
TWIC Date: 05/05/14	IND	R	12	8	17	9	2		14	16	8		20
Peak Hour: 4:15 - 5:15		L	36	32	31	-1	0		36	31	-1		35
PHF: .89	SB	T	712	977	1448	471	127		839	1453	476		1,188
		R	35	4.007	2 772	775	0	3	38	2.702	0	13	48
		L	1,790 6	1,997 0	2,772 0	775 0	39%	9%	2,008	2,792 0	0	36%	2,619 8
	EB	T	12	-	-	-	0	0	12	-	0	4	16
		R	9	31	30	-1	0		9	30	-1	3	12
39		L	4	-	-	-	0	0	4	-	0	1	5
Elm St SE X St SE	WB	T R	2	-	-	-	0	0	2	-	0	1	5 3
ASCSE		L	2	20	19	-1	0	Ů	2	19	-1	1	3
TMC Date: 06/25/15	NB	T	66	17	20	3	1		67	15	-2	24	90
		R	6	-	-	-	0	0	6	-	0	2	8
Peak Hour: 5:00 - 6:00 PHF: .74	SB	L T	0 44	20	25	5	0	0	0 45	18	-2	0 16	0 60
FIII74	36	R	5	0	0	0	0	0	5	0	0	2	7
			160	88	94	6	7%	2%	163	82		36%	218
		L	147	113	194	81	22		169	190	77		224
	EB	T R	41 28	2 35	3 53	1 18	5		41 33	3 42	7		42 35
40		L	28	15	31	16	4		32	28	13		41
Capitol Blvd SE	WB	Т	22	2	3	1	0		22	3	1		23
Dennis St SE/SW		R	75	105	106	1	0		75	104	-1		74
TMC Date: 03/05/14	NB	L T	12 688	23 682	36 867	13 185	4 50		16 738	33 867	10 185		22 873
53/53/14		R	23	16	25	9	2		25	33	17		40
Peak Hour: 4:30 - 5:15		L	52	74	71	-3	-1		51	69	-5		47
PHF: .91	SB	T R	576 71	763 100	1198 165	435 65	117 18		693 89	1187 156	424 56		1,000 127
		N.	1,763	1,930	2,752	US	10		1,984	2,715	30		2,548
		L	80	46	101	55	15		95	43	-3		77
	EB	T	131	32	144	112	30		161	183	151		282
		R	121	150	266 0	116	31	10	152	246	96	47	217
41 Capitol Blvd SE	WB	L T	94 193	6	111	105	0 28	10 21	104 214	0 98	0 92	97	141 290
Israel Rd SE/SW		R	135	0	79	79	21	15	150	64	64	68	203
		L	106	106	153	47	13		119	183	77		183
TMC Date: 06/25/15	NB	T	317	675	748	73	20		337	826	151	12	468
Peak Hour: 4:30 - 5:30	 	R L	25 71	0 125	0 304	0 179	0 48		25 119	0 187	62	13	38 133
PHF: .90	SB	T	514	654	882	228	61		575	1024	370		884
		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
	EB	L T	49 79	46 37	73 62	27 25	7		56 86	74 63	28 26		77 105
	EB	T R	0	-	-	-	0		0	-	0		0
42		L	0	-			0		0	-	0		0
Black Lake Belmore Rd SW	WB	T	90	42	88	46	12		102	87	45		135
66th Ave SW	 	R	107 0	25	122	97	26 0		133	126	101 0		208
TMC Date: 06/30/15	NB	L T	0			-	0		0		0		0
		R	0				0		0		0		0
Peak Hour: 4:30 - 5:30		L	69	37	89	52	14		83	92	55		124
PHF: .95	SB	T	0	- 52	180	128	0 34		0	120	0 87		0 140
		R	53 447	52 239	180 614	128	34		87	139 581	6/		789
				237	U14					301			,63



Part												2040 Ba	2040 Base Model				
	Intersection	Moveme	ent					7 YEAR									
1 2 1 2 1 2 1 2 1 2 1 1	mer section	Moveme	ct					GROWTH									
THE MATERIAL PARTY NAME AND ASSOCIATION ASSOCIATION AND ASSOCIATION AND ASSOCIATION ASSOCIATION ASSOCIATION AS			L														
Service of the control of the contro		EB															
Selection (1976) Market (1976) Mar	43		L														
The Control of Control		WB															
Marie 10-10-20-20 Marie 18 10-10-20-20 Marie 18 10-10-20-20 Marie 18 10-20-20-20-20-20-20-20-20-20-20-20-20-20	66th Ave SW																
Market C. G. 3.38 Market M. C. B. 3.1 Market M. C. B. 3.2 Market M. C. B. 3.2 Market M. C. B. 3.3 Market M. C. B. S. B. S. B.	TMC Date: 06/30/15	NB															
## 19																	
1 33 53 53 54 55 55 55 55																	
March Marc	PRF: .04	36															
1				412	200	513					515			727			
1																	
Secondary Williams		EB															
Object to 190 1	44								1				8				
THE CASE OF A STATE OF		WB	T														
PMC CASE OR OPENIS First Internal 2013 201 First Internal 201 First Internal 2013 201 First Internal 2013 201 First Internal 2013 201 First	Odegard Rd SW	-							0				3				
Pad Page 1 2	TMC Date: 06/24/15	NR															
## 19	, ,								0				2				
		\Box							1				4				
	PHF: .93	SB															
1 1 200 5 5 5 5 5 5 5 5 5								Ť	9%			Ť	50%				
Company Comp																	
Bernard Bet W		EB															
Universidation Uniter the Nove	45	 															
Text Care for (A) 1979 Annual Care for (A) 1979 Annual Care for (A) 1979 Annual Care for (A) 1970 Annual Care for (A) 197		WB															
The Date of 64/475 181 7 257 182 283 131 33 790 131 189 666 666 770 725 725 66 725 725 66 727 725 72	Israel Rd SW/70th Ave SW				109	348	239	64			277	168					
Presidence 419-1-509 10 1 10 11 115 115 125 125 46 1277 1275 10 121 115 115 115 125 125 125 127 127 127 127 127 127 127 127 127 127	THE DALL OF DALLS	AID															
Paul Sept - 19-10 - 19	TMC Date: 06/24/15	NB															
1 15 22 54 13 9 124 75 55 130	Peak Hour: 4:30 - 5:30			131						177	225			221			
1, 148	PHF: .95	SB															
1			R				32	9				54					
1 29 60 132 72 13 44 150 96 133			L				89	24				29					
Company by (1) Link		EB	T	166	105	272	167	45		211	339	234		400			
Lichorom Way \$LT Libro box William T 239 90 256 160 65 364 279 279 464 1																	
Trace Interval 60 W		WB															
TAC Clare Golf April 5 Peak Hour 4-30 - 5-30 Peak Hour 4-30 - 5-3																	
Peak Horr. 4:30 - 5:30 Fig. : 33 Fig. : 34 Fig. : 34 Fig. : 35 Fig. : 35 Fig. : 36			٢														
Peak Horn (4.30 - 5.00	TMC Date: 06/24/15	NB															
PHY: 33 58 T 81 100 1100 1100 590 141 1410 590 141 1410 590 141 1410 590 141 1410 590 141 1410 590 141 1410 590 141 1410 590 141 1410 590 141 1410 590 141 1410 1	Peak Hour: 4:30 - 5:30																
1,310 569 1,460 1,311 1,00 2,001		SB		81				11		92							
1			R				102	27				90					
EST T			_		659	1,480		0			1,620	0					
Control of Style		EB			-	-	-				-						
Utthereok did SW Temporater Blad SW R 278 129 278 149 40 1318 231 102 380 TMC Date 06/24/5					-	-	-				-						
Tumwater Bird SW R 278 129 278 149 40 318 231 102 330					217	487	270				387						
TMC Date: 06/24/15 NS		WB			129	278	149				231						
R				0		-	-	0		0	-	0		0			
Peak Hourt. 4:30 - 5:30 PHF: 94 Peak Hourt. 4:30 - 5:30 PHF: 88 PART	TMC Date: 06/24/15	NB															
PHF: 94 SB T 283 267 644 377 102 385 469 202 485 R O C C C C C C L O C C C C C E T 342 267 581 314 85 427 641 374 776 R 71 140 259 119 32 103 415 275 346 A8 L 319 473 639 166 45 386 499 26 345 A8 L 319 473 639 166 45 386 311 448 220 535 Tumwater Blvd SW R O C C C C C R T 0 C C C C C R T 0 C C C C R T 275 388 320 312 36 311 448 220 535 Tumwater Blvd SW R O C C C C C R T O C C C C C R T O C C C C C R T O C C C C R T O C C C C R T O C C C C R T O C C C R T O C C C R T O C C C R T O C C C R T O C C C R T O C C C R T O C C C R T O C C C R T O C C C R T O C C C R T O C C C R T O C C C R T O C C C R T O C C C R T T T T T T R T T T T T T R T T T T T T T R T T T T T T T R T T T T T T T R T T T T T T T R T T T T T T T T T	Peak Hour: 4:30 - 5:30	\vdash	R														
R		SB	T														
L			R				-	0				0					
E8 T 342 267 581 314 85 427 661 374 716 R R 71 140 259 1119 32 103 415 275 346 L 319 473 639 166 45 364 499 26 345 I-538 Ramps W8 T 275 188 320 132 36 311 448 260 535 Tumwater Blvd W					1,129	2,543		0			1,965	0		-			
48		EB			267	581	314				641						
1-558 Ramps				71	140	259	119	32		103	415	275		346			
Tumwater Blvd SW R 0 0 0 0 - 0 0 0		\Box															
L 0 0 0 0 - 0 0 0 0		WB			188	320	132				448						
Peak Hour: 4:30 - 5:30	Tullwater blyd 5W				-	-	-				<u>-</u>						
Peak Hour: 4:30 - 5:30	TMC Date: 06/24/15	NB				-	-				-						
PHF: 94 S8 T 32 0 0 0 0 32 0 0 32 0 0 32 1 6 516 R 234 166 453 287 77 311 448 282 516 1,1678 1,519 2,513 1,147 2,714 2,714 2,873 L 136 136 358 222 60 196 388 252 388 E8 T 611 415 484 69 19 630 516 101 712 R 0 0 0 0 0 - 0 0 0 0 0 0 0 0 0	Deels Heart 4 22 5 22	\vdash			205	261	- 24				262						
R 234 166 453 287 77 311 448 282 516		SB															
L 136 136 358 222 60 196 388 252 388				234	166	453				311	448			516			
E8 T 611 415 484 69 19 630 516 101 712 R 0 · · · · 0 0 0 · 0 · 0 0 1-5 NB Ramps WB T 550 553 767 214 58 608 703 150 700 Tumwater Blvd SW L 44 107 191 84 23 667 244 137 1812 TMC Date: 06/24/15 NB T 6 0 0 0 0 0 6 0 0 6 6 R 1355 233 297 64 17 1522 280 47 182 Peak Hour: 4:30-5:30																	
R 0 - - 0 0 - 0 0 0 0		ED															
49		LU			-13		-				-						
Tumwater Blvd SW R 1,209 485 466 -19 -5 1,204 364 -121 1,088 L 44 107 191 84 23 67 244 137 181 TMC Date: 06/24/15 NB T 6 0 0 0 0 0 0 6 0 0 6 0 0 6 6 R 135 233 297 64 17 152 280 47 182 Peak Hour: 4:30 -5:30 L 0 0 0 0 0 - 0 0 0 0 0 0 0 0	49			0			-			0	-			0			
L 44 107 191 84 23 67 244 137 181		WB															
TMC Date: 06/24/15 NB T 6 0 0 0 0 0 6 0 0 6 0 0 6 6 0 0 6 6 0 0 0 6 6 0 0 0 6 6 0 0 0 6 6 0 0 0 6 6 0 0 0 0 6 0	Tumwater Blvd SW	 															
Peak Hour: 4:30 - 5:30 L 0 0 0 0 - 0 0 0 PHF: 88 SB T 0 0 0 0 - 0 0 0 0 0 0 0 0 0 0 0	TMC Date: 06/24/15	NB			0												
PHF: 88 SB T 0 0 0 - 0 0 0 0 0 0 0 0 0 0 0 0																	
R 0 0 0 - 0 0		CD.															
	rn::88	36															
					1,929	2,563					2,495						



	2022 Volumes							2040 Base Model					
			EXISTING	EXISTING	2040 EXISTING	BASE	7 YEAR	BASE	PROJECTED	2040 BASE	BASE	BASE	PROJECTED
Intersection	Movem	ent	2015 VOLUMES	MODEL VOLUMES	MODEL VOLUMES	MODEL Δ GROWTH	GROWTH	MODEL ADJUST	2022 VOLUMES	MODEL VOLUMES	MODEL Δ GROWTH	MODEL ADJUST	2040 VOLUMES
		L	135	305	285	-20	-5		130	261	-44		91
	EB	T	550	183	354	171	46		596	288	105		655
		R	154	161	146	-15	-4		150	250	89		243
50 Linderson Way SE	WB	L T	56 702	72 417	259 611	187 194	50 52		106 754	148 522	76 105		132 807
Tumwater Blvd SW		R	31	110	99	-11	-3		28	109	-1		30
		L	168	179	178	-1	0		168	185	6		174
TMC Date: 03/03/15	NB	T	84	57	126	69	19		103	109	52		136
Peak Hour: 4:30 - 5:30	-	R L	43 189	32 139	69 123	37 -16	10 -4		53 185	63 161	31 22		74 211
PHF: .94	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
		L T	27	59 294	126 420	67 126	18 34		45 807	124 388	65 94		92 867
	EB	R	773 19	- 294	420	120	0	6	25	300	0	9	28
51		L	45	-	-	-	0	14	59	-	0	21	66
New Market St SW	WB	T	681	492	740	248	67		748	554	62		743
Tumwater Blvd SW		R	9	45	106	61	16		25	97	52		61
TMC Date: 03/03/15	AID.	L	16 2	-	-	-	0	5	21 3	-	0	7	23
TMC Date: 05/05/15	NB	T R	46	-	-		0	14	60	-	0	21	67
Peak Hour: 4:30 - 5:30		L	31	46	136	90	24		55	135	89		120
PHF: .92	SB	Т	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
	EB	L T	64 305	37 276	135 358	98 82	26 22		90 327	146 319	109 43		173 348
	LD	R	244	91	-	-	0		244	145	54		298
52		L	83	0			0	4	87	0	0	29	112
Capitol Blvd SE	WB	T	325	396	457	61	16		341	417	21		346
Tumwater Blvd SE	-	R	15	275	189	-86	-23	1	16	182	-93 26	5	20 225
TMC Date: 06/24/15	NB	L T	199 304	75 469	-		0		199 304	101 680	26 211		225 515
TWC Date: 00/24/13	ND	R	18	0	-		0	1	19	0	0		18
Peak Hour: 4:30 - 5:30		L	112	125	159	34	9		121	0	-125	39	151
PHF: .90	SB	T	475	546	-	-	0		475	1050	504		979
		R	106	133	389	256	69		175	221	88		194
			2,250	2,423 4	1,687	445 8	18% 2	4%	4	3,261 12	838	35%	3,379 10
	EB	L T	843	475	574	99	27		870	534	59		902
		R	54	45	97	52	14		68	95	50		104
53		L	64	68	123	55	15		79	125	57		121
Wildflower St SE/65th Ave SE	WB	T	526	529	672	143	39		565	646	117		643
Henderson Blvd SE	-	R	1 26	7	18 69	11 35	3 9		4 35	18 65	11 31		12 57
TMC Date: 07/01/15	NB	T	0	0	0	0	0		0	0	0		0
		R	46	37	69	32	9		55	74	37		83
Peak Hour: 4:30 - 5:30		L	1	4	11	7	2		3	12	8		9
PHF: .91	SB	T	0	0	0	0	0		0	0	0		0
		R	1,563	3 1,206	9 1,654	6	2		2	8 1,589	5		5 1,946
		L	651	399	532	133	36		687	502	103		754
	EB	T	0	-	-	-	0		0	-	0		0
		R	12	29	100	71	19		31	10	-19	12	5
54		L	0	-	-	-	0		0	-	0		0
Tumwater Blvd SE Henderson Blvd SE	WB	T R	0	-		-	0		0		0		0
		L	22	4	10	6	2		24	10	6		28
TMC Date: 11/13/14	NB	Т	165	126	151	25	7		172	139	13		178
		R	0	-	-	-	0		0	-	0		0
Peak Hour: 4:30 - 5:30 PHF: .91	SB	L T	0 197	156	226	70	0 19		0 216	257	0 101		0 298
51	- 55	R	323	410	524	114	31		354	462	52		375
			1,370	1,124	1,543				1,484	1,380			1,638
		L	0				0		0	-	0		0
	EB	T	152	74	95	21	6		158	91	17		169
55	+	R L	88 97	70 108	90 219	20 111	5 30		93 127	124 120	54 12		142 109
Trails End Dr SE	WB	T	139	77	107	30	8		147	146	69		208
Henderson Blvd SE		R	0	-	-	-	0		0	-	0		0
	\Box	L	53	68	90	22	6		59	94	26		79
TMC Date: 06/24/15	NB	T R	0 52	- 56	- 66	10	3		0 55	- 58	0 2		0 54
Peak Hour: 5:00 - 6:00	 	L L	0	-	-	0	0		0	-	0		0
PHF: .87	SB	T	0	-	-	-	0		0	-	0		0
		R	0	-	-	-	0		0	-	0		0
			581	453	667				639	633			761
	EB	L T	0	143 0	275 3	132 3	36 1	0	5	277 3	134	2 25	6 25
	FR	T R	7	31	103	72	19	1	8	101	70	25 4	25 11
56	 	L	0	4	53	49	13	0	0	52	48	100	100
Littlerock Rd SW	WB	T	0	0	2	2	1	0	0	2	2	50	50
Black Hills High School Drwy		R	0	22	144	122	33	0	0	35	13	25	25
THE D. I	NE	L	9	21	102	81	22	1	10	95	74	5	14
TMC Date: 06/24/15	NB	T R	158 0	129 4	295 64	166 60	45 16	0	203	246 61	117 57	50	275 50
Peak Hour: 4:30 - 5:30	 	R L	0	36	0	-36	-10	0	0	43	7	25	25
PHF: .96	SB	Т	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



			2022 Volumes 2040 Base Model									
		EXISTING	EXISTING	2040 EXISTING	BASE	7 YEAR	BASE	PROJECTED	2040 BASE	BASE	BASE	PROJECTED
Intersection	Movement	2015 VOLUMES	MODEL VOLUMES	MODEL VOLUMES	MODEL Δ GROWTH	GROWTH	MODEL ADJUST	2022 VOLUMES	MODEL VOLUMES	MODEL Δ GROWTH	MODEL ADJUST	2040 VOLUMES
	L	48	42	88	46	12		60	78	36		84
	EB T	9	-	-	-	0		9	-	0	5	14
57	R L	8	0	0	0	0		8	0	0	1 5	13
Center St SW	WB T	9	-		-	0		9		0	5	14
76th Ave SW	R	21	-	-	-	0		21	-	0	12	33
7140 0 02/02/45	L NB T	247	0 225	0 286	0 61	0 16		1 263	0 279	0 54	1	301
TMC Date: 03/03/15	NB T	0		- 286	- 61	0		0	- 279	0	0	0
Peak Hour: 4:45 - 5:45	L	10	-		-	0		10		0	6	16
PHF: .92	SB T	311	247	334	87	23		334	361	114		425
	R	38 703	56 570	228 936	172	46		84 800	183 901	127 331	58%	165
	L	16	-	-		0		16	-	0	9	25
	EB T	6	-	-	-	0		6	-	0	3	9
	R	7	-	-	-	0		7	-	0	4	11
58 Old Hwy 99	WB T	142 6	75	102	27	7		149 6	140	65 0	3	207 9
Henderson Blvd SE	R	51	70	95	25	7		58	100	30	-	81
	L	2	-	-	-	0		2	-	0	1	3
TMC Date: 06/23/15	NB T	512 111	544 71	640 91	96 20	26 5		538 116	755 87	211 16		723 127
Peak Hour: 4:15 - 5:15	L	105	73	94	21	6		111	127	54		159
PHF: .87	SB T	813	666	855	189	51		864	1205	539		1,352
	R	11	1.100	1.022	-	0		11	2.44	0	6	17
	L	1,782	1,499	1,877		0		1,884	2,414	165 0	57% 0	2,724
	EB T	1			-	0		1		0	0	1
	R	10	-	-	-	0		10	-	0	1	11
59	L L	11 0	64	84	20	5		16 0	83	19	_	30 0
Old Hwy 99 79th Ave SE	WB T	111	73	82	9	2		113	- 86	0 13	0	124
	L	1		Ē	-	0		1	-	0	0	1
TMC Date: 10/28/14	NB T	432	543	650	107	29		461	756	213		645
Peak Hour: 4:30 - 5:30	R L	15 131	53 68	61 1	-67	-18		17 113	60 67	7 -1		22 130
PHF: .95	SB 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
	EB T	0	-	-	-	0		0	-	0		0
	R	0	-	-	-	0		0	-	0		0
60	L	43	63	78	15	4		47	73	10		53
Kimmie St SW	WB T	0	-	-	-	0		0	-	0		0
83rd Ave SW	R	17 0	0	-	0	0		17 0	0	0		17 0
TMC Date: 03/03/15	NB T	29	49	94	45	12		41	84	35		64
	R	16	36	34	-2	-1		15	34	-2		14
Peak Hour: 4:30 - 5:30 PHF: .82	SB T	3 62	73	0 267	0 194	0 52		3 114	0 221	0 148		3 210
F1II02	R R	0	-	-	- 134	0		0	-	0		0
		170	221	473				237	412			361
	L	70	36	34	-2	-1		69	34	-2		68
	EB T	25 0	10	-	-10	-3 0		0	0	-10 0		15 0
61	L	0	-		-	0		0		0		0
Center St SW	WB T	11	4	5	1	0		11	5	1		12
83rd Ave SW	R	89	77	148	71	19		108	126	49		138
TMC Date: 03/03/15	NB T	0			-	0		0	-	0		0
	R	0	-	-	-	0		0	-	0		0
Peak Hour: 4:45 - 5:45 PHF: .88	L SB T	156 0	191	359	168	45 0	-	201 0	309	118 0	-	274 0
F107-00	SB I	72	63	78	15	4		76	73	10		82
		423	381	624				487	547			589
	L	179	170	201	31	8	18	205	230	60		239
	EB T	7 25	19	- 18	-1	0	2	8 27	- 18	0 -1		7 24
62	L	2				0	0	2	-	0		2
Old Hwy 99	WB T	4	-		-	0	0	4	-	0		4
88th Ave SE	R L	6	13	18	- 5	0	0	1 8	14	0		7
TMC Date: 06/23/15	NB T	269	357	417	60	16	27	312	486	129		398
	R	0	-	-	-	0	0	0	-	0		0
Peak Hour: 4:30 - 5:30	L	0	-		-	0	0	0	-	0		0
PHF: .90	SB T	671 173	487 174	659 285	172 111	46 30	67 17	784 220	748 510	261 336	-	932 509
		1,337	1,220	1,598			0		2,006			2,123
	L	0		-	-	0		0	-	0		0
	EB T	296 32	259 51	371 107	112 56	30 15		326 47	376 115	117 64		413 96
63	R L	143	166	107	-55	-15 -15		128	115	-59		96 84
I-5 SB Ramps	WB T	124	127	341	214	58		182	309	182		306
93rd Ave SW	R	0	-	-	-	0		0	-	0		0
TMC Date: 06/23/15	NB T	0				0		0		0		0
1NIC Date: 00/23/13	NB I	0	-	-	-	0		0	-	0		0
Peak Hour: 5:00 - 6:00	L	499	491	563	72	19		518	466	-25		474
PHF: .88	SB T	0	0 246	0	0 116	0	-	0 214	0	0	-	0 423
	R	283 1,377	1,340	362 1,855	110	31		314	386 1,759	140		1,796
		,,,,,,										



							2022 Volumes			2040 Base Model				
			EXISTING	EXISTING	2040 EXISTING	BASE	7 YEAR	BASE	PROJECTED	2040 BASE	BASE	BASE	PROJECTED	
Intersection	Move	ement	2015	MODEL	MODEL	MODEL		MODEL	2022	MODEL	MODEL	MODEL	2040	
			VOLUMES	VOLUMES	VOLUMES	Δ GROWTH	GROWTH	ADJUST	VOLUMES	VOLUMES	Δ GROWTH	ADJUST	VOLUMES	
		L	246	190	248	58	16		262	233	43		289	
	EB	Т	504	560	686	126	34		538	609	49		553	
		R	0	-	-	-	0		0	-	0		0	
64		L	0	-	-	-	0		0	-	0		0	
I-5 NB Ramps	WB	T	251 339	247 294	323 400	76 106	20 29		271 368	286 382	39 88		290 427	
93rd Ave SW		R												
	NB	L T	47 0	46 0	129 0	83	22		69 0	129 0	83 0		130	
TMC Date: 06/23/15	NB	T R	113	131	172	41	11		124	171	40		153	
Peak Hour: 4:30 - 5:30		L L	0	131	1/2	41	0		0	1/1	0		0	
PHF: .94	SB	T	0	-	-	-	0		0		0		0	
PHF: .94	28	R	0	-	-	-	0		0	-	0		0	
		R	1,500	1,468	1,958	-	U		1.632	1,810	0		1.842	
			25	1,466	1,958	30	8		33	162	28		53	
	EB	T	462	518	662	144	39		501	591	73		535	
	EB	R	15	39	32	-7	-2		13	27	-12		3	
65		L	3	0	0	0	0		3	0	0		3	
Kimmie St SW	WB	T	408	317	414	97	26		434		65		473	
93rd Ave SW	WB	R	6	11	18	7	26		8	382 18	7		13	
asia Ave 2M		R L	15	36	34	-2	-1		14	34	-2		13	
TMC Date: 06/23/15	NR	T T	15	3b 1	34 6	-2 5	-1 1		2	34 1	-2		13	
TIVIC Date: U0/23/13	NB	T R	10	0	0	0	0		10	0	0		10	
Peak Hour: 4:15 - 5:15		R	5	18	72	54	15		20	41	23		28	
Peak Hour: 4:15 - 5:15 PHF: .94	SB	T T	4	8	15	7	2		6	19	11		15	
РНF: .94	SB	T R	48	8 188	15 274	7 86	23	-	71	19 252	11 64		112	
		К	1,002	1,270	1,691	90	23		1,115	1,527	04		1,259	
		L	2	0	0	0	0		2	0	0		2	
	EB	T T	316	355	550	195	0 53		369	475	120		436	
1	tВ	T R	316 167	355 159	160	195	0		369 167	134	-25		436 142	
66		R L	167	71	262	191	51		167	255	-25 184		238	
Case Rd SW	WB	T	295	190	282	92	25		320	253	63		358	
****	WB	R	295	190 48	115	67	18		46	253 87	39		67	
93rd Ave SW		L L	82	122	128	6	2		84	123	1		83	
TMC Date: 06/23/15	NB	T T	19	40	51	11	3		22	58	18		37	
TMC Date: 06/23/15	NB	R	32	59	71	12	3		35	78	19		51	
Peak Hour: 4:30 - 5:30			51	122	282	160	43		94	212	90		141	
	SB	L T	48				43		52		34		82	
PHF: .92	28	R	1	86 0	100	14 0	0		1	120 0	0		1	
		R	1,095	1,252	2,001	U	U		1,297	1,795	U		1,638	
		L	0	1,252	2,001		0		0	1,795	0		0	
	EB	T	238	247	490	243	65		303	395	148		386	
	FR	R	157	290	490	123	33		190	370	80		237	
67		I I	86	66	119	53	14		100	245	179		265	
Tilley Rd SW (south leg)	WB	T	236	236	531	295	79		315	485	249		485	
93rd Ave SW	WD	R	0	230	331	295	0		0	465	0		0	
95rd AVE 5W		ı	132	73	129	56	15		147	110	37		169	
TMC Date: 06/23/15	NB	T	0	/3	129	36	0		0	110	0		0	
TWC Date: 06/23/15	IND	R	65	57	68	11	3		68	79	22		87	
Peak Hour: 4:30 - 5:30		ı	0	37	- 08	- 11	0		0	73	0		0	
Peak Hour: 4:30 - 5:30 PHF: .87	SB	T	0	 		<u> </u>	0		0		0		0	
FIII07	30	R	0				0		0		0		0	
		Α	914	969	1.750		- ŭ		1.123	1.684	Ü		1,629	
			113	114	108	-6	-2		1,125	116	2		1,629	
	EB	T	190	190	450	260	70		260	358	168		358	
	LD	R	0	0	0	0	0		0	0	0		0	
68		L	0	3	3	0	0		0	3	0		0	
Tilley Rd SW (north leg)	WB	T	94	169	477	308	83		177	415	246		340	
93rd AVE SW		R	12	14	51	37	10		22	68	54		66	
		L	0	0	0	0	0		0	0	0		0	
TMC Date: 06/23/15	NB	T	0	0	3	3	1		1	3	3		3	
		R	0	0	2	2	1		1	2	2		2	
Peak Hour: 4:30 - 5:30		L	14	23	108	85	23		37	179	156		170	
PHF: .86	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	
		L	16	4	3	-1	0		16	5	1		17	
	EB	T	0	-		-	0		0		0		0	
		R	155	123	196	73	20		175	171	48		203	
69		L	0	-		-	0		0	-	0		0	
Old Hwy 99 SE	WB	T	0	-	-	-	0		0		0		0	
93rd Ave SW	<u> </u>	R	0	-		-	0		0		0		0	
		L	70	114	284	170	46		116	236	122		192	
TMC Date: 06/23/15	NB	T	213	366	433	67	18		231	495	129		342	
		R	0	-	-	-	0		0	-	0		0	
Peak Hour: 4:30 - 5:30		L	0	-	-	-	0		0		0		0	
PHF: .92	SB	T	630	503	672	169	46		676	761	258		888	
		R	28	4	5	1	0		28	6	2		30	
				1,114	1,593	479	43%	10%	1,242	1,674			1,672	
			1,112											



Tumwater Transportation Master Plan

			Lin <u>k V</u>	olumes				Link Ca	apacity					Volume to C	apacity Ratio		
			sting		aseline		sting	2040 B			ith Imp		ting	2040 E	aseline	2040 W	Vith Imp
		APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART
Intersection	Movement	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK
	EB	129	65	165	83	550	550	550	550	550	550	0.23	0.12	0.30	0.15	0.30	0.15
1	11.00	216	250	345	201	550	550	550	550	550	550	0.39	0.47	0.63	0.53	0.00	0.50
RW Johnson Blvd SW Mottman Rd SW	WB	216	259	345	291	550	550	550	550	550	550	0.39	0.47	0.63	0.53	0.63	0.53
TMC Date: 06/30/15	NB	294	206	387	328	550	550	550	550	550	550	0.53	0.37	0.70	0.60	0.70	0.60
Deals Haven Add 5 545																	
Peak Hour: 4:15 - 5:15 PHF: .92	SB	156	265	224	419	550	550	550	550	550	550	0.28	0.48	0.41	0.76	0.41	0.76
																-	
		795															
	EB	453	498	468	613	550	550	550	550	550	550	0.82	0.91	0.85	1.11	0.85	1.11
	EB	433	430	400	013	550	550	550	550	550	550	0.82	0.91	0.85	1.11	0.85	1.11
2																	
Crosby Blvd SW	WB	102	538	162	540	450	450	450	450	450	450	0.23	1.20	0.36	1.20	0.36	1.20
Mottman Rd SW																	
TMC Date: 10/08/2014	NB	556	659	831	887	1800	1800	1800	1800	1800	1800	0.31	0.37	0.46	0.49	0.46	0.49
Peak Hour: 4:30 - 5:30																	
PHF: .89	SB	1,175	591	1,573	994	1800	1800	1800	1800	1800	1800	0.65	0.33	0.87	0.55	0.87	0.55
		2,286															
	EB	108	158	167	178	450	450	450	450	450	450	0.24	0.35	0.37	0.40	0.37	0.40
3																	
Crosby Blvd SW	WB	228	194	307	226	450	450	450	450	450	450	0.51	0.43	0.68	0.50	0.68	0.50
Irving St SW																	
TMC Date: 10/08/2014	NB	330	466	566	741	750	750	750	750	750	750	0.44	0.62	0.75	0.99	0.75	0.99
TWIC Date: 10/06/2014	IND	330	400	300	741	730	730	730	730	730	730	0.44	0.02	0.75	0.55	0.75	0.55
Peak Hour: 4:45 - 5:45																	
PHF: .89	SB	681	529	909	804	1800	1800	1800	1800	1800	1800	0.38	0.29	0.51	0.45	0.51	0.45
		1,347															
	EB	182	195	258	277	450	450	450	450	450	450	0.40	0.43	0.57	0.61	0.57	0.61
4 7th Ave SW	WB	20	13	28	18	450	450	450	450	450	450	0.04	0.03	0.06	0.04	0.06	0.04
Irving St						730	730	430	730	730	430	0.04	0.03	0.00	0.04	0.00	0.04
	_																
TMC Date: 06/30/15	NB	178	170	252	241	450	450	450	450	450	450	0.40	0.38	0.56	0.54	0.56	0.54
Peak Hour: 4:45 - 5:45																	
PHF: .92	SB	8	10	11	14	450	450	450	450	450	450	0.02	0.02	0.03	0.03	0.03	0.03
		388															



Tumwater Transportation Master Plan

			Lin <u>k V</u>	olumes				Link C	apacity					Volume to C	apacity Ratio		
			sting		aseline		sting	2040 B			ith Imp		ting	2040 E	aseline	2040 W	/ith Imp
la terresida e		APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART
Intersection	Movement	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK
	EB	10	26	11	25	450	450	450	450	450	450	0.02	0.06	0.02	0.06	0.02	0.06
5 Crosby Blvd SW	WB	202	242	299	348	450	450	450	450	450	450	0.45	0.54	0.66	0.77	0.66	0.77
Barnes Blvd SW	WB	202	242	299	348	450	450	450	450	450	450	0.45	0.54	0.00	0.77	0.00	0.77
TMC Date: 06/30/15	NB	84	122	213	288	450	450	450	450	450	450	0.19	0.27	0.47	0.64	0.47	0.64
Peak Hour: 5:00 - 6:00																	
PHF: .91	SB	371	277	640	502	750	750	750	750	750	750	0.49	0.37	0.85	0.67	0.85	0.67
		667															
	EB	239	481	278	622	750	750	750	750	750	750	0.32	0.64	0.37	0.83	0.37	0.83
	ED	233		2,0	- OLL	730	730	730	730	730	730	0.32	0.04	0.57	0.03	0.57	0.03
6																	
Black Lake Belmore Rd SW	WB	433	275	659	423	750	750	750	750	750	750	0.58	0.37	0.88	0.56	0.88	0.56
Black Lake Blvd SW																	
TMC Date: 06/30/15	NB	283	199	442	334	450	450	450	450	450	450	0.63	0.44	0.98	0.74	0.98	0.74
Peak Hour: 4:30 - 5:30																	
PHF: .94	SB	0	0	0	0	0	0	0	0	0	0						
		955															
	EB	37	66	76	122	450	450	450	450	450	450	0.08	0.15	0.17	0.27	0.17	0.27
7																	
RW Johnson Blvd SW	WB	109	110	210	219	550	550	550	550	550	550	0.20	0.20	0.38	0.40	0.38	0.40
Sapp Rd SW																	
TMC Date: 06/30/15	NB	4	10	51	77	450	450	450	450	450	450	0.01	0.02	0.11	0.17	0.11	0.17
TWC Date. 00/30/13	140					430	430	430	430	430	450	0.01	0.02	0.11	0.17	0.11	0.17
Peak Hour: 4:45 - 5:45																	
PHF: .85	SB	120	84	237	156	550	550	550	550	550	550	0.22	0.15	0.43	0.28	0.43	0.28
		270															
	EB	0	0	0	0	0	0	0	0	0	0						
8 Sapp Rd SW	WB	77	89	243	213	450	450	450	450	450	450	0.17	0.20	0.54	0.47	0.54	0.47
Crosby Blvd SW															****		
TMC Date: 06/30/15	NB	200	169	428	430	550	550	550	550	550	550	0.36	0.31	0.78	0.78	0.78	0.78
Peak Hour: 5:00 - 6:00																	
PHF: .91	SB	127	146	221	249	550	550	550	550	550	550	0.23	0.27	0.40	0.45	0.40	0.45
		404															



Tumwater Transportation Master Plan

			Lin <u>k</u> V	olumes				Link C	apacity					Volume to C	apacity Ratio		
			sting		aseline		sting	2040 B	aseline		ith Imp		sting	2040 E	aseline	2040 V	Vith Imp
		APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART
Intersection	Movement	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK
	EB	33	33	113	157	450	450	450	450	450	450	0.07	0.07	0.25	0.35	0.25	0.35
9																	
Black Lake Belmore Rd SW 49th Ave SW	WB	194	111	279	157	450	450	450	450	450	450	0.43	0.25	0.62	0.35	0.62	0.35
45til AVE SW																	
TMC Date: 06/30/15	NB	162	184	291	325	450	450	450	450	450	450	0.36	0.41	0.65	0.72	0.65	0.72
Peak Hour: 4:15 - 5:15 PHF: .90	SB	216	277	404	448	450	450	450	450	450	450	0.48	0.62	0.90	1.00	0.90	1.00
FRF50	36	210	211	404	440	430	430	430	430	430	430	0.46	0.02	0.90	1.00	0.90	1.00
		605															
		40	24														
	Sunset	48	24	68	54	450	450	450	450	450	450	0.11	0.05	0.15	0.12	0.15	0.12
10																	
Capitol Blvd SE	Carlyon	96	135	232	226	550	550	550	550	550	550	0.17	0.25	0.42	0.41	0.42	0.41
Carlyon Ave SE/Sunset Way SE																	
TMC Date: 06/25/15	NB	541	905	1,033	1,638	1800	1800	1800	1800	1800	1800	0.30	0.50	0.57	0.91	0.57	0.91
TWC Date: 00/25/15	IND	341	303	1,033	1,030	1800	1000	1000	1000	1600	1800	0.50	0.50	0.57	0.91	0.57	0.91
Peak Hour: 4:30 - 5:30																	
PHF: .85	SB	869	490	1,554	969	1800	1800	1800	1800	1800	1800	0.48	0.27	0.86	0.54	0.86	0.54
		1,554															
		2,334															
	EB	0	0	0	0	0	0	0	0	0	0						
11 Deschutes Way SW	WB	0	305	0	307	1060	1060	1060	1060	1060	1060	0.00	0.29	0.00	0.29	0.00	0.29
I-5 NB On Ramp	VVD	0	303	U	307	1000	1000	1000	1000	1000	1000	0.00	0.29	0.00	0.29	0.00	0.29
TMC Date: 07/01/15	NB	370	303	415	405	550	550	550	550	550	550	0.67	0.55	0.75	0.74	0.75	0.74
Peak Hour: 4:30 - 5:30																	
PHF: .79	SB	461	223	572	275	550	550	550	550	550	550	0.84	0.41	1.04	0.50	1.04	0.50
		831															
	EB	0	447	0	544	1060	1060	1060	1060	1060	1060	0.00	0.42	0.00	0.51	0.00	0.51
						1000	1000	1000	1000	1000	1000	0.00	0.42	0.00	0.51	0.00	0.51
12																	
Deschutes Way SW	WB	0	0	0	0	0	0	0	0	0	0						
US 101 WB On Ramp																	
TMC Date: 07/01/15	NB	813	260	945	362	550	550	550	550	550	550	1.48	0.47	1.72	0.66	1.72	0.66
Peak Hour: 5:00 - 6:00																	
PHF: .92	SB	279	385	391	430	550	550	550	550	550	550	0.84	0.41	1.04	0.50	1.04	0.50
		1,092															



Tumwater Transportation Master Plan

ENGINEERING AND PLANNING SERVICES			Link V	olumes				Link C	apacity					Volume to C	apacity Ratio		
			sting		aseline		sting		aseline		ith Imp		sting	2040 E	Baseline	2040 V	Vith Imp
		APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART
Intersection	Movement	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK
	EB	151	215	206	304	450	450	450	450	450	450	0.34	0.48	0.46	0.68	0.46	0.68
13	11/0	0	0	0	0	0	0	0	0	0	0						
I-5 SB/US 101 EB Off Ramps/N 2nd Ave SW Desoto St SW	WB	0	0	0	0	0	0	0	U	0	0						
TMC Date: 06/30/15	NB	172	955	274	1,139	750	1500	750	1500	750	1500	0.23	0.64	0.37	0.76	0.37	0.76
Peak Hour: 4:30 - 5:30																	
PHF: .89	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						
	ED					U	U	U	U	U	U						
14																	
N 2nd Ave SW	WB	275	963	499	1,235	900	1800	900	1800	900	1800	0.31	0.54	0.55	0.69	0.55	0.69
Custer Way SW																	
TMC Date: 02/10/15	NB	172	353	333	549	750	750	750	750	750	750	0.23	0.47	0.44	0.73	0.44	0.73
Peak Hour: 4:45 - 5:45																	
PHF: .88	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
15																	
Boston St SW	WB	632	859	780	1,111	900	1800	900	1800	900	1800	0.70	0.48	0.87	0.62	0.87	0.62
Custer Way SW																	
TMC Date: 06/25/15	NB	151	539	116	502	450	450	450	450	450	450	0.34	1.20	0.26	1.12	0.26	1.12
TWIC Date: 00/23/13	IND	131	333	110	302	430	430	430	430	430	430	0.54	1.20	0.20	1.12	0.20	1.12
Peak Hour: 4:30 - 5:30																	
PHF: .95	SB	5	4	5	3	450	450	450	450	450	450	0.01	0.01	0.01	0.01	0.01	0.01
		1,664															
	EB	0	0	0	0	0	0	0	0	0	0						
16																	
Deschutes Way SW	WB	508	163	471	168	450	450	450	450	450	450	1.13	0.36	1.05	0.37	1.05	0.37
Boston St SW																	
		424	204	coc	470												
TMC Date: 07/01/15	NB	424	281	686	470	550	550	550	550	550	550	0.77	0.51	1.25	0.85	1.25	0.85
Peak Hour: 4:30 - 5:30																	
PHF: .93	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															
		1,220															



Tumwater Transportation Master Plan

			Link Vo	olumes				Link Ca	pacity					Volume to C	apacity R <u>atio</u>		
			sting	2040 B	aseline		sting	2040 B	aseline		ith Imp		ting	2040 E	aseline	2040 W	/ith Imp
		APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART
Intersection	Movement	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK
	EB	350	551	767	1,205	1800	1800	900	1800	900	1800	0.19	0.31	0.85	0.67	0.85	0.67
					,								0.02				
17																	
Cleveland Ave SE	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
Capitol Blvd SE																	
TMC Date: 06/25/15	NB	224	381	297	461	900	900	750	750	750	750	0.25	0.42	0.40	0.61	0.40	0.61
																	5.02
Peak Hour: 4:30 - 5:30																	
PHF: .88	SB	0	0	0	0	0	0	0	0	0	0						
		1,488															
		1,400															
	EB	865	593	1,117	741	1800	900	1800	900	1800	900	0.48	0.66	0.62	0.82	0.62	0.82
18		200	1000	640	200	1000	1000		1000		1000		0.01	0.00	0.50	0.00	0.50
Custer Way SE Capitol Blvd SE	WB	790	1092	612	900	1800	1800	900	1800	900	1800	0.44	0.61	0.68	0.50	0.68	0.50
Capitol Bivu SE																	
TMC Date: 02/10/15	NB	776	816	740	1,129	1800	1800	900	1800	900	1800	0.43	0.45	0.82	0.63	0.82	0.63
Peak Hour: 4:45 - 5:45																	
PHF: .90	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															
	EB	1,025	832	846	699	1800	1800	1800	900	1800	900	0.57	0.46	0.47	0.78	0.47	0.78
19																	
Custer Way SE/North St SE	WB	329	453	479	603	750	750	750	750	750	750	0.44	0.60	0.64	0.80	0.64	0.80
Cleveland Ave SE																	
TMC Date: 02/10/15	NB	629	936	386	675	1800	1800	900	1800	900	1800	0.35	0.52	0.43	0.38	0.43	0.38
Peak Hour: 4:45 - 5:45																	
PHF: .93	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															
	EB	318	411	555	615	750	750	750	750	750	750	0.42	0.55	0.74	0.82	0.74	0.82
	LD	310		333	015	730	730	730	730	730	730	0.42	0.55	0.74	0.02	0.74	0.02
20																	
Hoadley St SE	WB	455	301	685	528	750	750	750	750	750	750	0.61	0.40	0.91	0.70	0.91	0.70
North St SE																	
TMC Date: 06/24/15	NB	9	13	14	20	450	450	450	450	450	450	0.02	0.03	0.03	0.05	0.03	0.05
Time Bate. 00/ 2-1/ 13	IND					430	430	430	450	450	450	0.02	0.03	0.03	0.03	0.03	0.03
Peak Hour: 5:00 - 6:00																	
PHF: .87	SB	43	100	68	158	450	450	450	450	450	450	0.10	0.22	0.15	0.35	0.15	0.35
		825															
		825															



Tumwater Transportation Master Plan

ENGINEERING AND PLANNING SERVICES			Lin <u>k</u> Vo	olumes				Link C	apacity					Volume to C	apacity Ratio		
			sting		aseline		sting	2040 B	aseline		ith Imp		ting	2040 E	aseline	2040 V	With Imp
		APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART
Intersection	Movement	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK
	EB	0	0	0	0	0	0	0	0	0	0						
							-	-									
21																	
Deshcutes Way SW/I-5 NB Off Ramp	WB	328	414	590	777	550	550	1100	1100	1100	1100	0.60	0.75	0.54	0.71	0.54	0.71
E St SW																	
TMC Date: 06/25/15	NB	215	0	348	0	1060	1060	1060	1060	1060	1060	0.20	0.00	0.33	0.00	0.33	0.00
Peak Hour: 4:45 - 5:45																	
PHF: .85	SB	278	407	484	645	550	550	550	550	550	550	0.51	0.74	0.88	1.17	0.88	1.17
		821															
		821															
	EB	433	379	796	703	550	550	1100	1100	1100	1100	0.79	0.69	0.72	0.64	0.72	0.64
22																	
Capitol Blvd SE E St SE	WB	337	411	1,146	1,209	450	450	1800	1800	1800	1800	0.75	0.91	0.64	0.67	0.64	0.67
E 31 2E																	
TMC Date: 06/25/15	NB	792	957	1,209	1,834	2100	2100	2100	2100	2100	2100	0.38	0.46	0.58	0.87	0.58	0.87
Peak Hour: 4:45 - 5:45																	
PHF: .86	SB	850	665	1,224	629	1800	1800	1800	900	1800	900	0.47	0.37	0.68	0.70	0.68	0.70
		2,412															
	EB	0	0	0	0	450	450	450	450	450	450	0.00	0.00	0.00	0.00	0.00	0.00
23	1416					450	450	450	450	450	450	0.05	0.00	0.44	0.46	0.44	0.16
Cleveland Ave SE South St SE	WB	21	26	51	72	450	450	450	450	450	450	0.05	0.06	0.11	0.16	0.11	0.16
South St SE																	
TMC Date: 06/25/15	NB	582	861	924	1,225	1800	1800	1800	1800	1800	1800	0.32	0.48	0.51	0.68	0.51	0.68
Peak Hour: 4:30 - 5:30	SB	869	585	1,281	959	1800	1800	1800	1000	1800	1800	0.48	0.33	0.71	0.53	0.71	0.53
PHF: .88	28	869	585	1,281	959	1800	1800	1800	1800	1800	1800	0.48	0.33	0./1	0.53	0.71	0.53
		1,472															
	EB	163	278	178	364	550	550	550	550	550	550	0.30	0.51	0.32	0.66	0.32	0.66
24																	
24 7th Ave SW	WB	486	265	517	375	550	550	550	550	550	550	0.88	0.48	0.94	0.68	0.94	0.68
Linwood Ave SW																	
TMC Date: 06/30/15	NB	1	1	1	1	450	450	450	450	450	450	0.00	0.00	0.00	0.00	0.00	0.00
Peak Hour: 5:00 - 6:00																	
PHF: .93	SB	139	245	242	198	450	450	450	450	450	450	0.88	0.48	0.94	0.68	0.94	0.68



Tumwater Transportation Master Plan

			Lin <u>k</u> Vo	olumes				Link C	apacity					Volume to C	apacity Ratio		
			sting		aseline		sting	2040 B			ith Imp		ting	2040 E	aseline	2040 W	/ith Imp
		APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART
Intersection	Movement	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK
	EB	293	476	405	667	550	550	550	550	550	550	0.53	0.87	0.74	1.21	0.74	1.21
25																	
2nd Ave SW	WB	405	323	623	387	550	550	550	550	550	550	0.74	0.59	1.13	0.70	1.13	0.70
Linwood Ave SW																	
TMC Date: 06/30/15	NB	314	364	546	710	750	750	750	750	750	750	0.42	0.49	0.73	0.95	0.73	0.95
Peak Hour: 4:45 - 5:45																	
PHF: .89	SB	355	204	691	501	750	750	750	750	750	750	0.47	0.27	0.92	0.67	0.92	0.67
		1,367															
	EB	311	395	379	617	550	550	550	550	550	550	0.57	0.72	0.69	1.12	0.69	1.12
26 Capitol Blvd SE	WB	0	0	30	30	450	450	450	450	450	450	0.00	0.00	0.07	0.07	0.07	0.07
Linwood Ave SW				30	30	430	430	430	430	430	430	0.00	0.00	0.07	0.07	0.07	0.07
TMC Date: 06/25/15	NB	782	852	1,321	1,698	2100	2100	2100	2100	2100	2100	0.37	0.41	0.63	0.81	0.63	0.81
Peak Hour: 4:45 - 5:45																	
PHF: .84	SB	946	792	1,834	1,219	2100	2100	2100	2100	2100	2100	0.45	0.38	0.87	0.58	0.87	0.58
		2,039															
	EB	846	634	1,156	948	1800	1800	2100	2100	2100	2100	0.47	0.35	0.55	0.45	0.55	0.45
	LU	040	034	1,130	340	1000	1800	2100	2100	2100	2100	0.47	0.55	0.55	0.45	0.55	0.45
27																	
Henderson Blvd	WB	1012	1479	1,371	1,881	1800	1800	2100	2100	2100	2100	0.56	0.82	0.65	0.90	0.65	0.90
Yelm Hwy SE																	
TMC Date: 06/25/15	NB	919	794	1,043	1,037	750	750	750	750	750	750	1.23	1.06	1.39	1.38	1.39	1.38
Peak Hour: 4:45 - 5:45		0	0	***	907	mc -			a		ma -			0	0	0	0.55
PHF: .91	SB	383	253	592	296	750	750	750	750	750	750	0.51	0.34	0.79	0.39	0.79	0.39
		3,160															
	EB	212	354	372	591	550	550	550	550	550	550	0.39	0.64	0.68	1.07	0.68	1.07
28																	
Rural Rd SW	WB	393	266	562	411	550	550	550	550	650	650	0.71	0.48	1.02	0.75	0.86	0.63
Trosper Rd SW																	
TMC Date: 05/25/45		0	0	0	0												
TMC Date: 06/25/15	NB	U	U	U	U	0	0	0	0	0	0						
Peak Hour: 4:30 - 5:30																	
PHF: .92	SB	149	134	313	245	550	550	550	550	550	550	0.27	0.24	0.57	0.45	0.57	0.45
		754															



Tumwater Transportation Master Plan

			Link Vo	olumes				Link Ca	apacity					Volume to C	apacity Ratio		
		Exis	ting	2040 Ba	aseline	Exis	ting	2040 B	aseline	2040 W	ith Imp	Exis	ting		aseline	2040 W	ith Imp
		APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART
Intersection	Movement	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK
	EB	306	444	480	630	550	550	550	550	650	650	0.56	0.81	0.87	1.15	0.74	0.97
	LD	300	444	400	030	330	330	330	330	030	030	0.30	0.01	0.07	1.13	0.74	0.57
29																	
Lake Park Dr	WB	472	347	758	645	1100	1100	1100	1100	1100	1100	0.43	0.32	0.69	0.59	0.69	0.59
Trosper Rd SW																	
The D	NB	143	114	177	141	450	450	450	450	450	450	0.32	0.25	0.39	0.31	0.39	0.31
TMC Date: 03/05/14	NB	143	114	1//	141	450	450	450	450	450	450	0.32	0.25	0.39	0.31	0.39	0.31
Peak Hour: 4:45 - 5:45																	
PHF: .98	SB	72	88	199	197	450	450	450	450	450	450	0.16	0.20	0.44	0.44	0.44	0.44
		993															
	EB	413	528	697	802	1100	1100	1100	1100	1100	1100	0.38	0.48	0.63	0.73	0.63	0.73
	FB	413	320	097	002	1100	1100	1100	1100	1100	1100	0.38	0.48	0.63	0.73	0.63	0.73
30																	
2nd Ave SW/Littlerock Rd SW	WB	697	760	815	1,072	1500	1500	1500	1500	1500	1500	0.46	0.51	0.54	0.71	0.54	0.71
Trosper Rd SW																	
TMC Date: 03/05/14	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
Peak Hour: 4:00 - 5:00																	
PHF: .98	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															
	EB	715	724	1,034	847	1500	1500	1500	1500	1500	1500	0.48	0.48	0.69	0.56	0.69	0.56
31																	
I-5 SB Ramps/Tyee Dr	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
Trosper Rd SW																	
TMC Date: 03/05/14	NB	518	590	625	734	550	550	550	550	550	550	0.94	1.07	1.14	1.33	1.14	1.33
Peak Hour: 4:30 - 5:30																	
PHF: .95	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															
		4.040	200	4.004													
	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
32																	
I-5 NB Ramps	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
Trosper Rd SW																	
TMC Date: 03/05/14	NB	251	524	145	665	1060	1060	550	550	550	550	0.24	0.49	0.26	1.21	0.26	1.21
Dark Haven 4:30 - 5:30																	
Peak Hour: 4:30 - 5:30 PHF: .93	SB	0	617	0	412	1060	1060	1060	1060	1060	1060	0.00	0.58	0.00	0.39	0.00	0.39
riii55	30	0	017	U	417	1000	1000	1000	1000	1000	1000	0.00	0.30	0.00	0.33	0.00	0.33
		2,796															



Tumwater Transportation Master Plan

			Link Vo	olumes				Link Ca	apacity					Volume to C	apacity Ratio		
			sting		aseline		sting	2040 B	aseline		ith Imp		ting	2040 E	Baseline	2040 W	Vith Imp
		APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART
Intersection	Movement	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK
	EB	908	1,189	1,121	1,589	2250	1500	1500	1500	1500	1500	0.40	0.79	0.75	1.06	0.75	1.06
33	11.00	132		350		450	450	450	450	450	450		0.46	0.00		0.00	0.05
Capitol Blvd SE Trosper Rd SW	WB	132	71	350	111	450	450	450	450	450	450	0.29	0.16	0.78	0.25	0.78	0.25
TMC Date: 03/05/14	NB	1,356	1,074	1,471	1,494	1800	1800	2100	2100	2100	2100	0.75	0.60	0.70	0.71	0.70	0.71
Deals Haves 4:20, 5:20																	
Peak Hour: 4:30 - 5:30 PHF: .99	SB	827	889	1,669	1,417	2100	2100	2100	2100	2100	2100	0.39	0.42	0.79	0.67	0.79	0.67
				,,,,,	,												
		3,223															
	EB	306	181	348	328	550	550	550	550	550	550	0.56	0.33	0.63	0.60	0.63	0.60
	EB	300	101	340	320	550	550	550	550	550	550	U.50	0.55	0.03	0.00	0.03	0.00
34																	
Capitol Blvd SE	WB	101	76	109	106	450	450	450	450	450	450	0.22	0.17	0.24	0.24	0.24	0.24
Lee St SW																	
TMC Date: 03/05/14	NB	1,069	869	1,378	1,374	1800	1800	2100	2100	2100	2100	0.59	0.48	0.66	0.65	0.66	0.65
Peak Hour: 4:30 - 5:30																	
PHF: .93	SB	1,017	1,367	1,456	1,483	1800	1800	2100	2100	2100	2100	0.57	0.76	0.69	0.71	0.69	0.71
		2,493															
	EB	0	3	0	3	450	450	450	450	450	450	0.00	0.01	0.00	0.01	0.00	0.01
35																	
Littlerock Rd SW	WB	246	198	279	213	450	450	450	450	450	450	0.55	0.44	0.62	0.47	0.62	0.47
Fred Meyer/Costco Drwy																	
TMC Date: 06/24/15	NB	747	713	1,149	1,102	1800	1800	1800	1800	1800	1800	0.42	0.40	0.64	0.61	0.64	0.61
TWC Date: 00/24/13	140		7.25	1,1-13	1,102	1000	1000	1000	1000	1000	1000	0.42	0.40	0.04	0.01	0.04	0.01
Peak Hour: 4:30 - 5:30																	
PHF: .96	SB	687	766	1,069	1,179	1800	1800	1800	1800	1800	1800	0.38	0.43	0.59	0.66	0.59	0.66
		1,680															
	EB	118	136	148	170	450	450	450	450	450	450	0.26	0.30	0.33	0.38	0.33	0.38
36																	
36 Littlerock Rd SW	WB	324	335	362	441	450	450	450	450	450	450	0.72	0.74	0.81	0.98	0.81	0.98
Costco Drwy																	
TMC Date: 06/24/15	NB	640	538	1,037	850	1800	1800	1800	1800	1800	1800	0.36	0.30	0.58	0.47	0.58	0.47
Peak Hour: 4:30 - 5:30																	
PHF: .95	SB	692	765	1,101	1,187	1800	1800	1800	1800	1800	1800	0.72	0.74	0.81	0.98	0.81	0.98
		1,774															



Tumwater Transportation Master Plan

ENGINEERING AND PLANNING SERVICES			Link Vo	olumes				Link C	apacity					Volume to C	Capacity Ratio		
			sting		aseline		sting	2040 B	aseline		ith Imp		ting	2040 E	Baseline	2040 V	Vith Imp
		APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART
Intersection	Movement	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK
	EB	0	0	0	0	0	0	0	0	0	0						
								-									
37																	
Littlerock Rd SW	WB	253	184	287	249	550	550	550	550	550	550	0.46	0.33	0.52	0.45	0.52	0.45
Kingswood Dr SW																	
TMC Date: 06/24/15	NB	621	697	1,008	977	1100	1100	1100	1100	1100	1100	0.56	0.63	0.92	0.89	0.92	0.89
				,													
Peak Hour: 4:30 - 5:30																	
PHF: .93	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															
		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
38																	
Capitol Blvd SE X St SE	WB	32	49	56	56	450	450	450	450	450	450	0.07	0.11	0.13	0.13	0.13	0.13
X St SE																	
TMC Date: 03/05/14	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
Peak Hour: 4:15 - 5:15																	
PHF: .89	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
39	WB	10	18	- 14	24	450	450	450	450	450	450	0.02	0.04	0.03	0.05	0.03	0.05
Elm St SE X St SE	WB	10	18	14	24	450	450	450	450	450	450	0.02	0.04	0.03	0.05	0.03	0.05
TMC Date: 06/25/15	NB	74	57	101	78	450	450	450	450	450	450	0.16	0.13	0.22	0.17	0.22	0.17
Peak Hour: 5:00 - 6:00 PHF: .74	SB	49	74	67	101	450	450	450	450	450	450	0.11	0.16	0.15	0.22	0.15	0.22
FDF/4	3D	47	/4	07	101	430	430	430	430	430	430	0.11	0.10	0.13	0.22	0.13	U.22
		160															
	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	WB	125	116	138	129	450	450	450	450	450	450	0.28	0.26	0.31	0.29	0.31	0.29
Dennis St SE/SW																	
TMC Date: 03/05/14	NB	723	632	935	1,076	1800	1800	2100	2100	2100	2100	0.40	0.35	0.45	0.51	0.45	0.51
Peak Hour: 4:30 - 5:15																	
PEAK HOUR: 4:30 - 5:15 PHF: .91	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															



Tumwater Transportation Master Plan

ENGINEERING AND PLANNING SERVICES			Link Vo	olumes				Link C	apacity					Volume to C	Capacity Ratio		
			sting		aseline		sting	2040 B	aseline		ith Imp		ting	2040 E	Baseline	2040 V	Vith Imp
		APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART
Intersection	Movement	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK
	EB	332	387	576	575	750	750	750	750	750	750	0.44	0.52	0.77	0.77	0.77	0.77
41 Capitol Blvd SE	WB	422	227	635	453	750	750	750	750	750	750	0.56	0.30	0.85	0.60	0.85	0.60
Israel Rd SE/SW	WB	422	227	033	400	730	730	730	730	730	730	0.30	0.30	0.05	0.00	0.03	0.00
TMC Date: 06/25/15	NB	448	729	689	1,242	1800	1800	1800	1800	1800	1800	0.25	0.41	0.38	0.69	0.38	0.69
Peak Hour: 4:30 - 5:30																	
PHF: .90	SB	673	532	1,119	748	1800	1800	2100	2100	2100	2100	0.37	0.30	0.53	0.36	0.53	0.36
		1,875															
	EB	128	143	182	275	450	450	450	450	450	450	0.28	0.32	0.40	0.61	0.40	0.61
42 Black Lake Belmore Rd SW	WB	197	148	343	229	450	450	450	450	450	450	0.44	0.33	0.76	0.51	0.76	0.51
66th Ave SW	****	137	140	37	223	430	430	430	450	450	430	0.44	0.55	0.70	0.51	0.70	0.51
TMC Date: 06/30/15	NB	0	0	0	0	0	0	0	0	0	0						
Peak Hour: 4:30 - 5:30																	
PHF: .95	SB	122	156	264	285	450	450	450	450	450	450	0.44	0.33	0.76	0.51	0.76	0.51
		447															
		447															
	EB	149	232	250	427	450	450	450	450	450	450	0.33	0.52	0.56	0.95	0.56	0.95
43 Kirsop Rd SW	WB	4	8	11	19	450	450	450	450	450	450	0.01	0.02	0.02	0.04	0.02	0.04
66th Ave SW																	
TMC Date: 05/20/45	NB	220	139	362	223	450	450	450	450	450	450	0.49	0.21	0.80	0.50	0.00	0.50
TMC Date: 06/30/15	NR	220	139	302	223	450	450	450	450	450	450	0.49	0.31	0.80	0.50	0.80	0.50
Peak Hour: 4:30 - 5:30																	
PHF: .84	SB	39	33	104	58	450	450	450	450	450	450	0.09	0.07	0.23	0.13	0.23	0.13
		412															
	EB	0	0	0	0	0	0	0	0	0	0						
44																	
Littlerock Rd SW	WB	20	11	30	17	450	450	450	450	450	450	0.04	0.02	0.07	0.04	0.07	0.04
Odegard Rd SW										_						_	
TMC Date: 06/24/15	NB	624	683	980	966	1100	1100	1100	1100	1100	1100	0.57	0.62	0.89	0.88	0.89	0.88
TWIC Date. 00/14/13	IND	024	- 003	300	300	1100	1100	1100	1100	1100	1100	0.37	0.02	0.03	0.00	0.03	0.00
Peak Hour: 4:30 - 5:30																	
PHF: .93	SB	676	626	955	983	1100	1100	1100	1100	1100	1100	0.61	0.57	0.87	0.89	0.87	0.89
		1,320															



Tumwater Transportation Master Plan

			Link Vo	olumes				Link C	apacity					Volume to C	apacity Ratio		
			sting		aseline		sting		aseline		ith Imp		sting		Saseline		/ith Imp
		APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART
Intersection	Movement	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK
	EB	255	502	351	681	450	450	450	450	450	450	0.57	1.12	0.78	1.51	0.78	1.51
45	11/0	460	242		***	250	200	200	250	200	250	0.04		4.00	0.50	4.00	0.50
Littlerock Rd SW Israel Rd SW/70th Ave SW	WB	460	242	771	440	750	750	750	750	750	750	0.61	0.32	1.03	0.59	1.03	0.59
,																	
TMC Date: 06/24/15	NB	527	531	778	830	1100	2000	1100	2000	1100	2000	0.48	0.27	0.71	0.42	0.71	0.42
Peak Hour: 4:30 - 5:30																	
PHF: .95	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															
	EB	235	418	594	807	750	750	750	750	750	750	0.31	0.56	0.79	1.08	0.79	1.08
	EB	233	410	334	807	/50	/50	/50	/50	/50	/50	0.31	0.50	0.79	1.08	0.79	1.08
46																	
Linderson Way SE/11th Ave SW	WB	420	314	625	530	750	750	750	750	750	750	0.56	0.42	0.83	0.71	0.83	0.71
Israel Rd SW																	
TMC Date: 06/24/15	NB	305	245	554	397	550	550	550	550	550	550	0.55	0.45	1.01	0.72	1.01	0.72
Peak Hour: 4:30 - 5:30																	
PHF: .83	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															
	EB	0	0	0	0	0	0	0	0	0	0						
47																	
Littlerock Rd SW	WB	502	411	774	625	900	900	900	900	900	900	0.56	0.46	0.86	0.69	0.86	0.69
Tumwater Blvd SW																	
TMC Date: 06/24/15	NB	239	507	504	879	750	750	750	750	900	900	0.32	0.68	0.67	1.17	0.56	0.98
TWIC Date: 00/24/15	IND	233	307	304	0/3	730	/30	/30	730	900	300	0.52	0.00	0.07	1.17	0.50	0.56
Peak Hour: 4:30 - 5:30																	
PHF: .94	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															
	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
48 I-5 SB Ramps	WB	594	747	880	1,099	900	1800	1800	1800	1800	1800	0.66	0.42	0.49	0.61	0.49	0.61
Tumwater Blvd SW		334		500	1,033	300	1000	1000	1000	1000	1000	0.00	0.42	5.45	0.01	5.45	0.01
TMC Date: 06/24/15	NB	0	422	0	723	1060	1060	1060	1060	1060	1060	0.00	0.40	0.00	0.68	0.00	0.68
Peak Hour: 4:30 - 5:30																	
PHF: .94	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															



Tumwater Transportation Master Plan

ENGINEERING AND PLANNING SERVICES			Lin <u>k</u> Vo	olumes				Link Ca	pacity					Volume to C	apacity Ratio		
			sting		aseline		sting	2040 B	aseline		ith Imp		sting	2040 E	aseline	2040 W	With Imp
		APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART
Intersection	Movement	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK
	EB	747	594	1,100	881	1800	900	1800	1800	1800	1800	0.42	0.66	0.61	0.49	0.61	0.49

49																	
I-5 NB Ramps	WB	1759	746	1,788	894	1800	1800	1800	1800	1800	1800	0.98	0.41	0.99	0.50	0.99	0.50
Tumwater Blvd SW																	
TMC Date: 06/24/15	NB	185	0	369	0	1060	1060	1060	1060	1060	1060	0.17	0.00	0.35	0.00	0.35	0.00
Peak Hour: 4:30 - 5:30																	
PHF: .88	SB	0	1,351	0	1,482	1060	1060	1060	1060	1060	1060	0.00	1.27	0.00	1.40	0.00	1.40
		2.001															
		2,691															
	EB	839	1,748	989	1,773	1800	1800	1800	1800	1800	1800	0.47	0.97	0.55	0.99	0.55	0.99
50																	
Linderson Way SE Tumwater Blvd SW	WB	789	782	969	940	1800	1800	1800	1800	1800	1800	0.44	0.43	0.54	0.52	0.54	0.52
Tumwater Bivd SW																	
TMC Date: 03/03/15	NB	295	371	384	611	550	550	550	550	550	550	0.54	0.67	0.70	1.11	0.70	1.11
Peak Hour: 4:30 - 5:30																	
PHF: .94	SB	1,228	250	1,239	257	550	550	550	550	550	550	2.23	0.45	2.25	0.47	2.25	0.47
		3,151															
		0,202															
	EB	819	801	987	987	1800	1800	1800	1800	1800	1800	0.46	0.45	0.55	0.55	0.55	0.55
51	1110	205	050	070	4.054	4000	4000	1000	4000	1000	4000		0.47	0.40	0.50	0.40	0.50
New Market St SW Tumwater Blvd SW	WB	735	850	870	1,054	1800	1800	1800	1800	1800	1800	0.41	0.47	0.48	0.59	0.48	0.59
Tallinates Situati																	
TMC Date: 03/03/15	NB	64	80	93	117	550	550	550	550	550	550	0.12	0.15	0.17	0.21	0.17	0.21
Peak Hour: 4:30 - 5:30 PHF: .92	SB	151	38	364	156	450	450	550	550	550	550	0.34	0.08	0.66	0.28	0.66	0.28
PRF: .92	38	151	58	304	150	450	450	550	550	550	550	U.34	0.08	U.00	0.28	U.00	0.28
		1,769															
	EB	613	630	819	765	1800	1800	1800	1800	1800	1800	0.34	0.35	0.46	0.43	0.46	0.43
52																	
52 Capitol Blvd SE	WB	423	435	478	517	1800	1800	1800	1800	1800	1800	0.24	0.24	0.27	0.29	0.27	0.29
Tumwater Blvd SE																	
TMC Date: 06/24/15	NB	521	802	758	1,389	900	900	1950	1950	1950	1950	0.58	0.89	0.39	0.71	0.39	0.71
Peak Hour: 4:30 - 5:30																	
PHF: .90	SB	693	383	1,324	708	1800	1800	1950	1950	1950	1950	0.39	0.21	0.68	0.36	0.68	0.36
				-,													



Tumwater Transportation Master Plan

			Lin <u>k V</u>	olumes				Lin <u>k C</u>	apacity					Volume to C	apacity Ratio		
			sting		aseline		sting	2040 B	aseline		ith Imp		ting	2040 E	aseline	2040 V	Vith Imp
		APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART
Intersection	Movement	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK
	EB	899	552	1,016	705	750	750	750	750	900	900	1.20	0.74	1.35	0.94	1.13	0.78
53 Wildflower St SE/65th Ave SE	WB	591	890	776	994	750	750	750	750	750	750	0.79	1.19	1.03	1.33	1.03	1.33
Henderson Blvd SE	WB	591	890	7/6	994	750	750	750	750	750	750	0.79	1.19	1.03	1.33	1.03	1.33
TMC Date: 07/01/15	NB	72	118	140	225	550	550	550	550	550	550	0.13	0.21	0.25	0.41	0.25	0.41
Peak Hour: 4:30 - 5:30																	
PHF: .91	SB	1	3	14	22	450	450	450	450	450	450	0.00	0.01	0.03	0.05	0.03	0.05
		1,563															
	EB	663	345	759	403	750	750	750	750	900	900	0.88	0.46	1.01	0.54	0.84	0.45
	EB	003	343	733	403	750	/50	/50	750	900	900	0.88	0.46	1.01	0.54	0.84	0.45
54																	
Tumwater Blvd SE	WB	0	0	0	0	0	0	0	0	0	0						
Henderson Blvd SE																	
TMC Date: 11/13/14	NB	187	209	206	303	750	750	750	750	900	900	0.25	0.28	0.27	0.40	0.23	0.34
														-			
Peak Hour: 4:30 - 5:30																	
PHF: .91	SB	520	816	673	932	750	750	750	750	900	900	0.69	1.09	0.90	1.24	0.75	1.04
		1,370															
	EB	240	192	311	287	750	750	750	750	900	900	0.32	0.26	0.41	0.38	0.35	0.32
55																	
Trails End Dr SE	WB	236	204	317	223	750	750	750	750	900	900	0.31	0.27	0.42	0.30	0.35	0.25
Henderson Blvd SE																	
TMC Date: 05/24/05	ND	105	185	133	251	450	450	450	450	450	450	0.22	0.41	0.20	0.50	0.20	0.50
TMC Date: 06/24/15	NB	105	185	133	251	450	450	450	450	450	450	0.23	0.41	0.30	0.56	0.30	0.56
Peak Hour: 5:00 - 6:00																	
PHF: .87	SB	0	0	0	0	0	0	0	0	0	0						
		581															
		301															
	EB	11	57	42	136	450	450	450	450	450	450	0.02	0.13	0.09	0.30	0.09	0.30
56 Littlerock Rd SW	WB	0	0	175	100	0	0	450	450	450	450			0.39	0.22	0.39	0.22
Black Hills High School Drwy	WB	U	U	1/5	100	U	U	450	450	450	45U			0.39	0.22	0.39	0.22
,																	
TMC Date: 06/24/15	NB	167	397	339	645	900	900	900	900	900	900	0.19	0.44	0.38	0.72	0.38	0.72
Peak Hour: 4:30 - 5:30																	
PHF: .96	SB	438	162	631	306	750	750	750	750	900	900	0.58	0.22	0.84	0.41	0.70	0.34
		616															



Tumwater Transportation Master Plan

			Link Vo	olumes				Link Ca	apacity					Volume to C	Capacity Ratio		
			sting		aseline		sting	2040 B	aseline		ith Imp		ting	2040 E	Baseline	2040 V	Vith Imp
		APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART
Intersection	Movement	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK
	EB	58	48	100	181	450	450	450	450	450	450	0.13	0.11	0.22	0.40	0.22	0.40
57																	
Center St SW 76th Ave SW	WB	38	19	60	30	450	450	450	450	450	450	0.08	0.04	0.13	0.07	0.13	0.07
TMC Date: 03/03/15	NB	248	320	303	439	550	550	550	550	550	550	0.45	0.58	0.55	0.80	0.55	0.80
Deals Haven Auff. 5:45																	
Peak Hour: 4:45 - 5:45 PHF: .92	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
	EB	23	13	40	30	450	450	450	450	450	450	0.06	0.04	0.10	0.07	0.10	0.07
58																	
Old Hwy 99	WB	199	222	297	295	750	750	750	750	750	750	0.27	0.30	0.40	0.39	0.40	0.39
Henderson Blvd SE																	
TMC Date: 06/23/15	NB	625	962	853	1,570	900	900	900	900	1950	1950	0.69	1.07	0.95	1.74	0.44	0.81
Peak Hour: 4:15 - 5:15																	
PHF: .87	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
59																	
Old Hwy 99	WB	122	147	154	153	450	450	450	450	450	450	0.27	0.33	0.34	0.34	0.34	0.34
79th Ave SE																	
TMC Date: 10/28/14	NB	448	862	668	1,489	900	900	900	900	1950	1950	0.50	0.96	0.74	1.65	0.34	0.76
TWC Date. 10/20/14	140				1,703	300	300	300	300	1930	1330	0.30	0.50	0.74	1.03	0.54	0.70
Peak Hour: 4:30 - 5:30																	
PHF: .95	SB	972	544	1,578	770	900	900	900	900	1950	1950	1.08	0.60	1.75	0.86	0.81	0.39
		1,554															
	EB	0	0	0	0	0	0	0	0	0	0						
60																	
Kimmie St SW	WB	60	19	70	17	450	450	450	450	450	450	0.13	0.04	0.16	0.04	0.16	0.04
83rd Ave SW																	
TMC Date: 03/03/15	NB	45	105	78	263	450	450	450	450	450	450	0.10	0.23	0.17	0.58	0.17	0.58
Peak Hour: 4:30 - 5:30																	
PHF: .82	SB	65	46	213	81	450	450	450	450	450	450	0.13	0.04	0.16	0.04	0.16	0.04
		170															



Tumwater Transportation Master Plan

			Link Vo	olumes				Link Ca	apacity					Volume to C	Capacity Ratio	,	
			sting		aseline		sting	2040 B			ith Imp		ting	2040 E	Baseline	2040 V	Vith Imp
		APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART
Intersection	Movement	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK
	EB	95	83	83	94	450	450	450	450	450	450	0.21	0.18	0.18	0.21	0.18	0.21
61 Center St SW	WB	100	181	150	289	450	450	450	450	450	450	0.22	0.40	0.33	0.64	0.33	0.64
83rd Ave SW	WB	100	101	150	203	430	430	430	430	430	430	0.22	0.40	0.33	0.04	0.55	0.04
TMC Date: 03/03/15	NB	0	0	0	0	0	0	0	0	0	0	0.21	0.18	0.18	0.21	0.18	0.21
Peak Hour: 4:45 - 5:45																	
PHF: .88	SB	228	159	356	206	450	450	450	450	450	450	0.51	0.35	0.79	0.46	0.79	0.46
		423															
	EB	211	183	270	520	750	750	750	750	750	750	0.28	0.24	0.36	0.69	0.36	0.69
62 Old Hwy 99	WB	7	7	7	7	450	450	450	450	450	450	0.02	0.02	0.02	0.02	0.02	0.02
88th Ave SE	WD		,	,	,	430	430	430	430	430	430	0.02	0.02	0.02	0.02	0.02	0.02
TMC Date: 06/23/15	NB	275	698	405	958	900	900	900	900	1050	1050	0.31	0.78	0.45	1.06	0.39	0.91
Peak Hour: 4:30 - 5:30																	
PHF: .90	SB	844	449	1,441	638	900	900	900	900	1950	1950	0.94	0.50	1.60	0.71	0.74	0.33
		1,337															
	EB	328	407	509	729	900	900	900	900	1800	1800	0.36	0.45	0.57	0.81	0.28	0.41
63	WB	267	705	200	887	000	000	900	000	4000	1000	0.30	0.88	0.42	0.00	0.22	0.49
I-5 SB Ramps 93rd Ave SW	WB	267	795	390	887	900	900	900	900	1800	1800	0.30	0.88	0.43	0.99	0.22	0.49
TMC Date: 06/23/15	NB	0	175	0	180	1060	1060	1060	1060	1060	1060	0.00	0.17	0.00	0.17	0.00	0.17
Peak Hour: 5:00 - 6:00																	
PHF: .88	SB	782	0	897	0	1060	1060	1060	1060	1060	1060	0.74	0.00	0.85	0.00	0.85	0.00
		1,377															
	EB	750	298	842	420	900	900	900	900	1800	1800	0.83	0.33	0.94	0.47	0.47	0.23
64	wo	590	617	747	706	900	900	900	900	1000	1800	0.66	0.69	0.00	0.78	0.40	0.39
I-5 NB Ramps 93rd Ave SW	WB	590	61/	717	/06	900	900	900	900	1800	1800	0.66	0.69	0.80	0.78	0.40	0.39
TMC Date: 06/23/15	NB	160	0	283	0	1060	1060	1060	1060	1060	1060	0.15	0.00	0.27	0.00	0.27	0.00
Peak Hour: 4:30 - 5:30																	
PHF: .94	SB	0	585	0	716	1060	1060	1060	1060	1060	1060	0.00	0.55	0.00	0.68	0.00	0.68
		1,500															



Tumwater Transportation Master Plan

ENGINEERING AND PLANNING SERVICES			Lin <u>k</u> Vo	olumes				Link Ca	apacity					Volume to C	Capacity Ratio		
			sting		aseline		sting	2040 B	aseline		ith Imp		ting		Baseline		Vith Imp
		APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART
Intersection	Movement	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK
	EB	502	471	591	598	900	900	900	900	1800	1800	0.56	0.52	0.66	0.66	0.33	0.33
65 Kimmie St SW	WB	417	477	489	573	900	900	900	900	1050	1050	0.46	0.53	0.54	0.64	0.47	0.55
93rd Ave SW	WD	417	477	463	3/3	900	900	900	900	1030	1030	0.40	0.33	0.54	0.04	0.47	0.55
TMC Date: 06/23/15	NB	26	22	24	21	450	450	450	450	450	450	0.06	0.05	0.05	0.05	0.05	0.05
Peak Hour: 4:15 - 5:15																	
PHF: .94	SB	57	32	155	67	450	450	450	450	450	450	0.13	0.07	0.34	0.15	0.34	0.15
		1,002															
	EB	485	378	580	442	900	900	900	900	1050	1050	0.54	0.42	0.64	0.49	0.55	0.42
66 Case Rd SW	WB	377	399	663	628	900	900	900	900	1050	1050	0.42	0.44	0.74	0.70	0.63	0.60
93rd Ave SW	WD	3//	399	003	020	900	900	900	900	1030	1030	0.42	0.44	0.74	0.70	0.03	0.00
TMC Date: 06/23/15	NB	133	269	171	462	750	750	750	750	750	750	0.18	0.36	0.23	0.62	0.23	0.62
Peak Hour: 4:30 - 5:30																	
PHF: .92	SB	100	49	224	106	450	450	450	450	450	450	0.42	0.44	0.74	0.70	0.63	0.60
		4 005															
		1,095															
	EB	395	368	623	654	900	900	900	900	1050	1050	0.44	0.41	0.69	0.73	0.59	0.62
67 Tilley Rd SW (south leg)	WB	322	303	750	473	750	750	750	750	750	750	0.43	0.40	1.00	0.63	1.00	0.63
93rd Ave SW	WB	322	303	730	473	730	730	730	730	730	730	0.43	0.40	1.00	0.03	1.00	0.03
TMC Date: 06/23/15	NB	197	243	256	502	900	900	900	900	900	900	0.22	0.27	0.28	0.56	0.28	0.56
Peak Hour: 4:30 - 5:30																	
PHF: .87	SB	0	0	0	0	0	0	0	0	0	0						
		914															
		314															
	EB	303	321	473	749	750	750	750	750	750	750	0.40	0.43	0.63	1.00	0.63	1.00
- C2																	
68 Tilley Rd SW (north leg)	WB	106	204	406	530	750	750	750	750	750	750	0.14	0.27	0.54	0.71	0.54	0.71
93rd AVE SW																	
TMC Date: 06/23/15	NB	0	0	5	3	0	0	0	0	0	0						
Peak Hour: 4:30 - 5:30																	
PHF: .86	SB	241	125	582	184	750	750	750	750	750	750	0.32	0.17	0.78	0.25	0.78	0.25
		650															
		030															



Tumwater Transportation Master Plan

			Link V	olumes				Link C	apacity					Volume to C	apacity Ratio		
		Exis	sting	2040 B	aseline	Exis	ting	2040 E	aseline	2040 W	ith Imp	Exis	ting	2040 B	aseline	2040 W	Vith Imp
		APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART
Intersection	Movement	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK
	EB	171	98	220	222	750	750	750	750	750	750	0.23	0.13	0.29	0.30	0.29	0.30
69																	
Old Hwy 99 SE	WB	0	0	0	0	0	0	0	0	0	0						ļ
93rd Ave SW																	
TMC Date: 06/23/15	NB	283	785	534	1,091	900	900	900	900	900	900	0.31	0.87	0.59	1.21	0.59	1.21
Peak Hour: 4:30 - 5:30																	
PHF: .92	SB	658	229	918	359	900	900	900	900	1050	1050	0.73	0.25	1.02	0.40	0.87	0.34
																	4

APPENDIX A-5CAPACITY 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	В											
Movement	EBU	EBL	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	_	_	0	0	_	_	0	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		10.4				10.8				13.7		
HCM LOS		В				В				В		
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		ر ت	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		Þ	В	В	В	В	В	В	В			
HCM 95th-tile O		0	0	0								

Synchro 9 Report 6/10/2016

Tumwater Transportation Master Plan SCJ Alliance

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	ω	ω	ω	
Mvmt Flow	0	49	103	22	
Number of Lanes	0	_	_	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		10.3			
HCMLOS		В			
Lane					

Tumwater Transportation Master Plan SCJ Alliance

Lanes, Volumes, Timings
2: Crosby Blvd & Mottman Rd

Existing 2015
PM Peak Hour

i e												
	,	Ļ	1	1	†	<i>></i>	۶	→	*	•	←	•
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	J.	₩			₽		J,	→	٦,	ĸ	÷	
Traffic Volume (vph)	175	250	25	5	30	65	40	350	165	120	630	425
Future Volume (vph)	175	250	25	5	30	65	40	350	165	120	630	425
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	0		0	200		0	100		0
Storage Lanes	_		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)		940			1116			645			417	
Travel Time (s)		21.4			25.4			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	Perm	NA	
Protected Phases		4			00			2			6	
Permitted Phases	4			8			2		2	6		
Detector Phase	4	4		00	œ		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	
Minimum Split (s)	20.5	20.5		20.5	20.5		20.5	20.5	20.5	20.5	20.5	
Total Split (s)	39.0	39.0		39.0	39.0		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%	
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	
Total Lost Time (s)	4.5	4.5			4.5		4.5	4.5	4.5	4.5	4.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-IVIAX	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	ed to phase	2:NBTL a	and 6:SBT	TL, Start o	of Yellow							
Natural Cycle: 50	:											
Control Type: Actuated-Coordinated	ordinated											

Splits and Phases: 2: Crosby Blvd & Mottman Rd

№ 2(R)	
61s	39 s
♦ *206 (R)	₹ 28
61s	39 s

Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

HCM 2010 Signalized Intersection Summary 2: Crosby Blvd & Mottman Rd

Existing 2015
PM Peak Hour

Movement Lane Configurations Traffic Volume (veh/h) Traffic Veh Traffic	EBT 1.00 1.00 1.00 1.00 1.00 1.00 0.0	25 25 25 26 110 100 100 100 100 100 100 100 100 10	WBL 5 5 5 5 5 6 7 1,000 1,000 1,000 1,000 6 6 6 6 6 7 1,000 1,000 5 6 7 1,000 5 6 7 1,000 5 7 1,	₩BI 1.00 30 30 30 30 30 30 30 30 30 30 30 30 3	WBR 65 65 118 0 1.00 1.00 0.1900 73 0 0.89 0 0.22 1089 0 0.02 1089 0 0.05 0 0.05 0 0.05 0 0.05 0 0.05 0 0.05 0 0.05 0 0 0.05 0 0.05 0 0 0 0	NBL	NBT 350 350 350 350 350 350 350 350 350 35	NBR 165 165 12 0 0 1.000	SBL 120	SBT ← 630 630	SBR 425 425 16
### ### 175 175 7 0 100 1845 1845 197 197 197 197 1269 90 13.5 100 13.5 100 35.7 1.3 1		25 25 25 27 27 11 10 10 10 10 10 10 10 10 10 10 10 10	WBL 5 5 5 7 1.00 1.00 1.00 1.00 0.89 0.89 0.44 0.22 29 29 113 11686 0.05 6.05 6.05 6.10 0.08 6.10 0.08 6.10 0.08 6.10 0.08 6.10 0.08 6.10 0.08 6.10 0.08 6.10 0.08 6.10 0.08 6.10 0.08 6.10 0.08 6.10 0.08 6.10 0.08 6.10 0.08 6.10 0.08 6.10 0.08 6.10 0.08 6.10 0.08 0.08 0.08 0.08 0.08 0.08 0.08 0	WBT 30 30 30 30 30 30 30 30 30 30 30 30 30	WBR 65 65 18 0 0 1.00 1.00 1.00 1.00 1.00 0.05 0.05	NBL 40 40 40 40 40 40 40 40 40 40 40 40 40	NBT → → → 350 350 350 100 100 100 11881 110 100 11881 1100 11881 1100 11881 1100 11881 1100 11881 1100 1	NBR 165 165 12 0 0 1.000	SBL 120 120 120 0	SBT 630	SB 42 42
775 1775 1775 1776 7 7 7 100 1.00 1.00 1.00 1.00 1.00 1.00		25 25 25 25 26 114 10 0 10 0 0 1900 0 28 28 28 28 28 28 28 28 3 3 3 3 3 3 9 9 11816	5 5 5 1,00 1,00 1,00 1,00 0 0 0 0 0 0 0 44 0.22 29 29 113 113 1686 0.05 6.15 1,00 5.6 6.15 1,00 6.0 6.0 6.0 6.0 6.0 6.0 6.0 6.0 6.0 6	30 30 30 30 30 1100 1100 1100 1100 1100	65 65 66 18 10 0 1.00 1.00 1900 73 73 0 0.89 0 0 0.89 0 0 0.89 0 0 0.89 0 0 0.00 0 0.65	40 40 40 40 40 40 40 1.00 1.00 1.00 1.00	350 350 350 350 350 370 100 100 100 100 100 100 100 100 100 1	165 165 165 12 0	120 120 1 1 0	630	42 42 1
175 175 7 0 0 100 1100 1100 1100 1100 11		25 25 26 11 10 0 11,00 11,00 1900 28 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	5 5 3 3 1 1 1 1 1 1 1 1 1 1 1 1 1	30 30 8 8 0 0 1,00 0 1,00 0 0 0 0 0 0 0 0 0 0 0 0	65 65 18 0 1.00 1.00 1.00 1.00 73 0 0.89 0 0.22 1089 0 0.02 1000 0.05 0.05 0.05 0.05 0.05 0.05 0.05	40, 40, 40, 40, 50, 10,00, 11,00, 11,00, 18,11, 45, 45, 11,00, 10,00,00, 10,00,	350 350 10 10 10 11881 1190 1089 1190 1190 119	165 165 12 0	120 120 0	630	42 42 1
175 7 0 1.00 1.00 1.00 1.00 1.00 1.00 1.00		25 11 10 10 10 10 10 10 10 10 10 10 10 10	5 1.00 1.00 1.00 6 0 0 0 0 0 0 0 0 0 0 0 0 0	30 8 8 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0	65 11.00 1.00 1.00 1.00 1.00 1.00 73 73 0.89 0.89 0.22 1.089 0.02 1.089 0.00 0.00 0.00 0.00 0.00 0.00 0.00	40 1.00 1.	350 2 2 0 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,	165 12 0	120 1 0	630	1 42
7 0 11.00 1845 197 197 1 1 0.89 3 357 3.57 1269 197 1269 9.0 13.5 10.0 357 0.55 519 11.0 35.7 1.3 5.7 1.3 0.5 5.7 1.3 0.5 5.7 1.3 0.5 1.0 0.5 1.0 0.5 1.0 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0		14 0 1100 1100 1100 1900 28 2 0 0 0 0 8 1 165 165 161 161 161 161 161 161 161 1	3 1.00 1.00 1900 6 6 0 0.89 0 0.22 29 1113 1686 0.05 640 5.6 640 5.6 640 5.6 640 640 640 640 640 640 640 640 640 64	8 0 11.00 1900 34 1 1.0 1.0 1.2 1.0 1.2 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0	18 0 11.00 1900 1900 1900 0.89 0 0.89 0 0.89 0 0.00 0 0.00 0 0.65 0 0.65 0 0.00 0 0.00 0 0.00	5 1.00 1.00 1.881 45 45 1 1 0.89 745 745 745 745 745 745 745 745 745 745	2 0 10 1881 1891 1908 1908 1908 1908 1908	1.00	0 -1	0 6	_
0 1100 1100 1100 1100 1197 1 0.89 3 357 0.22 1269 197 1269 9 0 13.5 1100 35.7 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.		0 1.00 1.00 1.00 1.00 1.00 28 28 0.08 9 3.3 3.3 3.3 3.9 1.16.1 1.6.1 1.6.1 1.6.1 1.6.1 1.6.1 1.6.1 1.6.2 6.26 6.26	1.00 1.00 1900 6 6 0 0 0.89 0 44 0.22 29 113 1686 0.05 6.15 6.15 6.15 6.15 6.15 6.28 6.15 6.00 6.32 6.00 6.00 6.00 6.00 6.00 6.00 6.00 6.0	0 1.00 1900 34 3 1 1 0.89 0 0 123 567 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1.00 1.00 1900 73 0 0.89 0 236 0.22 1089 0 0 0.00 0.65 0 0.00 0.00 0.00	0 1.00 1.00 1881 45 1 1 0.89 1 517 0.69 745 45 745 12.2 1.00 517 1.00 517 0.09 517 0.09 6.86 6.86 6.86 6.86 6.86 6.86 6.86 6.8	0 100 1881 1881 1 0 89 3 39 3 39 3 1 1 1304 0 6 1 1 1304 1 1304 1 1 1304 1 1 1304 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1.00	0	>	
1100 1100 11845 1197 1197 1 089 357 022 11269 1197 11269 1100 13.5 1100 13.5 1100 13.5 1100 1519 1100 1559 1100 1559 1100 157 1587 1137 1137 1137 1137 1137 1137 1137		1100 1100 1900 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1.00 1900 6 6 0 0 0.89 0 0 113 1686 0.05 29 29 1113 1088 60.05 56 0.05 50 0.05 29 29 29 29 29 29 29 29 20 50 60 60 60 60 60 60 60 60 60 60 60 60 60	1.00 1900 34 1 1 0 123 0.22 567 0 0 0.0 0 0 0 0 0 0 0 0 0 0 0 123 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1.00 1900 73 0.89 0.22 1089 0 0.00 0.05 0.05 0.05 0.05 0.05 0.05 0	1.00 1.80 1.81 45 45 1 0.89 0.45 745 745 745 12.2 1.00 517 0.09 517 0.09 6 8.0 0.3 0.0	1,00 1,881 1,933 393 1,089 1,1304 1,	1.00		c	
1.00 1845 197 197 0.89 3.35,7 0.22 1269 197 1269 9.0 9.0 13.5 11.00 13.5 11.00 35,7 0.55 519 11.00 10.00 10.		1100 11900 28 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	100 1900 6 0 0 0.89 0 113 1686 0.0 5.6 0.0 5.6 0.0 5.6 0.0 5.6 0.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1,00 1900 3,4 1 1 0,89 0 1123 0,22 567 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1.00 1900 73 0 0.89 0 236 0.22 1089 0 0 0 0 0.00 0.05 0 0 0.05 0 0 0 0 0 0	1.00 1881 45 0.89 0.69 745 745 745 745 745 745 745 745 745 745	100 1881 1304 1304 1304 1304 1304 1304 1304 130		1.00		1.00
1845 197 1 197 1 0.89 3 3 357 0.22 1269 197 1269 9.0 13.5 11.0 13.5 11.0 13.5 11.0 15.5 519 11.0 10.5 519 11.0 10.5 519 11.0 10.5 519 10.5 510 10.5 510 10.5 510 10.5 510 10.5 510 10.5 510 10.5 510 10.5 510 10.5 510 10.5 510 510 510 510 510 510 510 510 510 51		1900 28 0 0 0.89 0 0.22 1165 133 3 3 3 3 165 116.1 116.1 116.1 116.1 116.1 116.1 116.1 116.1 116.2 6.26 6.26	1900 6 0.89 0.89 0 44 44 0.22 29 1113 1686 0.05 6.15 6.15 6.15 6.15 6.15 6.15 6.15 6.1	1900 34 1 1 0.89 0 123 0.22 567 0 0 0.0 0 0.0 0 0 0 0 0 0 0	1900 73 0 0.89 0 236 0.22 1089 0 0 0 0.00 0.65 0 0.00 0 0.00 0 0.00 0 0.00	1881 45 1 1 0.89 1 517 0.69 745 45 745 2.6 2.6 12.2 1.00 517 0.09 517 0.09 517 0.09 517	1881 1393 11304 1089 11881 1393 1393 1881 1881 1881 1881 1	1.00	1.00	1.00	1.00
197 1 0.89 3 357 0.22 1269 197 1269 9.0 13.5 1.00 35.7 0.55 519 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.		28 0 0 0 0 8 3 3 3 3 3 3 3 3 3 3 6 0.22 165 1161 1161 1161 1161 1162 0.078 0.0	6 0 0 0 44 0 0.22 29 29 113 1686 0.05 6.15 6.15 1.00 5.6 0.05 0.05 0.05 0.05 0.05 0.05 0.	34 1 1 0.89 0 0 1123 0.22 567 0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	73 0.89 0.22 1089 0.00 0.00 0.065 0.00 0.00 0.00 0.00 0.0	45 1 0.89 1 517 0.69 745 45 745 12.2 1.00 517 1.00 517 1.00 0.09 0.09 0.03 0.03	393 1 1304 0.89 1 1304 0.69 1881 8.1 8.1 1304 0.30 1304 0.30 1304 0.00 0.96 5.9 0.00 4.4 4.4 6.5 8.7	1881	1845	1845	1900
1 0.89 357 0.22 1269 197 1269 9.0 13.5 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.		0 0.89 3 3 3 3 6 0.22 165 309 1816 16.1 16.1 16.1 16.1 16.1 16.1 16.1	0 0,89 0 44 44 0,22 29 113 1686 0,05 5,6 0,05 1,00 1,00 32,8 0,4 0,3 2,6 33,2 C	1 0.89 0 123 0.22 567 0 0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	0 0.89 0 236 0.22 1089 0 0 0.0 0.0 0.05 0 0.05 0 0.05 0 0 0.05 0 0 0.05 0 0 0.05 0 0 0 0	1 0.89 1 517 0.69 745 45 745 72.6 12.2 1.00 517 0.09 517 1.00 517 0.09 517 0.09 517	1 1304 0.69 1881 8.1 1304 0.30 1304	185	135	708	0
0.89 3 3.57 0.22 1269 197 1269 9.0 13.5 1.00 3.57 0.55 519 1.00 1.00 1.00 35.7 1.3 0.0 37.1 0		0.89 3 36 0.22 165 1816 16.1 16.1 16.1 16.1 16.1 16.1 16.1	0.89 0 44 0.22 29 113 1686 0.05 403 0.28 615 1.00 1.00 1.00 32.8 615 615 615 615 615 615 615 615	0.89 1123 0.22 567 0 0 0.0 0 0.0 0 0.0 0 0.0 0 0 0 0 0 0	0.89 0 236 0.22 1089 0 0 0 0 0 0 0 0 0 0.65 0 0 0 0.00	0.89 1 1 517 0.69 745 45 745 2.6 12.2 1.00 517 0.09 517 1.00 0.96 8.6 0.3 0.0 0.6 8.9	0.89 1304 0.69 1881 8.1 1304 0.30 1304 0.30 1304 0.30 0.96 5.99 0.6 6.94 4.4 6.62	_	_	2	
3 357 0.22 1269 197 1269 9 0 9 100 13.5 1.00 357 0.55 519 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.		3 36 0.22 165 309 1816 16.1 16.1 16.1 10.0 39.4 0.09 0.78 6.26 1.00 1.00 37.0 37.0 37.0 3.5 0.0 40.4 40.4 40.4	0 44 4 44 4 47 113 113 100 5.6 400 615 615 615 615 615 615 615 615 615 615	0 123 0.22 567 0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	236 0.222 1089 0 0 0 0 0 0.0 0.0 0.0 0.0 0.0 0 0.0 0 0.0 0 0.0 0 0.0 0 0.0 0 0.0 0 0.0 0 0.0 0 0.0 0 0.0 0 0.0 0 0.0 0 0.0 0 0.0 0 0.0 0 0.0 0 0.0 0 0.0 0 0.0 0 0.0 0 0 0 0.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1 517 0.69 745 45 45 745 2.6 12.2 1.00 517 0.09 517 1.00 0.96 8.6 0.3 0.0	1304 0.69 1881 1881 1881 8.1 1304 0.30 1304 1304 0.30 0.30 0.30 0.96 0.96 0.96 0.96 0.96	0.89	0.89	0.89	0.89
357 0.22 1269 197 1269 9.0 13.5 11.00 357 0.55 519 11.00 35.7 1.00 35.7 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.		36 0.22 165 309 1816 16.1 16.1 16.1 16.1 10.09 394 0.78 626 1.00 1.00 37.0 3.5 0.0 9		123 0.22 567 0 0 0.0 0.0 0.0 0.0 0.0 0.00 0.00 0.0	236 0.22 1089 0 0 0 0 0 0 0.0 0.65 0 0 0.05 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	517 0.69 745 45 745 745 745 72.6 12.2 1.00 517 0.09 517 1.00 0.96 8.6 0.3 0.0 0.6 8.9 A	1304 0.69 1881 393 1881 8.1 1304 0.30 1304 0.30 1304 0.30 1304 0.30 1304 0.30 1304 0.30 1304 0.30 1304 1.00 0.96 5.9 0.6 6.5 6.7 6.7 6.7 6.7 6.7 6.7 6.7 6.7	_	ω	ω	
0.22 1269 197 1269 9.0 13.5 100 35.7 519 100 100 1.00 1.00 35.7 519 1.00 1.00 35.7 519 1.00 1.00 35.7 519 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.		0.22 165 309 1816 16.1 16.1 16.1 0.09 394 626 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0	0.22 29 113 1686 0.05 403 0.28 0.28 1.00 1.00 1.00 0.4 0.4 0.5 6.7 6.7 6.7 6.7 6.7 6.7 6.7 6.7	0.22 567 0 0 0.0 0.0 0.0 0.0 0 0.0 0 0.0 0 0.0 0 0.0 0 0.0 0 0.0 0 0.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.22 1089 0 0 0.0 0.0 0.65 0 0.065 0 0.00 0.00 0.	0.69 745 45 745 745 2.6 12.2 1.00 517 0.09 517 1.00 0.96 8.6 0.3	0.69 1881 393 1881 8.1 1304 0.30 1304 0.30 1304 100 0.96 5.9 0.6 0.0 0.4 4.4 6.5 A	1108	561	2430	
1269 127 128 9.0 13.5 1.00 357 0.55 519 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.		165 309 1816 16.1 16.1 16.1 0.09 394 0.78 626 1.00 1.00 1.00 1.00 37.0 3.5 8.4 40.4	1113 11686 0.00 5.6 0.005 403 0.28 615 1.00 1.00 32.8 0.4 0.4 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6	567 0 0 0.0 0.0 0.0 0 0.0 0 0.0 0 0.0 0 0.0	1089 0 0 0.0 0.0 0.0 0.05 0 0.00 0.00 0.00	745 45 745 2.6 12.2 1.00 517 0.09 517 1.00 0.96 8.6 0.3	1881 393 1881 8.1 8.1 1304 0.30 1304 1.00 0.96 5.9 0.0 6.5 A A	0.69	0.69	0.69	0.00
197 1269 90 13.5 1.00 357 0.55 519 1.00 1.00 1.00 1.00 1.00 1.00 35.7 1.3 0.0 5.1 1.3		309 1816 16.1 16.1 10.09 394 0.78 626 1.00 1.00 3.5 0.0 8.4 40.4 D	113 1686 0.0 5.6 0.05 403 0.28 615 1.00 1.00 32.8 0.4 0.0 5.6 62 63 63 63 63 63 63 63 63 63 63 63 63 63	0 0.0 0.0 0.0 0.0 0 0.0 0 0.0 0.0	0 0 0.0 0.0 0.65 0 0.00 0 0.00 0 0.00	45 745 2.6 12.2 1.00 517 0.09 517 1.00 0.96 8.6 0.3 0.0	393 1881 8.1 8.1 1304 0.30 1304 1,00 0,96 5.9 0.6 0.0 4.4 4.4 6.5 A	1599	824	3597	
1269 9.0 13.5 1.00 357 0.55 519 1.00 1.00 1.00 1.00 1.00 1.00 1.00 35.7 1.3 0.0 37.1		1816 16.1 16.1 0.09 394 0.78 626 1.00 1.00 3.5 0.0 8.4 40.4	1686 0.0 5.6 0.05 403 0.28 615 1.00 1.00 32.8 0.4 0.0 5.6 635 635 645 645 645 645 645 645 645 645 645 64	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	0 0.0 0.0 0.65 0 0.00 0 0.00 0 0.00	745 2.6 12.2 1.00 517 0.09 517 1.00 0.96 8.6 0.3 0.0 0.6	1881 8.1 1304 0.30 1304 1.00 0.96 5.9 0.6 0.0 4.4 4.4 6.5 A	185	135	708	
9.0 13.5 1.00 0.55 519 1.00 1.00 1.00 1.00 1.35,7 1.3 h 0.57 1.3 h 0.57 1.3 h 0.57		16.1 16.1 0.09 394 0.78 626 1.00 1.00 37.0 3.5 0.0 8.4 40.4	0.0 5.6 0.05 403 0.28 615 1.00 1.00 32.8 0.4 0.0 2.6 33.2	0.0 0.0 0 0 0 0.00 0 0.00 0.00	0.0 0.0 0.65 0 0 0.00 0.00 0.00 0.00	2.6 12.2 1.00 517 0.09 517 1.00 0.96 8.6 0.3 0.0 0.6 8.9	8.1 1304 0.30 1304 1.00 0.96 5.9 0.6 0.0 4.4 4.4 6.5 A	1599	824	1752	
13.5 1.00 1.05 5.55 519 1.00 1.00 1.00 1.35,7 1.3 1.3 1.00 1.3 1.3 1.00 2.1 2.7 3.7,1 0.0		16.1 0.09 394 0.78 626 1.00 1.00 37.0 3.5 0.0 8.4 40.4	5.6 0.05 403 0.28 615 1.00 1.00 32.8 0.4 0.0 2.6 33.2	0.00 0.00 0.00 0.00 0.00	0.0 0.65 0 0.00 0.00 0.00 0.00 0.00	12.2 1.00 517 0.09 517 1.00 0.96 8.6 0.3 0.0 0.6 8.9	8.1 1304 0.30 1304 1.00 0.96 5.9 0.6 0.0 4.4 6.5 A	4.0	8.0	7.8	0.0
1.00 357 0.55 519 1.00 1.00 1.00 1.00 1.00 1.0 1.3 th 35.7 1.3 th 0.0 th/ln 5.1 D		394 0.78 626 1.00 1.00 37.0 3.5 0.0 8.4 40.4	0.05 403 0.28 615 1.00 1.00 32.8 0.4 0.0 2.6 33.2 C	0 0.00 0 1.00 0.00 0.00	0.65 0.00 0.00 1.00 0.00 0.00	1.00 517 0.09 517 1.00 0.96 8.6 0.3 0.0 0.6 8.9	1304 0.30 1304 1.00 0.96 5.9 0.6 0.0 4.4 6.5 A	4.0	17.9	7.8	0.0
10.55 519 519 1.00 1.00 1.00 1.0 1.0 1.0 1.0 1.0 1.0		394 0.78 626 1.00 1.00 3.7.0 3.5 0.0 8.4 40.4	0.28 615 1.00 1.00 32.8 0.4 0.0 2.6 33.2 C	0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00	517 0.09 517 1.00 0.96 8.6 0.3 0.0 0.6 8.9	1304 0.30 1304 1,00 0.96 5.9 0.6 0.0 4.4 4.4 6.5	1.00	1.00		0.00
0.55 519 1.00 1.00 1.00 sh 35.7 1.3 h 0.0 sh/ln 5.1 5.1		0.78 626 1.00 1.00 37.0 3.5 0.0 8.4 40.4	0.28 1.00 1.00 32.8 0.4 0.0 2.6 33.2	0.00 1.00 0.00 0.00	1.00 0.00 0.00 0.0	0.09 517 1.00 0.96 8.6 0.3 0.0 0.6 8.9	0.30 1304 1.00 0.96 5.9 0.6 0.0 4.4 6.5	801.1	56	2430	
1.00 1.00 1.00 1.00 1.0 1.3 1.3 1.4 1.3 1.4 1.3 1.7 1.3 1.7 1.3 1.7 1.3 1.7 1.3		1.00 1.00 37.0 3.5 0.0 8.4 40.4	1.00 1.00 32.8 0.4 0.0 2.6 33.2 C	1.00 0.00 0.0	1.00 0.00 0.0	1.00 0.96 8.6 0.3 0.0 0.6 8.9	1.00 0.96 5.9 0.6 0.0 4.4 6.5 A	1108	0.24	2/20	0.00
1.00 sh 35.7 1.3 h 0.0 sh/ln 5.1 37.1 D		1.00 37.0 3.5 0.0 8.4 40.4 D	1.00 32.8 0.4 0.0 2.6 33.2 C	0.00	0.00	0.96 8.6 0.3 0.0 0.6 8.9 A	0.96 5.9 0.6 0.0 4.4 6.5 A	1.00	1.00	1.00	1.00
sh 35.7 1.3 sh 0.0 sh/ln 5.1 37.1 D		37.0 3.5 0.0 8.4 40.4	32.8 0.4 0.0 2.6 33.2 C	0.0	0.0	8.6 0.3 0.0 0.6 8.9 A	5.9 0.6 0.0 4.4 6.5 A	0.96	1.00	1.00	0.00
1.3 th 0.0 th/ln 5.1 37.1 D		3.5 0.0 8.4 40.4 D	0.4 0.0 2.6 33.2 C	0.0	0.0	0.3 0.0 0.6 8.9	0.6 0.0 4.4 6.5 A	5.3	9.9	5.9	0.0
h 0.0 h/ln 5.1 37.1 D		0.0 8.4 40.4 D	0.0 2.6 33.2 C		0.0	0.0 0.6 8.9 A	0.0 4.4 6.5 A	0.3	1.0	0.3	0
sh/ln 5.1 37.1 D		8.4 40.4 D	33.2 C	0.0	0.0	0.6 8.9 A	4.4 6.5 A	0.0	0.0	0.0	0
37.1 D		40.4 D	33.2 C	0.0	,	8.9 A	6.5 A	1.8	2.0	3.8	
D	506	D	0	0.0	0.0	Þ	623	5.6	10.9	6.2	0
	506		_				623	Þ	В	Þ	0.0
			>	113						843	0.0
	39.1		>	33.2			6.4			7.0	0.0
	D		Λ	С			Þ			A	0 0
Timer 1	2	ယ	4	5	6	7	8				0.0
Assigned Phs	2		4		6		8				0.0
(G+Y+Rc), s	74.1		25.9		74.1		25.9				0.0
	4.5		4.5		4.5		4.5				0.0
	56.5		34.5		56.5		34.5				0.0
Max Q Clear Time (g_c+l1), s	14.2		18.1		19.9		7.7				
	12.7		3.0				1.0				0.0
Intersection Summary					12.2		3.4				0.0
HCM 2010 Ctrl Delay					12.2		3.4				
HCM 2010 LOS		16.0			12.2		3.4				

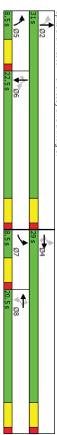
Tumwater Transportation Master Plan SCJ Alliance

Lanes, Volumes, Timings
3: Crosby Blvd & Irving St

Existing 2015
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		Ž,	-14		Ž,	-14	H	¥		JI.	→	
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		200	0		150	200		0	0		250
Storage Lanes	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)		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+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA		Perm	NA	Perm
Protected Phases	7	4			00		5	2			6	
Permitted Phases	4		4	00		00	2			6		
Detector Phase	7	4	4	00	00	00	5	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	4
Minimum Split (s)	8.5	20.5	20.5	20.5	20.5	20.5	8.5	20.5		20.5	20.5	20.5
Total Split (s)	8.5	29.0	29.0	20.5	20.5	20.5		31.0			22.5	22.5
Total Split (%)	14.2%	48.3%	48.3%	34.2%	34.2%	34.2%		51.7%			37.5%	37.59
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	<u></u>
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
Lead/Lag	Lead			Lag	Lag	Lag	Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes			Yes	Yes	Yes
Recall Mode	None	Max		Max	Max	Max						
Intersection Summary												
Area Type:	Other											
Cycle Length: 60												
Actuated Cycle Length: 51	7											

Splits and Phases: 3: Crosby Blvd & Irving St



Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

HCM 2010 Signalized Intersection Summary 3: Crosby Blvd & Irving St

Existing 2015
PM Peak Hour

Movement	EBL	EBT	EBR	WBL •	WBT	WBR	NBL -	NBT -	NBR	SBL	SBT	SBR
Lane Configurations		2 .,	-14		ž,	-14	Ji,	₽		Ħ	→	_
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	ω	œ	18	5	2	12	_	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1759	1759	1900	1881	1881	1881	1881	1900	1863	1863	1863
Adj Flow Rate, veh/h	84	22	17	185	39	28	28	326	17	180	478	
Adj No. of Lanes	0	_	_	0	_	_	_	_	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, %	œ	œ	00	_	_	_	_	_	_	2	2	
Cap, veh/h	137	20	387	370	61	414	416	980	51	598	807	686
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
Sat Flow, veh/h	1	77	1495	898	236	1599	1792	1772	92	1033	1863	1583
Grp Volume(v), veh/h	106	0	17	224	0	28	28	0	343	180	478	0
Grp Sat Flow(s),veh/h/ln	88	0	1495	1134	0	1599	1792	0	1865	1033	1863	1583
Q Serve(g_s), s	<u></u>	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	<u>ω</u> —	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	1.00		0.05	1.00		1.00
Lane Grp Cap(c), veh/h	0	0	387	431	0	414	416	0	1032	598	807	686
V/C Ratio(X)	0.00	0.00	0.04	0.52	0.00	0.07	0.07	0.00	0.33	0.30	0.59	0.00
Avail Cap(c_a), vervh	200	3 0	765	539	200	534	519	200	1032	598	100	686
HCM Platoon Ratio	1.00	1.00	1.00	3.6	1.00	3.0	1.00	1.00	1.00	1.00	3.0	1.00
Upstream Filter(i)	00.00	0.00	12.00	17.8	0.00	13.0	7 5	0.00	л С	٥ . ٥	10.3	0.00
Incr Delay (d2) s/yeh	0.0	000	000	10	0.0	01	0 1	0.0	0 0 0	<u>۔</u> د د	ر د د	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 BackOfQ(50%),veh/ln	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			В	В		В	Α		Α	В	В	
Approach Vol, veh/h		123			252			371			658	
Approach Delay, s/veh		1.8			18.2			6.8			12.7	
Approach LOS		Α			В			A			В	
Timer	_	2	ω	4	5	6	7	ω				
Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		31.0		16.9	5.7	25.3		16.9				
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s		26.5		24.5	4.0	18.0		16.0				
Max Q Clear Time (g_c+l1), s		6.8		5.1	2.4	11.4		11.7				
Green Ext Time (p_c), s		6.1		2.0	0.0	3.2		0.8				
Intersection Summary												
HCM 2010 Ctrl Delay			11.2									
HCM 2010 LOS			J									

Tumwater Transportation Master Plan SCJ Alliance

HCM 2010 AWSC 4: Irving St & 7th Ave

Existing 2015
PM Peak Hour

III I SECTION												
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	_
Future Vol, veh/h	0	5	10	165	0	_	20	_	0	175	5	_,
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	_	_	_	2	0	0	0	2	_	_	_,
Mvmt Flow	0	5	⇉	179	0	_	22	_	0	190	51	,
Number of Lanes	0	0	_	0	0	0	_	0	0	0	_	
Approach		8				WB				NB		
Opposing Approach		WB				ΕB				SB		
Opposing Lanes		_				_				_		
Conflicting Approach Left		SB				NB				EB		
Conflicting Lanes Left		_				_				_		
Conflicting Approach Right		NB				SB				WB		
Conflicting Lanes Right		_				_				_		
HCM Control Delay		8				7.7				9.1		
HCM LOS		Þ				Þ				Þ		
Lane		NBLn1	EBLn1	WBLn1	SBLn1							
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	ر ت	_	0							
Through Vol		5	10	20	5							
RT Vol		_	165	_	57							
Lane Flow Rate		197	196	24	=======================================							
Geometry Grp		_	_	_	_							
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	00	7.7	7.4							
HCM Lane LOS		A	A	Þ	Þ							
HCM 95th-tile Q		_,	08	0.1	0							

Tunnwater Transportation Master Plan
Synchro 9 Report
SCJ Alliance
6/10/2016

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	
Future Vol, veh/h	0	0		5	
Peak Hour Factor	0.92	0.92	0.92	0.92	
Heavy Vehicles, %	2	0	0	0	
Mvmt Flow	0	0	5	σı	
Number of Lanes	0	0	_	0	
Approach			SB		
Opposing Approach			NB		
Opposing Lanes			_		
Conflicting Approach Left			WB		
Conflicting Lanes Left			_		
Conflicting Approach Right			EB		
Conflicting Lanes Right			_		
HCM Control Delay			7.4		
HCMLOS			Þ		
Lane					

Tumwater Transportation Master Plan SCJ Alliance

HCM 2010 TWSC 5: Crosby Blvd & Barnes Rd

Existing 2015
PM Peak Hour

HCM 95th %tile Q(veh)	HCM Lane LOS	HCM Control Delay (s)	HCM Lane V/C Ratio	Capacity (veh/h)	Minor Lane/Major Mvmt	HCM LOS	HCM Control Delay, s	Approach	¢	Stage 2	Stage 1	Mov Cap-2 Maneuver	Mov Cap-1 Maneuver	Platoon blocked, %	Stage 2	Stage 1	Pot Cap-1 Maneuver	Follow-up Hdwy	Critical Hdwy Stg 2	Critical Hdwy Stg 1	Critical Hdwy	Stage 2	Stage 1	Conflicting Flow All	Major/Minor	Mvmt Flow	Heavy Vehicles, %	Peak Hour Factor	Grade, %	Veh in Median Storage, #	Storage Length	RT Channelized	Sign Control	Conflicting Peds, #/hr	Future Vol, veh/h	Traffic Vol, veh/h	Movement	Int Delay, s/yeh 6
0	Α	7.5	0.001	1427	NBL	C	22.4	EB		693	446	215	215		891	446	321	3.59	6.2	6.2	7.2	%	648	744	Minor2	⇉	10	91					Stop	0	10	10	EBL	<u>ن</u>
	Þ	0	,		NBT					799	376	275	275		800	454	333	4.09	5.6	5.6	6.6	96	648	744		_	10	91	0	0			Stop	0	_		EBT	
- 0.2	· ·	- 22.4	- 0.05	- 219	NBR EBLn1WBLn1WBLn2								896				896	3.39			6.3			132		0	10	91				None	Stop	0	0	0	EBR	
2 0.2	C C	4 18.4	5 0.058		1WBLn1	В	10.3	WB		378	913	287	287		458	914	332	3.518	6.12	6.12	7.12	649	93	742	Minor1	11	2	91		,			Stop	0	10	10	WBL	
	A	9.7	0.216	967	WBLn2								280		461			4.018					93			5	2	91	0	0			Stop		5	5	WBT	
0.6	Þ	7.9	0.172	1501	SBL							,	967		,		967	3.318			6.22	,	,	91		209	2	91	,		0	None	Stop	0	190	190	WBR	
					SBT SBR		0.1	NB					1427				1427	2.236			4.14			143	Major1	_	4	91					Free	0	_	_	NBL	
													,	,	į		,		ì		ï		,	0		88	4	91	0	0	,		Free	0	80	88	NBT	
													í		í				í		í		·	0		5	4	91		·		None	Free	0	57	57	NBR	
							5.1	SB					1501				1501	2.218			4.12			93	Major2	258	2	91			175		Free	0	235	235	SBL	
													,	,	,		,		,				1	0		121	2	91	0	0	,		Free	0	110	110	SBT	
																								0		22	2	91	,			None	Free	0	20	20	SBR	

Synchro 9 Report 6/10/2016

Tumwater Transportation Master Plan SCJ Alliance

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

Existing 2015
PM Peak Hour

Fire Free Free Slop None Free Slop None Anglor2 Minori Major2 Minori Major3 Minori Major4 Minori Major5 Minori Major5 Minori Major6 Minori Major6 Minori Major6 Minori Major7 Minori Major8 Min	HCM Lane LOS	HCM Control Delay (s)	HCM Lane V/C Ratio	Capacity (veh/h)	Minor Lane/Major Mvmt	Minor Lang/Major Mount	HCM LOS	HCM Control Delay, s	Apploacii	Approach	1 200	Stage 2	Stage 1	Mov Cap-2 Maneuver	Mov Cap-1 Maneuver	Platoon blocked, %	Stage 2	Stage 1	Pot Cap-1 Maneuver	Follow-up Hdwy	Critical Hdwy Stg 2	Critical Hdwy Stg 1	Critical Hdwy	Stage 2	Stage 1	Conflicting Flow All	Major/Minor	Mvmt Flow	Heavy Vehicles, %	Peak Hour Factor	Grade, %	Veh in Median Storage, #	Storage Length	RT Channelized	Sign Control	Conflicting Peds, #/hr	Future Vol, veh/h	Traffic Vol, veh/h	Movement	Int Delay, s/veh 11.9
Hebk WBL WBI NBL TO 130 305 100 TO 130 305 180 TO 0 0 0 0 0 Free Free Free Slop None - None - None - 250 - 0 0 94 94 94 94 3 0 0 0 1 74 138 324 191 74 138 324 191 A 1 0 541 - 1322 - 350 - 1322 - 310 - 1322 - 310 - 1322 - 492 - 1322 - 492 - 1322 - 492 - 1322 - 492 - 1322 - 492 - 1322 - 365 - 1322 - 365 - 1322 - 1322 - 10105 - EBR WBL WBT - 1322 - 1365 - 132 - 1322 - 10105 - EBR WBL WBT - 132 - 132 - 132 - 132 - 132 - 10105 - EBR WBL WBT - 132 - 132 - 132 - 133 - 132 - 133 - 132 - 134 - 132 - 134 - 132 - 134 - 132 - 134 - 132 - 134 - 132 - 134 - 13								C		EB																0	Major1	181	w	94	0	0			Free	0	170	170	EBT	9
MBL WBI NBL WBI WBI NBL WBI NBL NBL NBL NBL NBL NBL NBC NBC					EBK	EBD																																	EBR	
NBL 180 180 0 0 Stop 0 0 0 0 0 0 0 0 0 0 0 0 0 0 191 191 191	ω <i>P</i> (₩.			2.4	2 5	WB					1322		,		1322	2.2			4.1			255	Major2												WBL W	
																									•	0		24	0	94	0	0		ne	ee	0	05	05	81	
3. Q S							г	36.5	2 2	NB	1/2	492	821	310	310		549	821	346	3.509	5.41	5.41	6.41	601	218	819	Minor1	191	_	94	0	0	0		Stop	0	180	180	NBL	
1005 1005 1006 100 100 100 100 1112 1112 1112 111														,	824				824	3.309			6.21			218		112	_	94				None	Stop	0	105	105	NBR	

Tumwater Transportation Master Plan SCJ Alliance

HCM 2010 TWSC 7: RW Johnson Rd & Sapp Rd

Existing 2015
PM Peak Hour

Minor Lane/Major Mvmt Capacity (veh/h) HCM Lane V/C Ratio HCM Control Delay (s) HCM Lane LOS HCM 95th %tile Q(veh)	Approach HCM Control Delay, s HCM LOS	Platoon blocked, % Mov Cap-1 Maneuver Mov Cap-2 Maneuver Stage 1 Stage 2	Critical Hdwy Stg 2 Follow-up Hdwy Pot Cap-1 Maneuver Stage 1 Stage 2	Major/Minor Conflicting Flow All Stage 1 Stage 2 Critical Hdwy Critical Hdwy Stg 1	Storage Length Veh in Median Storage, # Grade, % Peak Hour Factor Heavy Vehicles, % Mvmt Flow	Intersection Int Delay, s/veh Movement Traffic Vol, veh/h Future Vol, veh/h Conflicting Peds, #/hr Sign Control RT Channelized
NBLn1 973 0.007 8.7 A 0	3.1	1457 - -	2.227 1457	Major1 124 - - 4.13	85 1	5.2 EBL 15 15 16 Free
EBL 1457 0.012 7.5 A				0	0 0 85 3 24	EBT 20 20 0 Free -
EBT A				0	<u>-</u> 3 85	EBR 1 1 0 Free None
EBR				2		
WBL 1596 0.004 7.3 A	0.3	1596	2.209 1596	Major2 25 - - 4.11	6 1 85	WBL 5 5 Free
WBT - 0 A A				0	85 0 0 ·	WBT 35 35 6 Free
WBR SBLn1 - 827 - 0.171 - 10.2 - 10.6				0	82 1 85	WBR 70 70 70 0 0 Free None
	NB 8.7 A	750 750 946 853	6.1 3.5 793 958 895	Minor1 174 59 115 7.1 6.1	0 0 0	NBL 0 0 Stop
		693 693 839 786	5.5 4 705 850 789	194 59 135 6.5	1 0 0 .	NBT 1 1 Stop
		1058	3.3	24	6 0 85	NBR 5 5 0 Stop
	SB 10.2 B	791 791 898 926		Minor2 157 94 63 7.13 6.13	85 3	SBL 85 85 Stop Stop
		724 724 812 832	5.53 4.027 736 815 843	154 94 60 6.53 5.53	6 3 5 0 .	SBT 5 5 Stop
		975	3.327 975	82	35 3 85	SBR 30 30 Stop None

Synchro 9 Report 6/10/2016

Tumwater Transportation Master Plan SCJ Alliance

HCM 2010 TWSC 8: Sapp Rd & Crosby Blvd

Existing 2015
PM Peak Hour

nt Delay, S/ven 5.	Ö					
ovement	WBL	WBR	NBT	NBR	SBL	SBT
raffic Vol, veh/h	60	15	130	70		110
uture Vol, veh/h	60	15	130	70		110
onflicting Peds, #/hr	0	0	0	0		0
ign Control	Stop	Stop	Free	Free	Stop	Stop
T Channelized		None		None		None
torage Length	250	0				
eh in Median Storage, #	0		0			0
Grade, %	0		0			0
Peak Hour Factor	91	91	91	91		91
Heavy Vehicles, %	_	_	_	_		0
/wmt Flow	66	16	143	77		121
/lajor/Minor	Minor1		Major1		Minor2	
Conflicting Flow All	241	181	0	0	181	220
Stage 1	181				0	0
Stage 2	60				181	220
ritical Hdwy	7.11	6.21			7.1	6.5
Critical Hdwy Stg 1	6.11					
ritical Hdwy Stg 2					6.1	5.5
ollow-up Hdwy	3.509	3.309			3.5	4
ot Cap-1 Maneuver	715	864			785	682
Stage 1	823					
Stage 2					825	725
Platoon blocked, %						
Nov Cap-1 Maneuver	618	864			770	682
Mov Cap-2 Maneuver	618				770	682
Stage 1	823					
Stage 2					809	725
hpproach	WB		NB		SB	
ICM Control Delay, s	11		0		11.2	
HCM LOS	В				В	
linor Lane/Major Mvmt	NBT	NBRWBLn1WBLn2 SBLn1 SBLn2	2 SBLn1 SBLn2			
	,	- 618 864	770			
apacity (veh/h)		0.107 0	0.029 (
apacity (veh/h) CM Lane V/C Ratio		- 11.5 9.	9.8			
apacity (veh/h) ICM Lane V/C Ratio ICM Control Delay (s)			>			
Capacity (vetvh) HCM Lane V/C Ratio HCM Control Delay (s) HCM Lane LOS		В	1			

Tumwater Transportation Master Plan SCJ Alliance

SimTraffic Performance Report

Existing 2015
PM Peak Hour

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

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

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

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

SimTraffic Report 2/8/2016

Tumwater Transportation Master Plan SCJ Alliance

Lanes, Volumes, Timings
10: Capitol Blvd & Sunset Way & Carlyon Ave

Existing 2015
PM Peak Hour

Natural Cycle: 95 Control Type: Act	Actuated	Area Type:	Intersecti	Recall M	Lead-Lag	Lead/Lag	Total Los	Lost Time	All-Red Time (s)	Yellow Time (s)	Total Spl	Total Split (s)	Minimum	Minimum	Switch Phase	Detector Phase	Permitted Phases	Protected	Turn Type	Shared L	Heavy Ve	Peak Hor	Travel Time (s)	Link Dista	Link Spe	Right Tur	Taper Length (ft)	Storage Lanes	Storage I	Ideal Flov	Future Vi	Traffic Vo	Lane Cor	Lane Group	
ycle: 95 ype: Actu	ctuated Cycle Length: 62.3	e.	tersection Summar	ode	_ead-Lag Optimize?	_	otal Lost Time (s)	ost Time Adjust (s)	īme (s)	me (s)	it (%)	it (s)	finimum Split (s)	finimum Initial (s)	hase	Phase	l Phases	rotected Phases	Ф	hared Lane Traffic	leavy Vehides (%	eak Hour Factor	me (s)	ink Distance (ft)	ink Speed (mph)	Right Turn on Red	ngth (ft)	_anes	Storage Length (ft)	deal Flow (vphpl)	uture Volume (vph)	raffic Volume (vph)	ane Configurations	quo	
ıated-Un	ngth: 62		lary		.53			s)												rc (%)	٣										Þ	ਣ	S		
Natural Cycle: 95 Control Type: Actuated-Uncoordinated	w	Other		None					1.0	3.5	31.1%	29.5	29.5	6.0		00		8	Prot		0%	0.85								1900	_	_		WBL2	4
				None			4.5	0.0	1.0	3.5	31.1%	29.5	29.5	6.0		00		8	Prot		0%	0.85	19.1	840	30		25	_	0	1900	55	55	54	WBL	ሽ
																					0%	0.85				Yes		0	0	1900	40	40		WBR	r*
				None			4.5	0.0	1.0	3.5	22.6%	21.5	21.5	6.0		4		4	Prot		0%	0.85	14.3	629	30		25	_	0	1900	35	35	-<	NBL	>
																					0%	0.85						0	0	1900	15	15		NBR	- 4
																					0%	0.85				Yes				1900	2	2		NBR2	*
				Max	Yes	Lag	4.5	0.0	1.0	3.5	32.1%	30.5	29.5	10.0		2		2	NA		2%	0.85	16.6	731	30					1900	440	440	ᢌ	NET	×
																					2%	0.85						0	0	1900	90	90		NER	\
																					2%	0.85				Yes				1900	15	15		NER2	4
				None	Yes	Lead			1.0	3.5	14.2%	13.5	10.5	6.0		_		_	Prot		1%	0.85								1900	45	45		SWL2	•
				None	Yes	Lead	4.5	0.0	1.0	3.5	14.2%	13.5	10.5	6.0		_		_	Prot		1%	0.85					25	_	150	1900	10	10	tu e	SWL	*
				Max			4.5	0.0	1.0	ω .5	46.3%	44.0	20.0	10.0		6		6	NA		1%	0.85	18.0	791	30					1900	815	815	‡	SWT	×

Tumwater Transportation Master Plan SCJ Alliance

Splits and Phases: 10: Capitol Blvd & Sunset Way & Carlyon Ave

3

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

Existing 2015 PM Peak Hour

		ŀ				l				l		l
	1	ሽ	P	>	-	•	×	*	4	€	1	×
Movement	WBL2	WBL	WBR	NBL	NBR	NBR2	NET	NER	NER2	SWL2	SWL	SW
Lane Configurations		34		≺			→				to/	÷
Traffic Volume (vph)	_	55	40	35	15	2	440	90	15	45	10	815
Future Volume (vph)	_	55	40	35	15	2	440	90	15	45	10	82
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
Frt		0.94		0.96			0.97				1.00	1.00
Flt Protected		0.97		0.97			1.00				0.95	1.00
Satd. Flow (prot)		1742		1757			3437				1787	3574
Flt 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)	_	65	47	41	18	2	518	106	18	53	12	959
RTOR Reduction (vph)	0	104	0	58	0	0	_	0	0	0	0	_
Lane Group Flow (vph)	0	9	0	ω	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			K			Prot	Prot	Z
Protected Phases	œ	œ		4			2			_	_	~
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 Grp 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	5.7
Level of Service		С		C			Þ				С	⊳
Approach Delay (s)		28.8		30.4			9.6					7.3
Approach LOS		С		С			Þ					_
Intersection Summary												
HCM 2000 Control Delay			10.2	H	XM 2000	HCM 2000 Level of Service	ervice		В			
HCM 2000 Volume to Capacity ratio	/ ratio		0.38									
Actuated Cycle Length (s)			67.1	Su	m of lost	time (s)			18.0			
Intersection Capacity Utilization	ם		46.1%	$\overline{\Box}$	ICU Level of Service	f Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 2/9/2016

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

Existing 2015
PM Peak Hour

Int Delay, s/veh						
Novement	SEL	SET	TWN	NWR	SWL	SWR
raffic Vol, veh/h	160	305	225	145	0	0
uture 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
T Channelized		None		None		None
Storage Length					0	
/eh in Median Storage, #		0	0		0	
Grade, %		0	0		0	
Peak Hour Factor	79	79	79	79	79	79
Heavy Vehicles, %	0	0	_	_	0	0
/wmt Flow	203	386	285	184	0	0
//ajor/Minor	Major1		Major2		Minor2	
Conflicting Flow All	468	0		0	1168	377
Stage 1					377	
Stage 2					791	
Critical Hdwy	4.1				6.4	6.2
Critical Hdwy Stg 1					5.4	
itical Hdwy Stg 2					5.4	
ollow-up Hdwy	2.2				3.5	3.3
Pot Cap-1 Maneuver	1104	,			216	674
Stage 1					698	
Stage 2					450	
Platoon blocked, %						
Mov Cap-1 Maneuver	1104				165	674
Vlov Cap-2 Maneuver					165	
Stage 1					698	
Stage 2	ļ,				345	
\pproach	SE		WN		WS	
HCM Control Delay, s	3.1		0		0	
HCM LOS					A	
finor Lane/Major Mvmt	TWN	NWR SEL	SETSWLn1			
		0 102				
MI and V/C Datio		- 0.183	o ,			
CM Control Delay (s)		۰				
HCM Lane V/C Ratio HCM Control Delay (s)		. 9				

Tumwater Transportation Master Plan SCJ Alliance

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

DME	Existin
Deak Hour	g 2015

	•					
Int Delay, s/veh 3./						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, velvh	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			С	0	
Grade, %	0			0	0	
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	_	_	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	,				i
Stage 2	1353					
Critical Hdwy	6.4		4.11			
Critical Hdwy Stg 1	5.4					
Critical Hdwy Stg 2	5.4					
Follow-up Hdwy	3.5		2.209			
Pot 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	,				i
Stage 2	153					
Approach	EB		NB		SB	
HCM Control Delay, s	0		5		0	
HCM LOS	Α					
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	⊳					

Synchro 9 Report 6/10/2016

Tumwater Transportation Master Plan SCJ Alliance

SimTraffic Performance Report

Existing 2015
PM Peak Hour

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

Movement (c)	EBR	NBL	NBT	SBT	SBR	All 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

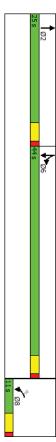
Tumwater Transportation Master Plan
SCJ Alliance
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Lanes, Volumes, Timings 14: 2nd Ave & Custer Way

Existing 2015
PM Peak Hour

	4	~	→	*	•	←	
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	
Lane Configurations	_#	٦,	ಶ್		H	→	
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		
Storage Lanes	_	_		0	_		
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	
Protected Phases	00		2		6	6	
Permitted Phases		00					
Detector Phase	00	00	2		6	6	
Switch Phase							
Minimum Initial (s)	4.0	4.0	4.0		4.0	4.0	
Minimum Split (s)	10.0	10.0	24.5		20.0	20.0	
Total Split (s)	11.0		25.0			44.0	
Total Split (%)	13.8%		31.3%			55.0%	
Yellow Time (s)	3.5		3.5		3.5	3.5	
All-Red Time (s)	1.0		1.0			1.0	
Lost Time Adjust (s)	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	pordinated						
Control Type: Actuated-Uncoordinated	oordinated						

Splits and Phases: 14: 2nd Ave & Custer Way



Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

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

Existing 2015
PM Peak Hour

Tumwater Transportation Master Plan SCJ Alliance

HCM 2010 TWSC 15: Boston St & Custer Way

Existing 2015
PM Peak Hour

Intersection												
Int Delay, s/veh 4.9	9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	710	165	370	260	5	0		150	0	_	UT.
Future Vol, ven/h	0	01/	165	3/0	260		0	· _	061	0	-	o G
Conflicting Peds, #/nr	F 0	T 0		Eroo O	п О	F 0	cton O	ct C	0	c c		2
orgin control	- 1	- 100	No so	1100	- 100	None of	Siop	Ciclo	200	Ciop	Ciop	0100
KI Channelized			None			None			None			None
Storage Length		,		425	,		l.				,	
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
Mvmt Flow	0	747	174	389	274	5	0	_	158	0	_	57
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	1 .			1 ,			l.	1058		374	921	
Critical Hdwy	4.115			4.115		·		6.5	6.9	7.3	6.5	6.2
Critical Hdwy Stg 1								1 5.5		6.1	1 5	
Follow-in Howy	2 2005			2 2095				0.0	بر ب ر	ر م م	0.0	ىر ، ىر
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		١.	١.		١.			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	3Ln1					
Capacity (veh/h)	502	1289		- 744			151					
HCM Lane V/C Ratio	0.317			- 0.523		- 0	0.042					
HCM Control Delay (s)	15.5	0		- 15			29.9					
HCM Lane LOS	C	⊳		C			D					
HCM 95th %tile Q(veh)	ا ن	0					0.1					

Tunwaler Transportation Master Plan
Synchro 9 Report
SCJ Alliance
6/10/2016

HCM 2010 AWSC 16: Deschutes Way & Boston St

Existing 2015
PM Peak Hour

Illici section	3									
Intersection Delay, siven	o 24									
Illelsection EO3	_									
Movement	WBU	WBL		WBR	NBU	NBT	NBR	SBU	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		0.93	0.92	0.93	0.93	0.92	0.93	0.93
Heavy Vehicles, %	2	_		_	2	0	0	2	0	0
Mvmt Flow	0	102		446	0	392	65	0	108	199
Number of Lanes	0	_		0	0	_	0	0	0	_
Approach		WB				NB			SB	
Opposing Approach						SB			NB	
Opposing Lanes		0				_			_	
Conflicting Approach Left		NB							WB	
Conflicting Lanes Left		3 _							_	
Conflicting Approach Right		SB				c				
Conflicting Lanes Right						WB				
TCM Control Delay		36				WB U			0	
Lane	-					0 WB 1 D			0 17.8 C	
/ol Left, %		JBLn1 ∖	WBLn1	SBLn1		0 WB 1 28 D			0 17.8 C	
Vol Thru, %		JBLn1 V	WBLn1	SBLn1		WB 1 28 D			0 17.8 C	
Vol Right, %		0% 86%	WBLn1 19%	SBLn1 35%		WB 1 28 D			0 17.8 C	
Sign Control		0% 86% 14%	WBLn1 19% 0% 81%	SBLn1 35% 65%		0 WB 28 1 D D			0 17.8 C	
TVol		0% 86% 14% Stop	WBLn1 19% 0% 81% Stop 510	SBLn1 35% 65% 0% Stop 285		0 1 1 D			0 17.8 C	
The 200 and 1/21		0% 86% 14% Stop 425	WBLn1 19% 0% 81% Stop 510 95	SBLn1 35% 65% 0% Stop 285		0 WB 1 D			0 17.8 C	
I lough voi		0% 86% 14% Stop 425 0	WBLn1 19% 0% 81% Stop 510 95	SBLn1 35% 65% 0% Stop 285 100		0 WB 1 D			17.8 C	
RT Vol		0% 86% 14% Stop 425 0 365 60	WBLn1 19% 0% 81% Stop 510 95	SBLn1 35% 65% 0% Stop 285 100 185		0 WB 1 D			17.8 C	
ane Flow Rate		0% 86% 114% Stop 425 0 365 60 457	WBLn1 19% 0% 81% Stop 510 95 415 548	SBLn1 35% 65% 0% Stop 285 100 185 0 336		0 WB 1 28 D			0 17.8 C	
RT Vol -ane Flow Rate Geometry Grp		0% 86% 114% Stop 425 0 365 60 457	WBLn1 19% 0% 81% Stop 510 95 415 548	SBLn1 35% 65% 0% Stop 285 100 185 0 306		0 WB 1 D			0 17.8 C	
TI lough voi AT Vol _ane Flow Rate Geometry Grp Degree of Util (X)		UBLn1 V 0% 86% 114% Stop 425 0 0 365 60 457 1 1	WBLn1 19% 0% 81% Stop 510 95 415 548 1	SBLn1 35% 65% 0% Stop 285 100 185 0 0 306		0 28 D			0 17.8 C	
Through voi		0% 86% 114% Stop 425 0 0 365 60 457 1 1 0.783 6.167	WBLn1 19% 0% 81% Stop 510 95 00 415 548 1 0.875	SBLn1 35% 65% 0% Stop 285 100 185 0 306 1 0 306 1 0 306		WB WB 1 28 D			0 17.8 C	
TITIOUGH VOI TITIOUGH VOI Lane Flow Rate Geometry Grp Departure Headway (Hd) Convergence, Y/N		0% 86% 14% Stop 425 0 0 365 60 457 1 1 0.783 6.167 Yes	WBLn1 19% 0% 81% Slop 510 95 415 548 1 0.875 5.742 Yes	SBLn1 35% 65% 65% 100 185 185 185 185 185 185 185 185 185 185		0 WB 1 D			17.8 C	
AT Vol AT Vol AT Vol ane Flow Rate Geometry Grp Degree of Util (X) Departure Headway (Hd) Convergence, Y/N Cap		0% 86% 114% Stop 425 0 0 0 365 60 457 1 1 0.783 6.167 Yes 585	WBLn1 19% 0% 81% Stop 510 95 415 548 1 0.875 5.742 Yes 631	SBLn1 35% 65% 0% Slop 285 100 185 0 185 0 0 306 17 0.561 6.587 Yes 545		0 0 28 D			17.8 C	
AT Vol VII VII VII VII VII VII VII VII VII VI		0% 86% 14% Stop 425 0 0 0 365 60 457 1 1 0.783 6.167 Yes 585 585	WBLn1 19% 0% 81% Stop 510 95 0 415 548 1 0.875 5.742 5.742 631	SBLn1 35% 65% 0% Stop 285 100 186 0 0 0 186 0 0 186 0 0 186 0 0 186 0 0 186 0 1 0 306 0 1 0 306 1 0 306 4 6 5 87 Yes 5 46 62		0 28 D			17.8 C	
I I I I I I I I I I I I I I I I I I I		0% 86% 114% Stop 425 0 0 365 60 457 1 1 0.783 6.167 Yes 585 585	WBLn1 19% 0% 81% Stop 510 95 0 415 548 1 0.875 5.742 0.875 6.782 0.868	SBLn1 35% 65% 70% 285 100 185 185 185 185 185 185 185 185 185 185		0 WB 1 D			17.8 C	
Intrody voi RT Voi Lane Flow Rate Geometry Grp Degree of Util (X) Departure Headway (Hd) Convergence, YIN Cap Service Time HCM Lane VIC Ratio HCM Control Delay		0% 86% 114% Stop 425 0 0 365 60 457 1 1 0.783 6.167 Yes 586 586 4.216 0.781	WBLn1 19% 0% 81% Stop 510 95 415 445 548 110 0875 5548 110 0875 5548 1338	SBLn1 35% 65% 0% Slop 285 100 185 100 185 100 561 1 0.561 1 0.561 4 6.587 Yes 545 4 6.545 4 6.545 4 6.545 6 6 7 8 8		0 0 1 1 0			17.8 o	
Initiduji voi RT Voi Lane Flow Rate Geometry Grp Degree of Util (X) Departure Headway (Hd) Convergence, YIN Cap Service Time HCM Lane V/C Ratio HCM Lane L/CS HCM Lane L/CS HCM Lane L/CS		0% 86% 114% Stop 425 0 0 365 60 60 457 1 0.783 6.167 Yes 585 4.216 0.781	WBLn1 19% 0% 81% Slop 510 95 548 415 548 7 1 0.868 631 3.782 0.868 E	SBLn1 35% 65% 65% 70% Slop 285 100 0 185 100 0 0 306 6.587 Yes 545 4.642 0.561 17.86		D 28 N			17.8 C	

Tumwater Transportation Master Plan SCJ Alliance

HCM 2010 TWSC 17: Capitol Blvd & Cleveland Ave

Existing 2015
PM Peak Hour

Int Delay s/yeh 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		_	_	_	_
Mvmt 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 Stg 1							
Critical Hdwy Stg 2							
Follow-up Hdwy	,	3.34				2.21	,
Pot 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		WS	
HCM Control Delay, s	11.4			0		3.9	
HCM LOS	В						
Minor Long/Moior March	2 T			CMIT			
Canacity (yok/h)	NE	NDLIII		JAAC			
Capacity (verm)		0 0 0	240				
IICM Cartel Delay (c)		11.0	0.047				
HCM Control Delay (s)			9./				
HCM Lane LOS			⊳				
01:00:00		د	1				

Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

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

Existing 2015
PM Peak Hour

Intersection Summary Area Type: Cycle Length: 90 Actuated Cycle Length: 82.5 Natural Cycle: 90 Control Type: Actuated-Uncoordinated	Lead/Lag Lead-Lag Optimize? Recall Mode	Total Split (\$) Total Split (%) Yellow Time (\$) All-Red Time (\$) Lost Time Adjust (\$) Total Lost Time (\$)	Detector Phase Switch Phase Minimum Initial (s) Minimum Split (s)	Peak Hour Factor Heavy Vehicles (%) Shared Lane Traffic (%) Turn Type Protected Phases Permitted Phases	Storage Length (ft) Storage Lanes Taper Length (ft) Right Turn on Red Link Speed (mph) Link Distance (ft) Travel Time (s)	Lane Group Lane Configurations Traffic Volume (vph) Future Volume (vph) Ideal Flow (vphp))
Other other ngth: 82.5	e?	(S)		ic (%)		ns (h)
ner	None 4.5		8.0 22.0	0.90 1% 10% Split	150 1 25	EE \
	None	25.0 27.8% 3.5 1.0 0.0	8.0 22.0	0.90 1% NA	30	EBT ↓ 650 650
				0.90 1%	Yes 0	EBR 4
	None 4.5	33.3% 3.5 1.0 0.0	8.0 22.0	0.90 1% 10% Split 8	25 1	WBL 345
	None 4.5	33.3% 3.5 1.0 0.0	8.0 22.0	0.90 1% NA 8	30 631	WBT 1900
				0.90	Yes 0	WBR 5
	Lead Yes None	13.9% 13.9% 1.0 0.0	8.0 12.5	0.90 1% Prot 5	100 1 25	NBL 20
	Lag Yes Max	25.0% 25.0% 3.5 1.0 0.0	8.0 22.0	0.90 1% NA 2	30 2019	NBT NBT 330 330 330 330 330 330 330 330 330 33
				0.90 1%	Yes 0	NBR 425 425 1900
	Lead Yes None	13.9% 3.5 1.0 0.0	8.0 12.5	0.90 0% Prot	100 1 25	SBL 20
	Lag Yes Max	25.0% 25.0% 3.5 1.0 0.0	8.0 22.0	0.90 0% NA 6	30 1179	SBT → → → → → → → → → → → → → → → → → → →
				0.90	Yes Yes	SBR 135 135 1900

Tumwater Transportation Master Plan SCJ Alliance

Splits and Phases:

18: Capitol Blvd & Custer Way

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HCM 2010 Signalized Intersection Summary
18: Capitol Blvd & Custer Way

Existing 2015
PM Peak Hour

	•		,		Ì			-	,	_		_
	4	ţ	1	•	1	1	٠	_	7	*	+	4
Novement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	_#	♣		_#	\$ →		_#	∌		_#	⇟	
Traffic Volume (veh/h)	135	650	80	345	440	ı О	20	330	425	20	390	135
Future Volume (ven/h)	135	650	4 8	345	440	, 5	20	330	425	7 20	390	135
nitial O (Oh) wah	o ~	4 C	0 4	o 6	ο α	o a	5 0	0 ~	0 2	> -	0	0 6
Ped-Rike Adi/A nhT)	3	c	30	100	c	100	100	c	100	3	c	3 0
arking Bus, Adi	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	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	_	2	0	_	_	0	_	2	0	_	2	
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	_
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	0.29	0.04	0.22	0.22	0.04	0.22	0.22
sat Flow, veh/h	1792	3762	0	1792	1854	23	1792	2298	1165	1810	2639	906
3rp Volume(v), veh/h	150	722	0	383	0	495	22	284	272	22	295	288
Grp Sat Flow(s),veh/h/ln	1792	1881	0	1792	0	1877	1792	1787	1676	1810	1805	1740
2 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 O Clear(g_c), s	5.8	15.0	0.0	15./	0.0	20.7	1.0	12.1	12.4	1.0	12.5	12./
rop In Lane	1.00	0.4	0.00	1.00	>	0.01	1.00	203	0.70	1.00	207	0.52
IC Patio(V)	0 27	000	8 0	0.70	000	000	0 0 9	0 73	000	3 2	074	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
Jpstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Jniform 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
ncr Delay (d2), 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
nitial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	8.5	0.0	8.4	0.0	13.2	0.5	7.1	7.0	0.5	7.5	7.5
.nGrp 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	Ĺ
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	
imer	_	2	ယ	4	5	6	7	00				
Assigned Phs	_	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.6	22.5		23.2	7.6	22.5		28.5				
Change Period (Y+Rc), s	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				
Vlax Q Clear Time (g_c+l1), s	3.0	14.4		17.0	3.0	14.7		22.7				
Green Ext Time (p_c), s	0.0	2.2		1.7	0.0			1.3				
ntersection Summary						2.1						
			,			2.1						
HCM 2010 Ctrl Delay			38.7			2.1						

Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

Lanes, Volumes, Timings
19: Cleveland Ave & Custer Way/North St

Existing 2015
PM Peak Hour

Intersection Summary Area Type: Cycle Length: 90 Actuated Cycle Length: 88.6 Natural Cycle: 90 Control Type: Actuated-Uncoordinated	Lead-Lag Optimize? Recall Mode	Total Lost Time (s) Lead/Lag	Lost Time Adjust (s)	Yellow Time (s)	Total Split (%)	Minimum Split (s) Total Split (s)	Minimum Initial (s)	Switch Phase	Detector Phase	Permitted Phases	Protected Phases	Turn Type	Shared Lane Traffic (%	Heavy Vehicles (%)	Peak Hour Factor	Travel Time (s)	Link Distance (ft)	Link Speed (mph)	Right Turn on Red	Taper Length (ft)	Storage Lanes	Storage Length (ft)	Ideal Flow (vphpl)	Future Volume (vph)	Traffic Volume (vph)	Lane Configurations	Lane Group	
Other gth: 88.6 gted-Uncoordinates	? None		0.0	4.0	26.7%	22.0	6.0		2		2	Split	_	1%	0.93					25		100		_			EBL	,
	None	5.0	0.0	4.0	26.7%	24.0	6.0		2		2	NA		1%	0.93	14.3	631	30					1900	330	330	→	EBT	ļ
	None	5.0	0.0	4.0	24.4%	22.0	8.0		8	2	00	pm+ov		1%	0.93				Yes		_	0	1900	645	645	74	EBR	4
	None	5.0	0.0	4.0	24.4%	22.0	6.0		6		6	Split		1%	0.93					25	_	200	1900	15	15	J,	WBL	•
	None	5.0	0.0	4.0	24.4%	22.0	6.0		6		6	NA		1%	0.93	50.2	2207	30					1900	245	245	¥	WBT	†
														1%	0.93				Yes		0	0	1900	70	70		WBR	<i>></i>
	None	5.0	0.0	4.0	24.4%	22.0	8.0		8		00	Split	50%	1%	0.93					25	_	300	1900	480	480	_#	NBL	۶
	None	5.0	0.0	4.0	24.4%	22.0	8.0		00		00	NA		1%	0.93	66.4	2922	30					1900	135	135	\$÷	NBT	→
														1%	0.93				Yes		0	0	1900	15	15		NBR	•
	None		0.0			22.0	6.0		4		4	Split		2%	0.93					25	_	150	1900	105	105	JI.	SBL	•
	None		0.0			22.0	6.0		4		4	NA		2%	0.93	7.8	341	30					1900	280	280	→	SBT	←
	None	5.0	0.0	4.0	24.4%	22.0	6.0		4	4		Perm		2%	0.93				Yes		_	150	1900	105	105	74	SBR	•

Splits and Phases: 19: Cleveland Ave & Custer Way/North St

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Tumwater Transportation Master Plan SCJ Alliance

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

Existing 2015
PM Peak Hour

EBT EBR → → → → → → → → → → → → → → → → → → →	WBL	WBT T	WBR	NBL 🅕	NBT →	NBR	SBL 🗸	SBT	g 🔨
	8	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SRP
		ر کو کو		H	*				001
		2/5			2		-31	→	-34
		247	70	480	3 3	3 5	105	280	105
		245	1,0	3480	. 35	10	7	780	105
	-	5 0	0 6	o ω	> 00	o &	> ~	4 0	0 4
		c	100	100	c	100	3	c	1 8 0
1.00 1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
		1881	1900	1881	1881	1900	1863	1863	1863
		263	75	516	145	16	113	301	22
_	_	_	0	2	_	0	_	_	_
0.93 0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
		i _	¦ _	<u></u>			2	2	2
		275	79	619	287	32	325	342	290
		1409	402	3583	1665	184	1774	1863	1583
		0	338	516	0	161	113	301	22
		0	1810	1792	0	1849	1774	1863	1583
		0.0	16.1	12.1	0.0	6.9	4.8	13.7	1.0
		0.0	16.1	12.1	0.0	6.9	4.8	13./	1.0
		>	354	610	>	210	23 E	2.A.S	300
		0.00	0.96	0.83	0.00	0.50	0.35	0.88	0.08
		0	354	700	0	361	347	364	310
		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
		0.0	34.6	34.8	0.0	32.6	31.0	34.6	29.4
		0.0	36.1	7.8	0.0	1.2	0.5	20.1	0.1
		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		0.0	70.7	6.6	0.0	3.6	2.4	8.9	0.4
		0.0	ш	D	3	0	o :	0	0
995		354			677			436	
45.0		68.8			40.5			47.4	
D		ш			D			D	
2 3	4	5	6	7	8				
2	4		6		8				
24.0	21.0		22.0		20.0				
5.0	5.0		5.0		5.0				
19.0	17.0		17.0		17.0				
0.0	0.3		0.0		0.9				
47.6 D									
		1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00	12 0 0 0 1.00 1.00 1.00 1.00 1.00 1.00 1	10. 1.00 1.00 1.00 1.00 1.00 1.00 1.00	12. 0 0 0 0 10 100 100 100 100 100 100 100	12 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	10. 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	10. 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	10. 1. 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

> HCM 2010 TWSC 20: Hoadly St & North St

Existing 2015
PM Peak Hour

, vehth 50 270 2 10 395 50 1 2 5 25	Movement	EBE :	EBT	EBR		WBL	WBT	WBR	NBI	NBT		NBR	SBL	SB
, web, h 50 270 2 10 395 50 1 2 5 25 pleds, #hr 6 0 0 0 0 0 0 0 0 0 0 0 0 0 50p Stop	Traffic Vol, veh/h	50	270	2		10	395	50				σı	25	
Free Free Free Free Free Free Free Fre	Future Vol, veh/h	50	270	2		10	395	50			2	5 57	25	
elized - None -	Sian Control	Free	Free	Free		Free .	Free	Free	Stor			00	Stop	St
angth dian Storage, #	RT Channelized			None				None				ne		
dian Storage, # - 0 - - 0 - - 0 reactor 87 </td <td>Storage Length</td> <td></td> <td>•</td> <td></td> <td></td>	Storage Length											•		
Factor 87 87 87 87 87 87 87 87 87 87 87 87 87	Veh in Median Storage, #		0				0				0			
Fractor 87 87 87 87 87 87 87 87 87 87 87 87 101des.% 1 1 1 1 1 1 454 57 1 2 6 29 or Major1 Major2 Minor1 Minor2 Flow All 511 0 0 313 0 0 941 960 311 936 962 962 97 4.11 - 4.11 - 4.11 - 4.1 1.1	Grade, %		0				0					٠		
icles, % 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 29 ar Major Major Minor Minor Minor Minor Minor Minor 0 941 960 311 936 996 311 936 996 311 936 996 311 936 311 936 996 311 936 996 311 936 996 311 936 996 311 936 996 311 936 996 311 936 4 430 996 4 430 996 4 430 996 4 430 996 4 430 996 4 430 996 4 430 996 4 430 996 4 430 996 4 430 <	Peak Hour Factor	87	87	87		87	87	87	<u></u>			87	87	
Majort Majort Majort Majort Minort M	Heavy Vehicles, %	_	_	_		_	_	_	_			0	0	
richali Majori Majori Majori Minori M	Mvmt Flow	57	310	2		⇉	454	57				6	29	
Flow All	MajoriMinor	Majora				Sign			Minor				Minoro	
je 1 je 1 je 2	Conflicting Flow All	511	0	0		313	0	0	941			=	936	9
je 2	Stage 1								420			•	506	5(
wy 4.11 4.11 4.11 4.11 4.11 4.11 4.11 4.11 4.11 4.11 4.11 4.11 4.11 4.11 4.11 4.11 5.5 4.6 5.5 4.6 6.1 5.5 4.6 6.1 5.5 4.1 4.1 4.1 4.1 4.1 4.1 4.1 5.5 4.1 6.1 5.5 4.1 6.1 5.5 4.1 6.1 5.5 4.1 6.1 4.1 4.3 3.5 4.3 3.5 4.3 3.5 4.3 3.5 4.3 3.5 4.3 3.5 4.3 3.5 4.24 7.4 4.24 7.4 4.24 7.4 4.24 7.4 4.24 7.4 4.24 7.4 4.24 7.4 4.24 7.4 4.24 7.4 4.24 7.4 4.24 7.4 4.24 7.4 4.24 7.4 4.24 7.4 4.22 7.4 4.22 7.24 4.22 7.24 4.22	Stage 2								518		4	٠	430	4
wy Sig 1	Critical Hdwy	4.11				4.11			7.1			5.2	7.1	6
wyStg 2	Critical Hdwy Stg 1								6.				6.1	СЛ
Hdwy 2.209 - 2.209 - 3.5 4 3.3 3.5 3.5 4 3.3 3.5 4 3.3 3.5 3.5 4 3.3 3.5 4 3.3 3.5 3.5 3.5 4 3.3 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5	Critical Hdwy Stg 2								6.			•	6.1	СЛ
Maneuver 1059 - 1253 - 245 259 734 247 Maneuver 1059 - 670 552 Be 2 - 670 552 Maneuver 1059 - 1253 - 223 239 734 229 Maneuver 1059 - 1253 - 223 239 734 229 Maneuver 1059 - 1253 - 223 239 734 229 Maneuver - 1059 - 1253 - 223 239 734 229 Maneuver - 1059 - 1253 - 255 51 Be 1	Follow-up Hdwy	2.209		,		2.209	,		3.5			3.3	3.5	
ge 1	Pot Cap-1 Maneuver	1059	,	,		1253	,		245			34	247	2
Sept	Stage 1								610			٠	552	Ćι
becked % 1059 1253 229 223 239 734 229 Maneuver 223 229 229 229 229 Be 1 223 229 229 229 229 Be 2 223 239 229 229 Be 2 223 239 229 251 561 561 Be 2 23 232 23 552 561 561 Be 2 23 232 23 522 561 561 Be 3 23 24 24 25 25 561 561 Be 3 24 25 26 14.1 19.5 19.5 19.5 Be 4 34	Stage 2								540		00		607	5
Maneuver 1059 - 1253 - 223 239 734 229 2 Maneuver - 2 23 239 739 229 2 Maneuver - 2 23 239 229 2 Maneuver - 2 23 239 229 2 29 2 29 2 29 2 29 2 29 2	Platoon blocked, %													
Maneuver	Mov Cap-1 Maneuver	1059	·			1253	,		223			34	229	2
ge 1	Mov Cap-2 Maneuver			,					22:			٠	229	2
Se2	Stage 1		í	í		ì	į.		570		_,	•	516	5
rol Delay, S 1.3 0.2 14.1 Bulkajor Mvmt NBLn1 EBL EBT EBR WBL WBT WBR SBLn1 WC Ratio 0.033 0.054 - 1.1253 - 296 W/C Ratio 0.033 0.054 - 0.009 - 0.159 rol M/C Ratio 0.033 0.054 - 7.9 0 - 19.5 rol M/C Ratio 0.033 0.054 - 0.059 - 0.159 rol M/C Ratio 0.033 0.054 - 0.059 - 0.159 rol M/C Ratio 0.033 0.054 - 0.059 - 0.159 rol M/C Ratio 0.033 0.054 - 0.059 - 0.159	Stage 2	ı.							52:		2		561	550
EB														
rol Delay, s 1.3 0.2 14.1 B 2/Major Mvmt NBLn1 EBL EBT EBR WBL WBT WBR SBLn1 velv(h) 407 1059 - 1253 - 296 velv(C Ratio 0.023 0.054 - 0.0559 rol Delay (s) 14.1 8.6 0 - 7.9 0 - 19.5 p(LOS B A A - A A - C	Approach	EB				WB			NE	ω			SB	
B 2/Major Mvmt NBLn1 EBL EBT EBR WBL WBT WBR SBLn1 welrh) 407 1059 - 1253 - 296 welrh 0.023 0.054 - 0.059 rol Delay (s) 14.1 8.6 0 - 7.9 0 - 19.5 LOS B A A - A A - C	HCM Control Delay, s	1.3				0.2			14.	_			19.5	
mt NBIN1 EBL EBT EBR WBL WBT WBR: 407 1059 - 1253 0.023 0.054 - 0.009 141 8.6 0 - 7.9 0 - B A A - A A -	HCM LOS								_				C	
407 1059 - 1253		NBLn1	EBL	EBT	EBR	WBL	WBT	WBR SB	5					
0.023 0.054 - 0.009	Minor Lane/Major Mvmt		1059			1253			296					
s) 14.1 8.6 0 - 7.9 0 - B A A - A A -	Minor Lane/Major Mvmt Capacity (veh/h)		0.054			0.009			159					
B A A - A A -	Minor Lane/Major Mymt Capacity (veh/h) HCM Lane V/C Ratio		0			0.00.	>		5					
	Minor Lane/Major Mvmt Capacity (veh/h) HCM Lane V/C Ratio HCM Control Delay (s)		0.0	0		7.9	c		17.3					

Tumwater Transportation Master Plan SCJ Alliance

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)	<u>۔</u> ن	12.2	2.7	0.8	2.4

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

Existing 2015
PM Peak Hour

Natural Cycle: 80 Control Type: Actuated-Uncoordinated	Actuated Cycle Length: 74.9	Cycle Length: 80	Area Type:	Intersection Summary	Recall Wode	Lead-Lag Optimize?	Lead/Lag	Total Lost Time (s)	Lost Time Adjust (s)	All-Red Time (s)	Yellow Time (s)	Total Split (%)	Total Split (s)	Minimum Split (s)	Minimum Initial (s)	Switch Phase	Detector Phase	Permitted Phases	Protected Phases	Turn Type	Shared Lane Traffic (%)	Heavy Vehicles (%)	Peak Hour Factor	Travel Time (s)	Link Distance (ft)	Link Speed (mph)	Right Turn on Red	Taper Length (ft)	Storage Lanes	Storage Length (ft)	Ideal Flow (vphpl)	Future Volume (vph)	Traffic Volume (vph)	Lane Configurations	Lane Group	
d-Uncoordinated	1: 74.9		Other		None	:				1.0	3.5	42.5%	34.0	29.5	10.0		4	4		Perm	0	1%	0.86					25	0	0	1900	90	90		EBL	,
					None			4.5	0.0	1.0	3.5	42.5%	34.0	29.5	10.0		4		4	NA		1%	0.86	6.4	282	30					1900	90	90	\$	EBT	Ļ
																						1%	0.86				Yes		0	0	1900	255	255		EBR	4
					None					1.0	3.5	42.5%	34.0	29.5	10.0		00	00		Perm		0%	0.86					25	0	0	1900	115	115		WBL	4
					None			4.5	0.0	1.0	3.5	42.5%	34.0	29.5	10.0		00		00	NA		0%	0.86	10.9	479	30					1900	90	90	₽	WBT	†
																						0%	0.86				Yes		0	0	1900	130	130		WBR	~
					None	Yes	Lead	4.5	0.0	1.0	3.5	22.5%	18.0	9.5	5.0		5		5	Prot		1%	0.86					25	_	175	1900	215	215	JI.	NBL	۶
					N N	Yes	Lag	4.5	0.0	1.0	3.5	37.5%	30.0	26.5	8.0		2		2	NA		1%	0.86	43.2	1902	30					1900	445	445	ᢌ	NBT	→
																						1%	0.86				Yes		0	0	1900	130	130		NBR	•
					None	Yes	Lead	4.5	0.0	1.0	3.5	20.0%	16.0	9.5	5.0		_		_	Prot		1%	0.86					25	_	150	1900	190	190	_#	SBL	•
					N N	Yes	Lag	4.5	0.0	1.0	3.5	35.0%	28.0	26.5	8.0		6		6	NA		1%	0.86	45.9	2019	30					1900	585	585	≯	SBT	←
																						1%	0.86				Yes		0	0	1900	70	70		SBR	•

18s | 28s |

34s 7 Ø8

22: E St & Capitol Blvd

SimTraffic Report 2/8/2016

Tumwater Transportation Master Plan SCJ Alliance

HCM 2010 Signalized Intersection Summary 22: E St & Capitol Blvd

Existing 2015
PM Peak Hour

	-	ļ	1	^	Ť	>	٠	→	*	•	—	4
Movement	EBE	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
ane Configurations		\$ →			₽		æ	→		J,	∌	
Traffic Volume (veh/h)	90	90	255	115	90	130	215	445	130	190	585	70
uture Volume (veh/h)	90	90	255	115	90	130	215	445	130	190	585	70
Number	7	4	14	ω	00	18	5	2	12	_	6	16
nitial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
ed-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00	8	1.00	1.00		1.00
Adi Sat Elow, yek/k/ln	1000	1881	1900	1000	1000	1900	1991	1881	1900	1881	1881	1000
Adi Flow Rate, veh/h	105	105	0	134	105	151	250	517	151	221	680	82
Adj No. of Lanes	0	_	0	0	_	0	_	2	0	_	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, %	_	_	_	0	0	0	_	_	_	_	_	_
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	2734	795	1792	3218	383
3rp Volume(v), veh/h	210	0	0	390	0	0	250	337	331	221	377	384
Grp Sat Flow(s),veh/h/ln	1333	0	0	1630	0	0	1792	1787	1741	1792	1787	1814
2 Serve(g_s), s	0.0	0.0	0.0	3 5 5 5	0.0	0.0	0 .4	9.7	9.8	7.4	11.4	11.5
Oron In Lane	0 7.5	0.0	000	0.37	0.0	0.0	100	7.7	0.46	100		0 -1.5
_ane Grp Cap(c), veh/h	489	0	0	569	0	0	302	592	577	269	560	568
//C Ratio(X)	0.43	0.00	0.00	0.69	0.00	0.00	0.83	0.57	0.57	0.82	0.67	0.68
4vail Cap(c_a), veh/h	732	0	0	837	0	0	389	732	713	331	675	685
ICM 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
Jpstream Filter(t)	17.6	0.00	0.00	19 7	0.00	0.00	25.0	17.0	17.00	25.6	18.6	186
ncr Delay (d2), s/veh	0.6	0.0	0.0	1.5	0.0	0.0	=======================================	0.9	0.9	12.6	2.0	2.0
nitial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	<u>ω</u>	0.0	0.0	6.3	0.0	0.0	5.1	4.9	4.8	4.6	5.9	6.1
_nGrp Delay(d),s/veh	18.2	0.0	0.0	21.1	0.0	0.0	36.2	18.0	18.1	38.2	20.6	20.6
_nGrp LUS	a			C			c	α	σ	c	C	
Approach Vol, veh/h		210			390			918			982	
Approach Delay, s/veh		18.2			21.1			23.0			24.6	
Approach LUS		σ			C			C			C	
Timer		2	ω	4	5	6	7	8				
Assigned Phs	_	2		4	5	6		00				
Phs 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+l1), s	9.4	11.8		9.9	10.4	13.5		15.3				
Green Ext Time (p_c), s	0.1	1.5		3.9	0.2	6.0		3.4				
ntersection Summary												
HCM 2010 Ctrl Delay												
HCM 20101 OS			22.9									

Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

HCM 2010 TWSC 23: Cleveland Ave & South St

Existing 2015
PM Peak Hour

Movement	WBL	WBR		NBR	SBL	SBT
Traffic Vol, veh/h	5	15	_	10	15	ω
Future Vol, veh/h	_Ω	15		10	15	855
Conflicting Peds, #/hr	0	0	0	0	0	
Sign Control	Stop	Stop		Free		_
RT Channelized		None		None		None
Storage Length	0					
Veh in Median Storage, #	0		0			
Grade, %	0		0			
Peak Hour Factor	88	88	88	88	88	
Heavy Vehicles, %	0	0	_	_		
Mvmt Flow	6	17	648	⇉	17	
Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1173	330	0	0	659	
Stage 1	653			·		
Stage 2	520					
Critical Hdwy	6.8	6.9			4.12	
Critical Hdwy Stg 1	5.8					
Critical Hdwy Stg 2	5.8					
Follow-up Hdwy	3.5	3.3			2.21	
Pot Cap-1 Maneuver	188	672		·	932	
Stage 1	485					
Stage 2	567					
Platoon blocked, %						
Mov Cap-1 Maneuver	180	672			932	
Mov Cap-2 Maneuver	180	,	,			
Stage 1	485	,				
Stage 2	544					
Approach	MD		NID		CB	
HCM Control Delay, s	14.6		0		0.4	
HOMIOS						
HCM LOS	σ					
Minor Lane/Major Mvmt	NBT	NBRWBLn1 SBL	SBT			
Capacity (veh/h)						
HCM Lane V/C Ratio		0				
		1//				
HCM Control Delay (s)		14.0				
HCM Control Delay (s) HCM Lane LOS		В .	Α			

Tumwater Transportation Master Plan SCJ Alliance

HCM 2010 TWSC 24: Linwood Ave & 7th Ave

Existing 2015
PM Peak Hour

Hree Free Free Free Free Free Free Free	Int Delay, s/veh 3.3 Movement Traffic Vol, veh/h Future Vol, veh/h Conflicting Peds, #/hr		EBT 140 140 0	EBR 0	WBL		WBR 225 225 0	NBL 0	NBT 0	NBR		
Free Free Free Free Free Free Free Free	Conflicting Peds, #/hr	0	0	0	0		0	0			0	0 0
Be.#	RT Channelized	- Free	- Tee	None	- Free		None	- Siop		- Stop		- clob
ye,# 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Storage Length								1			
Majori Major 2 Major 2 Major 3 Major 2 Major 2 Major 3 Major 2 Majo	Veh in Median Storage, #		0		1	0				- 0		
Majori Major	Grade, %		0			0					0	0 -
Major1 Major2 Major1 Major2 522 151 0 151 0 0 522 0 0 151 0 0 4.13 - 4.11 - 6 2.227 - 2.209 - 6 2.227 - 2.209 - 6 1039 - 1436 - 6 1 139 - 1436 - 6 1 1	Peak Hour Factor	93	93	93	93	93	93		93			93
Majori Major2 Majori Major2 522 0 0 151 0 0 522 0 0 151 0 0 4.13 - 4.11 - 2209 - 2227 2227 - 2209 - 1436 1039 - 1436 1039 - 1436 1436 0 5 11 0 0 0 EB WB WB WB WB WB WB S 9 901 1039 - 1436 0	Heavy Vehicles, %	ω	ω	ယ	_	_	_		0		0	0 0
Major! Major2 522 0 0 151 0 0 4.13 - 4.11 - 6 2.227 - 2.209 - 6 2.227 - 2.209 - 6 1039 - 1436 - 6 1039 - 1436 - 6 1039 - 1436 - 6 1039 - 1436 - 6 1039 - 1436 - 6 1039 - 1436 - 6 1040 - 1436 - 6 1050 - 1436 - 6 1070 - 1031 - 1436 - 6 1070 - 1031 - 1436 - 6 1070 - 1031 - 1436 - 6 1070 - 1031 - 1436 - 6 1070 - 1031 - 1436 - 6 1070 - 1031 - 1436 - 6 1070 - 1031 - 1436 - 6 1070 - 1031 - 1436 - 6 1070 - 1031 - 1436 - 6 1070 - 1031 - 1436 - 6 1070 - 1031 - 1436 - 6 1070 - 1031 - 1436 - 6 1070 - 1031 - 1436 - 6 1070 - 1031 - 1436 - 6 1070 - 1031 - 1436 - 6 1070 - 1031 - 1436 - 6 1070 - 1031 - 1436 - 6 1070	Mvmt Flow	22	151	0	_	280	242		0		0	0
522 0 0 151 0 0 4.13 4.11 2.209	Major/Minor	Major1			Major2			=	inor1	inor1	inor1	inor1 Minor2
### WBLn1 EBL EBT EBR WBL WBT WBR SE	Conflicting Flow All	522	0	0	151	0	0		605	605 718		718 151
4.13 4.11 2.209 2.227 2.209 1436 1039 1436 1 1039 1436 1 1039 1436 1 1039 1436 1 1039 1436 1 1039 1436 1 1039 1436 1 1039 1436 1 1039 1436 1 1039 1436 1 1039 1436 1 1031	Stage 1								194		194	194 -
#13	Stage 2		ı,	ı,					411		524	524 -
2,227 2,209 2, 2,209 1,2	Critical Hdwy	4.13			4.11				7.1			6.5 6.2
2227 229 229 1436 1 1039 1436 1 1436	Critical Hawy Stg 1								6.1	6.1 5.5	л (J л (J	л (J л (J
1039	Follow-up Hdwy	2.227			2.209				ω 5			4 3.3
T 1039 1436	Pot Cap-1 Maneuver	1039			1436				413	(4)	357	357 901
TO 1039	Stage 1								812		744	744 -
EB WB WB WBT WBR SE 901 10.39	Stage 2								622	622 533		533 -
EB WB S 1.1 001 1039 - 1436	Platoon blocked, %								1		5	
EB WB S 1.1 0 NBLn1 EBL EBT EBR WBL WBT WBR SE 901 1039 - 1436 - 901 0.021 - 0.001 - 0 S) 9 8.5 0 - 7.5 0 - 0.001 A A A A A A A A A A	Mov Cap-1 Maneuver	1039			1436				395			348 901
EB WB S 1.1 0 NBLn1 EBL EBT EBR WBL WBT WBR SE 901 1039 - 1436 - 901 0.21 - 0.001 - 0 \$ 9 8.5 0 - 7.5 0 - 0.00	Mov Cap-2 Maneuver								395			348 - 727
EB WB 1.1 0 1.1 0 1.1 0 WBLNI EBL EBT EBR WBL WBT WBR SE 901 1039 - 1436 - 901 0.21 - 0.001 - 0.0 \$\$ 0.001 0.21 - 0.001 - 0.0 \$\$ 9 8.5 0 - 7.5 0 - 0.00 \$\$ 0 8.5 0 - 7.5 0 - 0.00	Stage 2								606	606 532		
EB WB s 1.1 0 mt NBLn1 EBL EBT EBR WBL WBT WBR SE 901 1039 1436 0 0.001 0.021 0.001 0 s) 9 8.5 0 - 7.5 0 S) 9 8.5 0 - 7.5 0 A A A A - A A	¢											
s 1.1 0 mt NBLn1 EBL EBT EBR WBL WBT WBR SE 901 1039 - 1436 - 001 0.021 - 0.001 - 0 s) 9 8.5 0 - 7.5 0 - 0 A A A A - A A - A A - 1	Approach	EB			WB				NB	NB	NB	NB SB
mt NBLn1 EBL EBT EBR WBL WBT WBR SE 901 1039 - 1436 0.001 0.021 0.001 0 \$\$ 9 8.5 0 - 7.5 0 - \ \$\$ A A A - A A - \ \$\$ A A - A A - \ \$\$ A A - A A - \ \$\$ A A - A A - A A - \ \$\$ A A - A A - A A - \ \$\$ A A - A A - A A - \ \$\$ A A - A A - A A - A A - \ \$\$ A A - A A - A A - A A - \ \$\$ A A - A A - A A - A A - A A - \ \$\$ A A - A A - A A - A A - A A - \ \$\$ A A -	ICM Control Delay, s	1.1			0				9	9	9	1
mt NBLn1 EBL EBT EBR WBL WBT WBR SE 901 1039 - 1436 0,001 0,021 - 0,001 0 S) 9 8.5 0 - 7.5 0 - A A A A A A A A	HCM LOS								Þ	Α	Α	
901 1039 - 1436 0 0.001 0.021 - 0.001 0 \$) 9 8.5 0 - 7.5 0 - A A A A A A A	Minor Lane/Major Mvmt	NBLn1	EBL	EBT		WBT	WBR SB	בׁן				
0.001 0.021 - 0.001 - 0 9 8.5 0 - 7.5 0 - 0.001 - 0.001	2apacity (veh/h)		1039					126				
Hay (S) 9 8.5 0 - 7.5 0 -	ICM Lane V/C Ratio	0.001	0.021	، د	- 0.001	٠, د	- 0.	, 41				
A A . A A .	ICM Control Delay (s)		. 00	0	- 7.5	. 0		7.8				
	TOM Cane LOS	> D	2 A	A	, A	Þ		, (

HCM 2010 AWSC 25: Linwood Ave & 2nd Ave

Existing 2015
PM Peak Hour

Intersection									ı			
Intersection Delay, s/veh	25											
Intersection LOS	С											
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	
Future Vol, veh/h	0	30	165	100	0	100	245	60	0	105	115	
Peak Hour Factor	0.92	0.89	0.89	0.89	0.92	0.89	0.89	0.89	0.92	0.89	0.89	0.89
Heavy Vehicles, %	2	_	_	_	2	_	_	_	2	0	0	
Mvmt Flow	0	34	185	112	0	112	275	67	0	118	129	
Number of Lanes	0	_	_	0	0	_	_	0	0	_	_	
Approach		B				WB				æ		
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		25.2				28.5				18.5		
HCM LOS		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										
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			
Degree 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										
Cap		398	441	399	441	411	449	405	450			
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			
HOM Control Dolay		15.6	20	12.6	26.6	14.7	33	13.6	29.6			
TCIVI CUITII OI DEIDY		0.0		D	D	æ	D	В	D			
HCM Lane LOS		0	0	σ		(1			

Tumwater Transportation Master Plan SCJ Alliance

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	_	_	_	
Mvmt Flow	0	73	185	140	
Number of Lanes	0	_	_	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					

Synchro 9 Report 6/10/2016

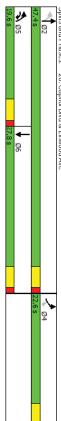
Tumwater Transportation Master Plan SCJ Alliance

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

Existing 2015
PM Peak Hour

Natural Cycle: 70 Control Type: Actuated-Uncoordinated	Actuated Cycle Length: 63.3	Cycle Length: 70	Area Type: Other	Intersection Summary	Recall mode None None None Max	otimize? Yes Yes	Lead Lead	Time (s) 4.5 4.5 4.5 4.5) 0.0 0.0 0.0 0.0	1.0 1.0 1.0 1.0	3.5 3.5 3.5 3.5	32.3% 28.0% 28.0% 67.7%	22.6 19.6 19.6 47.4	t(s) 22.5 19.5 19.5 20.0	si (s) 5.0 15.0 15.0 15.0	Switch Phase	Detector Phase 4 5 5 2	Permitted Phases 4 2	hases 4 5	Prot pm+ov pm+pt	: (%)	6) 1% 1% 1%	or 0.84 0.84 0.84 0.84	11.1 60.5	489 2664	30 30	d Yes	ft) 25	_) 150 0 150	1900 1900 1900 1900	165 145 155 625	165 145 155 625	7 7 **	Lane Group EBL EBR NBL NBT	\ * !
					Mdx	Yes	Lag	4.5	0.0	1.0	3.5	.7%	27.8	21.5	15.0		6		6	NA		1% 1%	0.84 0.84	13.2	1902		Yes		0		900 1900		705 240	₹ ₽	SBT SBR	4

Splits and Phases: 26: Capitol Blvd & Linwood Ave



Tumwater Transportation Master Plan SCJ Alliance

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

Existing 2015
PM Peak Hour

				16.9			HCM 2010 Ctrl Delay
							Intersection Summary
	3.2	0.2	0.5		15.1		Green Ext Time (p_c), s
	19.3	4.3	8.4		6.7		Max Q Clear Time (g_c+l1), s
	23.3	15.1	18.1		42.9		Max Green Setting (Gmax), s
	4.5	4.5	4.5		4.5		Change Period (Y+Rc), s
	28.6	18.8	13.3		47.4		Phs Duration (G+Y+Rc), s
	6	σ	4		2		Assigned Phs
8	6 7	5	4	ω	2		Timer
		С	A			C	Approach LOS
		26.1	4.6			20.3	Approach Delay, s/veh
		1125	929			369	Approach Vol, veh/h
	С	С	Þ	Þ	В	C	LnGrp LOS
	26.3	25.9	3.6	8.5	13.1	26.6	LnGrp Delay(d),s/veh
	10.0	10.3	2.4	1.4	4.7	ა ა	%ile BackOfQ(50%),veh/ln
	0.0	0.0	0.0	0.0	0.0	0.0	Initial Q Delay(d3),s/veh
	10.0	9.6	0.3	0.1	0.1	1.7	Incr Delay (d2), s/veh
	16.3	16.3	ω ω	8.4	13.0	24.9	Uniform Delay (d), s/veh
	1.00	1.00	1.00	1.00	1.00	1.00	Upstream Filter(I)
	1.00	1.00	1.00	1.00	1.00	1.00	HCM Platoon Ratio
	683	708	2526	620	854	534	Avail Cap(c_a), veh/h
	081	0.81	0.20	0 31	0.00	0.75	V/C Ratio(X)
	0.52	700	7C 3C	1.00	1.00	1.00	Prop In Lane
	17.3	17.3	4.7	2.3	4.6	6.4	Cycle Q Clear(g_c), s
	17.3	17.3	4.7	2.3	4.6	6.4	Q Serve(g_s), s
	1724	1787	1787	1792	1599	1792	Grp Sat Flow(s),veh/h/ln
	553	572	744	185	173	196	Grp Volume(v), veh/h
	892	2713	3668	1792	1599	1792	Sat Flow, veh/h
	0.40	0.40	0.71	0.24	0.15	0.15	Arrive On Green
	2F.2	1038	25.26 -	дод –	610	360 -	Can vehih
	0.84	0.84	0.84	0.84	0.84	0.84	Peak Hour Factor
	0	2	2				Adj No. of Lanes
	286	839	744	185	173	196	Adj Flow Rate, veh/h
	1900	1881	1881	1881	1881	1881	Adj Sat Flow, veh/h/ln
	1.00	1.00	1.00	1.00	1.00	1.00	Parking Bus, Adj
	1.00			1.00	1.00	1.00	Ped-Bike Adj(A_pbT)
	0	0	0	0	0	0	Initial Q (Qb), veh
	16	6	2	5	14	7	Number
	240	705	625	155	145	165	Future Volume (veh/h)
	240	705	625	155_	145	165 _	Traffic Volume (veh/h)
		}	>	Ħ	-34	Ħ	Lane Configurations
	SBR	SBT	NBT	NBL	EBR	EBL	Movement
	*	+	_	J	4	\	
	•	-				•	

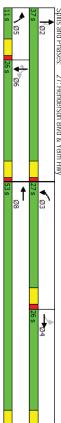
Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

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

Existing 2015
PM Peak Hour

Splits and Phases: 27: Henderson Blvd & Yelm Hwy



Tumwater Transportation Master Plan SCJ Alliance

HCM 2010 Signalized Intersection Summary 27: Henderson Blvd & Yelm Hwy

Existing 2015
PM Peak Hour

Movement EB EB EB EB WB WB WB NB NB SB SB SB SB SB SB SB SB SB S		-	ļ	1	^	Ť	>	۶	→	*	•	—	•
urations	Movement	EBL	EBT	EBR •	WBL .	WBT	WBR	NBL .	NBT .	NBR ·	SBL	SBT	SBR
per (peth) 5 680 160 430 505 80 110 165 645 155 205 pro (peth) 5 680 160 430 505 80 110 165 645 155 205 pro (peth) 7 4 14 3 8 18 15 2 12 1 6 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Lane Configurations	Ħ	}		Ħ	→		Ħ	→	-14	Ħ	→	-4
time (velyht) 5 680 160 430 505 80 110 165 645 155 205 J, velh 0	Traffic Volume (veh/h)	5	680	160	430	505	80	110	165	645	155	205	20
7	Future Volume (veh/h)	5	680	160	430	505	80	110	165	645	155	205	20
Juch 0 1.00	Number	7	4	14	ω	00	18	5	2	12	_	6	16
MichaphT 1.00 1.	Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
A, A, A, B, A, C, A, A, B, A, A, A, B,	Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
L, velchlylin 1881 1881 1990 1881 1881 1890 1881 1881	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
le, veh/h shy shy shy shy shy shy shy shy shy sh	Adj Sat Flow, veh/h/ln	1881	1881	1900	1881	1881	1900	1881	1881	1881	1881	1881	1881
ances 1 2 0 0 1 2 0 0 1 1 2 1 1 1 1 1 1 1 1 1	Adj Flow Rate, veh/h	5	747	176	473	555	88	121	181	0	170	225	22
ractor 0.91 0.92 0.92	Adj No. of Lanes	_	2	0	_	2	0	_	_	_	_	_	
wy Veh, % 21 2 2	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
288 738 174 482 1792 283 139 589 501 306 342 feeen ceen c.26 0.26 0.27 0.58 0.58 0.50 306 342 with c.26 0.26 0.27 0.58 0.58 0.58 0.50 306 0.18 0.18 with c.26 0.26 0.26 0.27 0.58 0.58 0.58 0.50 0.18 0.18 with c.26 0.26 0.27 0.58 0.28 0.29 1792 1881 1599 1210 1881 0.00 0.18 0.18 0.00 0.18 0.18 0.	Percent Heavy Veh, %	_	_	_	_	_	_	_	_	_	_	_	_
recen 0.26 0.26 0.26 0.27 0.58 0.58 0.08 0.31 0.00 0.18 0.18 hyhh 791 2872 677 1792 3093 489 1792 1881 1599 1210 1881 (k), veh/h 5 465 458 473 320 323 121 181 0 170 225 art(Q.), veh/h 791 1787 1762 1792 1787 1795 1795 1792 1881 1599 1210 1881 art(Q.), veh/h 791 1787 1762 1787 1795 1795 1792 1881 1599 1210 1881 art(Q.), veh/h 289 459 452 22.0 7.7 7.7 5.6 6.1 0.0 11.2 9.3 ap(c), veh/h 289 459 452 482 1035 1040 139 589 501 306 342 ap(c), veh/h 289 459 452 482 1035 1040 139 589 501 306 342 ap(c), veh/h 289 459 452 482 1035 1040 139 70.31 0.00 0.56 0.66 ap(d), veh/h 289 459 452 482 1035 1040 139 70.31 0.00 0.56 0.66 ap(d), veh/h 289 459 452 482 1035 1040 139 70.31 0.00 0.56 0.66 ap(d), veh/h 200 1.00 1.00 1.00 1.00 1.00 1.00 1.00	Cap, veh/h	289	738	174	482	1792	283	139	589	501	306	342	291
min /YI 28/72 6/1 1/Y2 30/3 489 1/Y2 188 15/94 12/10 188 (f), veh/hr/n 791 1787 1762 1792 1787 1792 188 1599 1210 188 ard(g_c), s 0.4 21.5 21.5 22.0 7.7 7.7 5.6 6.1 0.0 11.2 9.3 ard(g_c), seh/hr 289 459 452 482 1035 1040 139 589 501 30.6 342 ap(c), veh/hr 289 459 452 482 1035 1040 139 589 501 306 342 ap(c), veh/hr 289 459 452 482 1035 1040 139 589 501 306 342 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 1.00 1.00 1.00	Arrive On Green	0.26	0.26	0.26	0.27	0.58	0.58	0.08	0.31	0.00	0.18	0.18	0.18
(M), vehrlin 54 465 458 473 320 323 121 181 0 170 225 w(S), vehrlvlin 791 1787 1795 1792 1881 1599 1210 1881 3), s 0.4 21.5 21.5 22.0 7.7 7.7 5.6 6.1 0.0 11.2 9.3 ard(g_c), s 0.4 21.5 21.5 22.0 7.7 7.7 5.6 6.1 0.0 11.2 9.3 ap(c), vehrlin 289 459 452 482 1035 1040 139 589 501 306 342 ap(c), vehrlin 289 459 452 482 1035 1040 139 589 501 306 342 w(0), sylveh 233 31.1 31.1 30.4 9.0 1.00 1.00 1.00 1.00 1.00 1.00 1.00	Sat Flow, veh/h	/91	28/2	6//	1/92	3093	489	7/92	1881	1599	01.71	188	1599
Wis, Varinium 791 1787 1792 1793 1793 1210 1881 S) S ard(Q.C), S 0.4 21.5 21.5 21.5 21.5 21.6 6.1 0.0 11.2 9.3 app(c), veh/h 289 459 452 282 100 100 100 100 112 9.3 app(c), veh/h 289 459 452 482 1035 1040 139 589 501 306 342 ap), veh/h 289 459 452 482 1035 1040 139 730 621 397 483 n Ratio 1.00 <th< td=""><td>Grp Volume(v), veh/h</td><td>2 2</td><td>465</td><td>458</td><td>473</td><td>320</td><td>323</td><td>121</td><td>1 2 2</td><td>0</td><td>170</td><td>225</td><td>22</td></th<>	Grp Volume(v), veh/h	2 2	465	458	473	320	323	121	1 2 2	0	170	225	22
ari(q_c), s 0.4 21.5 22.0 7.7 7.7 5.6 6.1 0.0 11.2 9.3 ari(q_c), s 0.4 21.5 21.5 22.0 7.7 7.7 5.6 6.1 0.0 11.2 9.3 ari(q_c), s 0.4 21.5 21.5 22.0 7.7 7.7 5.6 6.1 0.0 11.2 9.3 ari(q_c), s 0.4 21.5 21.5 22.0 7.7 7.7 5.6 6.1 0.0 11.2 9.3 ari(q_c), s 0.4 21.00 0.38 1.00 0.27 1.00 0.5 0.6 0.5 0.6 0.5 0.6 0.5 0.6 0.5 0.6 0.5 0.6 0.5 0.6 0.5 0.6 0.5 0.6 0.5 0.6 0.5 0.6 0.5 0.6 0.5 0.6 0.5 0.5 0.6 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5	Grp Sat Flow(s), veh/h/ln) 191	/8/	1/62	1/92	/8/	1/95	1/92	1881	1599	1210	1881	1599
angy-by, so 1,004 2,13 2,23 2,20 3,7 7,7 3,00 6,1 1,00 1,00 angy(c), veh/h 289 459 452 482 1035 1040 139 589 501 306 342 3), veh/h 289 459 452 482 1035 1040 139 589 501 306 366 3,0 veh/h 289 459 452 482 1035 1040 139 793 621 397 483 nr Railio 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,0	U Serve(g_s), s	0.4	2 2	21.5	22.0	7.7	7.7	5.6	6.1	0.0	11.2	9.3	1.0
ap(c), veh/h 289 459 459 452 482 1035 1040 139 589 501 306 342 ap(c), veh/h 289 459 452 482 1035 1040 139 589 501 306 342 ap), ap), she/h 289 459 452 482 1035 1040 139 730 601 300 0.66 lear) 1,00 </td <td>Pron In Lane</td> <td>100</td> <td>1</td> <td>0.38</td> <td>100</td> <td></td> <td>0.27</td> <td>100</td> <td>-</td> <td>100</td> <td>100</td> <td>ì</td> <td>100</td>	Pron In Lane	100	1	0.38	100		0.27	100	-	100	100	ì	100
A) (A) (A) (A) (A) (A) (A) (A) (A) (A) (Lane Grp Cap(c), veh/h	289	459	452	482	1035	1040	139	589	501	306	342	291
a), veh/h 289 459 452 482 1035 1040 139 730 621 397 483 fraitain 1000 1.00 1.00 1.00 1.00 1.00 1.00 1.0	V/C Ratio(X)	0.02	1.01	1.01	0.98	0.31	0.31	0.87	0.31	0.00	0.56	0.66	0.08
In Ratio 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0	Avail Cap(c_a), veh/h	289	459	452	482	1035	1040	139	730	621	397	483	411
lier(I) 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0	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
yy(d), siveh 23 31.1 30.1 49.0 9.0 36.2 21.9 0.0 32.0 31.8 21.2), siveh 20 1.45.2 45.5 36.3 0.8 0.8 40.6 0.3 0.0 1.6 22.9 3.4 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
y(d), sveh	Uniform Delay (d), s/veh	23.3	3.	31.1	30.4	9.0	9.0	38.2	21.9	0.0	32.6	31.8	28.4
(Q)(S/Veh 1) 0.1 16.2 16.0 15.6 4.0 4.0 4.3 32 0.0 3.9 5.0 (Q)(S/Veh 1) 0.1 16.2 16.0 15.6 4.0 4.0 4.3 32 0.0 3.9 5.0 (Q)(S/Veh 1) 23.4 76.3 76.7 66.7 9.8 9.8 78.8 22.1 0.0 34.2 34.0 (C) C F F F E A A E C C C C C C C C C C C C C C C C	Initial O Delay(d3) sheh	0 :-	0.0 2.04	0.0	00.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	0 0
(d)/s/veh 23.4 76.3 76.7 66.7 9.8 9.8 78.8 22.1 0.0 34.2 34.0 L, veh/h 928 1116 302 417 belay, s/veh 76.2 33.9 44.8 33.8 DS 1 2 3 4 5 6 7 8 18 2 3 4 5 6 7 8 8 10(G/Y+RC), s 30.7 27.0 26.0 110.0 19.7 53.0 53.0 53.0 6 8 8 6 7 8 8 6 7 8 7 7 7 7 7 7 7 7 7 8	%ile BackOfQ(50%).veh/ln	0.1	16.2	16.0	15.6	4.0	4.0	4.	ω !>	0.0	3.9	5.0	0.4
C F F E A A E C C C C C C C C C C C C C C C C	LnGrp Delay(d),s/veh	23.4	76.3	76.7	66.7	9.8	9.8	78.8	22.1	0.0	34.2	34.0	28.5
ol, veh/h 228 elay, s/veh 76.2 110 302 elay, s/veh 76.2 33.9 44.8 30.9 44.8 30.9 44.8 5 6 7 8 12 3 4 5 6 7 8 13 1 2 3 4 5 6 8 14 5 6 8 16 7 (G+Y+Rc), s 27.0 26.0 11.0 19.7 53.0 10 (Y+Rc), s 4.5 4.5 4.5 4.5 4.5 10 (Q+Rc), s 4.5 4.5 4.5 4.5 10 (Q+Rc), s 4.5 4.5 4.5 4.5 10 (Q+Rc), s 32.5 22.5 21.5 6.5 21.5 11 Time (Q-c), s 8.1 24.0 23.5 7.6 13.2 9.7 11 (Q-c), s 3.1 0.0 0.0 0.0 2.0 14.0 11 (Delay) 49.3	LnGrp LOS	С	П	П	Е	Α	Α	т	С		С	С	0
h 762 33,9 448 E C D E C D (b), s 30,7 27,0 26,0 11,0 19,7 53,0 1,0 1,0 1,0 1,0 1,0 1,0 1,0 1,0 1,0 1	Approach Vol, veh/h		928			1116			302			417	
E C D 1 2 3 4 5 6 7 8 2 3 4 5 6 8 8 0, s 30,7 27,0 26,0 11,0 19,7 53,0 9),s 4.5 4.5 4.5 4.5 4.5 10xx), s 32.5 22.5 21.5 6.5 21.5 48.5 10xx), s 8.1 240 23.5 7.6 13.2 9.7 10x 49.3	Approach Delay, s/veh		76.2			33.9			44.8			33.8	
1 2 3 4 5 6 7 2 3 4 5 6 30,7 27,0 26,0 11,0 19,7 3),s 4.5 4.5 4.5 4.5 4.5 4.5 max),s 33.5 225 21.5 6.5 21.5 c+11),s 8.1 240 23.5 7.6 13.2 t 49,3	Approach LOS		ш			С			D			C	
2 3 4 5 6 2 30.7 27.0 26.0 119.7 27.0 4.5 4.5 4.5 4.5 27.0 21.5 22.5 21.5 6.5 21.5 27.1 24.0 23.5 7.6 13.2 28.1 24.0 23.5 7.6 13.2 28.1 24.0 23.5 7.6 13.2 29.2 3.1 0.0 0.0 0.0 2.0	Timer	_	2	ω	4	5	6	7	ω				
(c), s 30.7 27.0 26.0 11.0 19.7 (s), s 4.5 4.5 4.5 4.5 (s), s 32.5 22.5 21.5 6.5 21.5 (c.+11), s 8.1 24.0 23.5 7.6 13.2 (s), s 3.1 0.0 0.0 0.0 2.0 (49.3)	Assigned Phs		2	3	4	5	6		8				
), s 4.5 4.5 4.5 4.5 (5.5 21.5 (6.5	Phs Duration (G+Y+Rc), s		30.7	27.0	26.0	11.0	19.7		53.0				
imax), s 32.5 22.5 21.5 6.5 21.5 c-t1), s 8.1 24.0 23.5 7.6 13.2 c-t1), s 3.1 0.0 0.0 0.0 2.0 49.3	Change Period (Y+Rc), s		4.5	4.5	4.5	4.5	4.5		4.5				
_c+I)), s	Max Green Setting (Gmax), s		32.5	22.5	21.5	6.5	21.5		48.5				
49.3	Max Q Clear Time (g_c+l1), s		8.1	24.0	23.5	7.6	13.2		9.7				
	Green Ext Time (p_c), s		<u>ω</u>	0.0	0.0	0.0	2.0		14.0				
	Intersection Summary												
	HCM 2010 Ctrl Delay			49.3									

Synchro 9 Report 6/10/2016	

Tumwater Transportation Master Plan SCJ Alliance

HCM 2010 TWSC 28: Trosper Rd & Rural Rd

Existing 2015
PM Peak Hour

Int Delay, s/veh 3.2	2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	35	175	295	100	90	60
uture Vol, veh/h	35	175	295	100	90	60
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
/eh in Median Storage, #		0	0		0	
Grade, %	,	0	0		0	
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0		_	2	2
/wmt Flow	38	190	321	109	98	65
//dajor/Minor	Major1		Major2		Minor2	
Conflicting Flow All	429	0		0	641	375
Stage 1		,			375	
Stage 2		,			266	
Critical Hdwy	4.1	í			6.42	6.22
Critical Hdwy Stg 1					5.42	
Critical Hdwy Stg 2					5.42	
ollow-up Hdwy	2.2				3.518	3.318
ot Cap-1 Maneuver	1141	,			439	671
Stage 1		,			695	
Stage 2		í			779	·
Platoon blocked, %						
Mov Cap-1 Maneuver	1141	í			423	671
Mov Cap-2 Maneuver					423	
Stage 1		í			695	
Stage 2					750	
Approach	EB		WB		SB	
HCM Control Delay, s	1.4		0		14	
HCM LOS					В	
// vinor Lane/Major Mvmt	EBL	EBT	WBT WBR SBLn1 SBLn2			
Capacity (veh/h)	1141		423 671			
HCM Lane V/C Ratio	0.033		0			
JOM Control Delay (s)	8.3	0				
TOWN COLLEGE POINTS (2)		Þ	. С В			
HCM Lane LOS	А					

Tumwater Transportation Master Plan SCJ Alliance

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

Existing 2015
PM Peak Hour

											ncoordinated	Control Type: Actuated-Uncoordinated
												Actuated Cycle Length: 45
												Cycle Length: 60
											Other	Area Type:
												Intersection Summary
	Max	Max		Max	Max	None	None	None		None	None	Recall Mode
						Yes	Yes	Yes		Yes	Yes	Lead-Lag Optimize?
						Lag	Lag	Lead		Lag	Lead	Lead/Lag
	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	Total Lost Time (s)
	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	Lost Time Adjust (s)
	1.0	1.0		1.0	1.0	1.0	1.0	1.0		1.0	1.0	All-Red Time (s)
	3.5	3.5		3.5	3.5	3.5	3.5	3.5		3.5	3.5	Yellow Time (s)
	39.2%	39.2%		39.2%	39.2%	45.0%	45.0%	15.8%		45.0%	15.8%	Total Split (%)
	23.5	23.5		23.5	23.5	27.0	27.0	9.5		27.0	9.5	Total Split (s)
	21.5	21.5		21.5	21.5	26.5	26.5	9.5		26.5	9.5	Minimum Split (s)
	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	Minimum Initial (s)
												Switch Phase
	6	6		2	2	00	00	ω		4	7	Detector Phase
		6			2	00		00			4	Permitted Phases
	6			2			00	ω		4	7	Protected Phases
	NA	Perm		NA	Perm	Perm	NA	pm+pt		NA	pm+pt	Turn Type
												Shared Lane Traffic (%)
0%	0%	0%	0%	0%	0%	1%	1%	1%	1%	1%	1%	Heavy Vehicles (%)
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
	13.3			6.1			14.8			45.7		Travel Time (s)
	583			269			652			2012		Link Distance (ft)
	30			30			30			30		Link Speed (mph)
Yes			Yes			Yes			Yes			Right Turn on Red
		25			25			25			25	Taper Length (ft)
0		_	0		_	_		_	_			Storage Lanes
0		125	0		100	0		225	150		125	Storage Length (ft)
1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	Ideal Flow (vphpl)
15	20	40	55	25	60	50	370	50	45	250	10	Future Volume (vph)
15	20	40	55	25	60	50	370	50	45	250	10	Traffic Volume (vph)
	¥	_#		₩	_#	٦,	→	_#		→	J,	Lane Configurations
SBR	SBT	SBL	NBR	NBT	NBL	WBR	WBT	WBL	EBR	EBT	EBL	Lane Group
*	+	*	•	_	و	1	1	•	1	ţ	\	
_	-	-	,	•		•	١		'		•	

Splits and Phases: 29: Lake Park Dr & Trosper Rd

↑ Ø2	▼ Ø3	- D4
23.5 s	9.5s	27 s
₩ 206	→ Ø7	♦
23.5 s	9.5s	27 s

Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

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

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	JI,	⇟		J,	→	-1	J,	¥		Ħ	₽÷	
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	ω	8	18	5	2	12	_	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1900	1881	1881	1881	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	=	263	47	53	389	53	63	26	58	42	21	16
Adj No. of Lanes	_	2	0	_	_	_	_	_	0	_	_	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
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
Grp Volume(v), veh/h	1	153	157	53	389	53	63	0	84	42	0	37
Grp Sat Flow(s),veh/h/ln	1792	1787	1787	1792	1881	1599	1393	0	1694	1335	0	1765
Q Serve(g_s), s	0.2	ω ω	3.4	1.0	8.6	: ::	1.4	0.0	1.5	1.0	0.0	0.6
Cycle Q Clear(g_c), s	0.2	ω ω	3.4	1.0	8.6	=======================================	2.0	0.0	1.5	2.4	0.0	0.6
Prop In Lane	1.00		0.30	1.00	1	1.00	1.00	,	0.69	1.00		0.43
Lane Grp Cap(c), ven/n	289	466	465	451	563	4/9	693	800	080	646	8 0	20/2
Avail Can(c a) weh/h	452	849	849	545	894	760	60.0	0.00	680	646	0 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
Upstream Filter(I)	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
Incr Delay (d2), 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(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	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	В	В	В	В	В	В	A		Α	Α		A
Approach Vol, veh/h		321			495			147			79	
Approach Delay, s/veh		14.5			15.3			9.4			9.4	
Approach LOS		В			В			Þ			Α	
Timer		2	ယ	4	5	6	7	8				
Assigned Phs		2	ω	4		6	7	8				
Phs Duration (G+Y+Rc), s		23.5	7.0	16.8		23.5	5.2	18.7				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		19.0	5.0	22.5		19.0	5.0	22.5				
Max Q Clear Time (g_c+l1), s		4.0	3.0	5.4		4.4	2.2	10.6				
Green Ext Time (p_c), s		0.8	0.0	4.2		0.8	0.0	3.5				
Intersection Summary												
HCM 2010 Ctrl Delay			13.8									
HCM 2010 LOS			В									

Tumwater Transportation Master Plan SCJ Alliance

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

Existing 2015
PM Peak Hour

		٠	•								
EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
JI.	*		_#	\$ ₽		_#	→	74	H	↑	
40	265	110	370	295	30	185	215	395	100	235	45
40	265	110	370	295	30	185	215	395	100	235	45
1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
100		0	150		0	250		0	150		250
_		0	_		0	_		_	2		0
25			25			25			25		
		Yes			Yes			Yes			Yes
	30			30			30			30	
	652			520			896			1861	
	14.8			11.8			20.4			42.3	
0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
			38%								
Split	NA		Split	NA		Prot	NA	om+ov	Prot	NA	
4	4		œ	œ		5	2	00	_	6	
								2			
4	4		00	œ		5	2	00	_	6	
4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
35.6	35.6		33.6	33.6		24.5	30.6	33.6	8.6	31.6	
36.0	36.0		37.0	37.0		29.0	42.0	37.0	20.0	33.0	
26.7%	26.7%			27.4%				27.4%		24.4%	
3.6	3.6		3.6	3.6		3.6	3.6	3.6	3.6	3.6	
1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	
0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
4.6	4.6		4.6	4.6		4.6	4.6	4.6	4.6	4.6	
						Lead	Lag		Lead	Lag	
						Yes	Yes		Yes	Yes	
Max	Max			C-Max		Max		C-Max	None	Max	
Other											
d to phase	8:WBTL,	Start of R	ed								
dinated											
	Jane Group Lane Configurations Traffic Volume (vph) 40 Traffic Volume (vph) 40 Traffic Volume (vph) 40 Storage Length (ft) 100 Storage Length (ft) 100 Storage Length (ft) Taper Length (ft) 100 Storage Length (ft) 100 Stared Lane Traffic (%) Peak Hour Factor 100 Split (%) 100 Split (%) 100 Total Split (%	EBI EBT ↑↑↑↑ 40 265 40 265 1900 1900 100 100 100 100 100 100 100 100 100	FBT EBR 10 2.65 110 2.65 110 2.65 110 2.65 110 0 1900 1900 0 0 148 8 0.98 6 19% 19% 19% 19% 19% 19% 19% 19% 19% 19%	FBT FBR WBI T	FBT EBR WBL V 1 1-1	FBT FBR WBL WBT WBR 1 110 370 295 30 265 1110 370 295 30 0 265 110 370 295 0 1900 1900 1900 1900 0 150 0 0 150 0 0 1 10 0 0 1 10 0 0 1 18 118 118 3 0,98 0,98 0,98 0,98 0,98 6 11% 11% 11% 11% 11% 11% 6 11% 1 9 11% 11% 11% 1 NA Split NA 8 8 1 NA Split NA 4 8 8 8 1 A 4 4 8 8 1 A 4 4 8 8 1 A 4 4 8 8 1 A 4 4 8 8 1 A 4 4 8 8 1 A 4 4 8 8 1 A 4 4 8 8 1 A 4 4 8 8 1 A 4 4 8 8 1 A 4 4 8 1 A 4 8	FBT FBR WBL WBT WBR NBL WBT WBR WBL WBT WBT WBR WBT WBT	FBT FBR WBL WBT WBR NB NBT NBT	EBT EBR WB WBT WBR NBL NBT	FBT FBR WBL WBT WBR NBL NBT NBR SBL NBT NBT	FBT EBR WBI WBI WBR NBL NBT NBR SBI 1 ↑↑ ↑

Splits and Phases: 30: Littlerock Rd/2nd Ave & Trosper Rd

Ø1	▶ 102	→ _{Ø4}	₹ 708 (R)
20 s	42 s	36 s	37 s
<u></u> Ø5	₩ 266		
s 62	20.		

Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

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

Existing 2015
PM Peak Hour

	-	ţ.	4	\	†	<i>></i>	۶	-	•	•	←	•
vement	EBE	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
ne Configurations	ĸ	⇟		æ	♣		æ	→	-34	ж	₹	
affic Volume (veh/h)	40.	265	110	370	295	3 33	185	215	395	100	235	45
umber	7	4	14	ω č	8	ಹ 8	5 5	2	12	_ 5	6	16
tial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
ed-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
rking 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
j Sat Flow, veh/h/ln	1881	1881	1900	1881	1881	1900	1881	1881	1881	1881	1881	1900
j Flow Rate, veh/h	41	270	51	237	499	<u>س</u>	189	219	286	102	240	46
ak Hour Factor	0 98 -	0 0 0	0 98	o 98 -	0 98 2) 98 c	0 98 -	0 98 -	0 98 -	0 98 -	0 2	0 98
ercent Heavy Veh, %								1				
ap, veh/h	417	700	130	430	842	52	324	604	897	126	632	119
rive On Green	0.23	0.23	0.23	0.40	0.40	0.40	0.18	0.32	0.32	0.07	0.21	0.21
at Flow, veh/h	1792	3009	560	1792	3507	217	1792	1881	1599	1792	3002	566
p Volume(v), veh/h	41	159	162	237	267	263	189	219	286	1702	141	145
Serve(a_s), 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
/cle Q Clear(g_c), 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
op In Lane	1.00		0.31	1.00		0.12	1.00		1.00	1.00		0.32
ine Grp Cap(c), veh/h	417	416	415	430	451	442	324	604	897	126	376	375
C Ratio(X)	417	0.38	0.39	430	0.59 451	0.59	324	604	897	20.81	376	375
CM 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
ostream Filter(I)	0.97	0.97	0.97	0.87	0.87	0.87	0.91	0.91	0.91	1.00	1.00	1.00
niform 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
or Delay (d2), 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
ile RackOfO(50%) veh/in	1 0.0	5 C	5.0	7.3	8 0.0	8 C	7.1	6.5	9.0	4.0	4.0	4.9
nGrp Delay(d),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
Grp LOS	D	D	D	D	D	D	Е	D	В	Е	D	D
proach Vol, veh/h		362			767			694			388	
proach Delay, s/veh		45.7			39.9			34.1			55.2	
proach LOS		D			D			С			ш	
mer	_	2	ω	4	5	6	7	8				
signed Phs	_	2		4	5	6		œ				
ns Duration (G+Y+Rc), s	14.1	47.9		36.0	29.0	33.0		37.0				
nange Period (Y+Rc), s	4.6	4.6		4.6	4.6	4.6		4.6				
ax Green Setting (Gmax), s	15.4	37.4		31.4	24.4	28.4		32.4				
ax U Clear Time (g_c+l1), s	9.6	3.9		12.4	0.0	30		بر بر بر				
(T ->)	9	i		į				1				
ersection Summary												
CM 2010 Ctrl Delay			41.7									
CM 2010 LOS			D									
ites												

No. 10 Character Approximate A

Turnwater Transportation Master Plan SCJ Alliance

Lanes, Volumes, Timings
31: Tyee Dr/l-5 SB Ramps & Trosper Rd

Existing 2015
PM Peak Hour

											Other	Area Type:
												Intersection Summary
Max	Max	Max		Max	Max		C-Max	None	C-Max	C-Max	None	Recall Mode
							Yes	Yes	Yes	Yes	Yes	Lead-Lag Optimize?
							Lag	Lead	Lag	Lag	Lead	Lead/Lag
4.6	4.6	4.6		4.6	4.6		4.6	4.6	4.6	4.6	4.6	Total Lost Time (s)
0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	Lost Time Adjust (s)
1.0	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	All-Red Time (s)
3.6	3.6	3.6		3.6	3.6		3.6	3.6	3.6	3.6	3.6	Yellow Time (s)
30.4%	30.4%	30.4%		17.8%	17.8%		33.0%	23.7%	28.1%	28.1%	18.9%	Total Split (%)
41.0	41.0	41.0		24.0	24.0		44.5	32.0	38.0	38.0	25.5	Total Split (s)
36.6	36.6	36.6		20.5	20.5		29.6	8.6	33.6	33.6	8.6	Minimum Split (s)
4.0	4.0	4.0		4.0	4.0		10.0	4.0	10.0	10.0	4.0	Minimum Initial (s)
												Switch Phase
6	6	6	23	2	2		œ	ω	4	4	7	Detector Phase
6									4			Permitted Phases
	6	6	23	2	2		00	ω		4	7	Protected Phases
Perm	NA	Split	pt+ov	NA	Split		NA	Prot	Perm	NA	Prot	Turn Type
												Shared Lane Traffic (%)
1%	1%	1%	2%	2%	2%	1%	1%	1%	1%	1%	1%	Heavy Vehicles (%)
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
	21.6			18.9			20.1			11.8		Travel Time (s)
	952			832			883			520		Link Distance (ft)
	30			30			30			30		Link Speed (mph)
Yes			Yes			Yes			Yes			Right Turn on Red
		25			25			25			25	Taper Length (ft)
_		_	_		_	0		_	_		_	Storage Lanes
400		400	125		75	0		275	100		200	Storage Length (ft)
1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	Ideal Flow (vphpl)
375	325	460	335	160	25	190	320	245	20	540	155	Future Volume (vph)
375	325	460	335	160	25	190	320	245	20	540	155	Traffic Volume (vph)
74	→	# #	74	→	J		→	J,	- 4	*	_#	Lane Configurations
SBR	SBT	SBL	NBR	NBT	NBL	WBR	WBT	WBL	EBR	EBT	EBL	Lane Group
*	+	•	*	→	٠	1	t	4	1	ļ	,	
	-	-		•		•						

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

Area Type: Other
Cycle Length: 135
Actuated Cycle Length: 135
Offiset: 46 (34%), Referenced to phase 4:EBT and 8:WBT, Start of Red
Natural Cycle: 110
Control Type: Actuated-Coordinated

₹102 906 **₹ ↑** Ø8 (R) ₩04 (R)

Tumwater Transportation Master Plan SCJ Alliance

HCM 2010 Signalized Intersection Summary 31: Tyee Dr/I-5 SB Ramps & Trosper Rd

Existing 2015
PM Peak Hour

HCM 2010 LOS	HCM 2010 Ctrl Delay	ntersection Summary		+I1), s 2		Change Period (Y+Rc), s	01		imer 1	Approach LOS	y, s/veh		Е	68.7	/ln 6.7	nitial O Delay(d3) s/yeh 0.0 (en 52.6	0.89	lo 2.00	a), veh/h 277	0.87	p(c), veh/h	1.00	_c), s 11.9	11.9	Grp Volume(v), ven/h 163 568 Grp Sat Flow(s), veh/h/ln 1792 1787	1792	ireen 0.21	Cap. veh/h 187 1046	Percent Heavy Veh % 1 1	0 05 1	eh/h 163	n 1881	1.00	bT) 1.0	nitial Q (Qb), veh 0	7	155	_ane Configurations	EBL	\
			0.0		19.4	4.6		2		С	33.8	752	С	24.3	6.6	000	1.8					46		13.0					46			568	1881	1.00		0	4	540	540	EBT	*
D	44.9		0.5	20.9	27.4	4.6	25.9	ω	ω				С	20.1	0.4	0.0	20.0	0.89	2.00	468	0.04	468	1.00	0.8	0.8	1599	1599	0.59	468	1 2	005	21	1881	1.00	1.00	0	14	20	20 -	EBR	4
			5.6	15.0	33.4	4.6	44.1	4	4				ш	69.4	10.9	0.0	48.8 20.6	0.85	1.67	364	0.91	283	1.00	18.9	18.9	1792	1792	0.26	283	1	S _	258	1881	1.00	1.00	0	ω	245	245	WBL	1
									5	D	41.7	595	C	20.4	3.2	0.5	0.0	0.85	1.67	1237	0.27	1237		6.4	6.4	1787	3668	0.58	1237	1	0 05	337	1881	1.00		0	00	320	320	WBT	1
			ယ	27.9	36.4	4.6	41.0	6	6					0.0	0.0	0.0	0.0	0.00	1.67	0	0.00	0	0.00	0.0	0.0	0 0	0	0.00	0 -	1	9 0	0	1900	1.00	1.00	0	18	190	190	WBR	1
			0.2	13.9	20.9	4.6	18.7	7	7				D	51.0	0.9	0.0	2.00	1.00	1.00	255	0.10	255	1.00	1.7	1.7	26 1774	1774	0.14	255	د	0 7	26	1863	1.00	1.00	0	5	25	25 -	NBL	و
			6.6	8.4	39.9	4.6	51.3	00	œ	D	53.2	494	т	65.1	6.7	00.7	10.7	1.00	1.00	268	0.63	268		11.5	11.5	1863	1863	0.14	268	٥.,	005 1	168	1863	1.00		0	2	160	160	NBT	-
													D	46.8	10.4	000	40.6	1.00	1.00	477	0.63	477	1.00	19.4	19.4	1583	1583	0.14	477	ر د	S	300	1863	1.00	1.00	0	12	335	335 -	NBR	•
													D	54.3	9.1	0.7	80	1.00	1.00	628	0.77	628	1.00	25.9	25.9	484 1165	2329	0.27	628	2 2	0 05	484	1881	1.00	1.00	0	_	460	460 1	SBL	*
										D	51.7	905	D	51.0	12.4	0.0	7.0	1.00	1.00	507	0.67	507		21.9	21.9	1881	1881	0.27	507	1	9 -	342	1881	1.00		0	6	325	325 -	SBT	+
													D	38.8	2.4	0.0	3/.9	1.00	1.00	431	0.18	431	1.00	5.1	5.1	1599	1599	0.27	431	2.73	0 05 1	79	1881	1.00	1.00	0	16	375	375	SBR	*

Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

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

Existing 2015
PM Peak Hour

ande Comigulations Traffic Volume (vph) 0 Tuture Volume (vph) 0 Storage Length (ft) 300 Storage Length (ft) 25 Storage Length (ft) 25 Storage Length (ft) 25 Taper Length	ane Group EB
815 815 1900 30 30 883 20.1 1% NA	BT ↓
525 525 1900 0 0 0 Yes 7%	BR ✓
0 0 1900 0 0 25 25	WBL
590 590 1900 1900 30 397 9.0 0.93 1%	WBT
615 615 1900 0 0 0 Ves	WBR
170 170 170 1900 1900 1900 1900 Prot 5	NBL2
0 0 1900 0 1 1 25 25 30 785 17.8 0.93 1%	NBL 🌁
80 80 80 1900 200 1 1 Yes Prot 5	NBR
0 1900 0 0 0 25 25 30 593 13.5 0.93	SE ₹
0 1900 0 0 0 0,93	SER V

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

The same of the sa	5	
	→ Ø4 (R)	
	8 96	
* 05	↑ Ø8 (R)	
39 s	96 s	

Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

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

Existing 2015
PM Peak Hour

	W	ţ	4	^	Ť	۲	٠	×	*	₹	~	
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL2	NBL	NBR	SEL	SER	
Lane Configurations		↑			∌		_#		-34			
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	ω	000	78	О	ப	12			
Initial Q (Qb), veh	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			
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/h/ln	0	1881	1900	0	1881	1900	1881	1881	1881			
Adj Flow Rate, veh/h	0	876	0	0	634	0	183	183	0			
Adj No. of Lanes	0	ω	0	0	2	0	_	_	_			
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	_	_	0	_	_	_	_	_			
Cap, veh/h	0	4186	0	0	2913	0	209	209	187			
Arrive On Green	0.00	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/h/ln	0	1712	0	0	1787	0	1792	1792	1599			
U Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	13.6	13.6	0.0			
Pron In I ane	000	ċ	0.00	000	0	000	100	100	100			
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(I)	0.00	0.70	0.00	0.00	0.61	0.00	1.00	1.00	0.00			
Incr Delay (d2) s/veh	0.0	0.0	0.0	0.0	0.0	0.0	20.0	0.00	0.0			
Initial Q Delav(d3).s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	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		Þ			Þ		m	ш				
Approach Vol, veh/h		876			634		183	183				
Approach Delay, s/veh		0.1			0.1		63.1	63.1				
Approach LOS		A			Þ		Е	ш				
Timer	_	2	ω	4	5	6	7	00				
Assigned Phs		2		4				00				
Phs 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 Q Clear Time (g_c+l1), 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			Þ									

Tumwater Transportation Master Plan SCJ Alliance

Lanes, Volumes, Timings 33: Capitol Blvd & Trosper Rd

Existing 2015
PM Peak Hour

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lane Groun	FRI	FRT	FBR .	WRI .	WRT	WRR	NR .	NRT .	NBR	£	SRT .	SRR
Lane Configurations	J,	2,	٦,	J,	₩		ı	\$÷		J.	⇉	-4
Traffic Volume (vph)	280	45	580	30	70	35	770	575	10	15	465	350
Future Volume (vph)	280	45	580	30	70	35	770	575	10	15	465	350
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	50		0	250		0	100		200
Storage Lanes	_		_	_		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)		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
Protected Phases	4	4	2	00	00		2	2		6	6	
Permitted Phases			4									6
Detector Phase	4	4	2	00	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	6.0	6.0	6.0		6.0	6.0		6.0	6.0	6.0
Minimum Split (s)	20.6	20.6	29.6	28.6	28.6		29.6	29.6		34.6	34.6	34.6
Total Split (s)	20.6	20.6	51.2	28.6	28.6			51.2		34.6	34.6	34.6
Total Split (%)	15.3%	15.3%	37.9%	21.2%	21.2%			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
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 Optimize?												
Recall Mode	None	None	C-Min	None	None		C-Min	C-Min		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	to phase 2:	NBTL, Si	tart of Red									
Natural Cycle: 145	:											
Control Type: Actuated-Coordinated	rdinated											

Splits and Phases: 33: Capitol Blvd & Trosper Rd

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51.2 s	34.6 s	20.6 s	28.6 s

Tumwater Transportation Master Plan
Synchro 9 Report
SCJ Alliance
6/10/2016

HCM 2010 Signalized Intersection Summary 33: Capitol Blvd & Trosper Rd

Existing 2015
PM Peak Hour

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Movement	ЕВЕ	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBF
Lane Configurations	_#	2 →	-34	_#	ಘ		_74	\$÷		_3(⇉	_,
Traffic Volume (veh/h)	280	45	580	30	70	35	770	575	10	15	465	350
Future Volume (veh/h)	280	. 45	580	38	70	: 당	770	575	10	15	465	350
Number	7	4	14	ω	8	18	σ ₁	2	12	_	6	16
Initial Q (Qb), veh	300	0	200	3 0	0	3 0	300	0	300	80	0	30
Poding Ris Adi	100	3	100	3 .	3	3 .	1 .00	3	3 .	1.00	3	1
Adi Sat Flow veh/h/ln	1881	1881	1881	1900	1900	1900	1881	1881	1900	1881	1881	1881
Adi Flow Rate, veh/h	315	0	359	30	71	ය ස	456	1031	10	15	470	
Adj No. of Lanes	2	0		_		0	_	2	0	_ ;	2	
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, %	_	_	_	0	0	0	_	_	_	_	_	
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
Grp Volume(v), veh/h	315	0	359	30	0	106	456	521	520	15	470	_
Grp Sat Flow(s),veh/h/ln	1792	0	1599	1810	0	1795	1792	1881	1875	1792	1787	1599
Q Serve(g_s), s	11.8	0.0	13.0	2 12	0.0	7.8	15.9	1 2 2	18.1	1.0	17.3	0.0
Pron In I ane	100	c c	100	100	ċ	0 33	100	ç	0.00	100		100
Lane Grp Cap(c), veh/h	403	0	1015	134	0	133	936	982	979	277	553	248
V/C 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
Avail Cap(c_a), veh/h	425	0	1025	322	0	319	936	982	979	398	794	355
Horream Filter(I)	0.33	0.33	0.33	1.0	0.00	1.00	0.86	0.86	0.86	0.55	Э . Я	000
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 BackOfQ(50%),veh/ln	6.3	0.0	13.5	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
Chicip COO	_	171	c	-	10/	г	c	1 107	c	-	ר ה	
Approach Delay, s/yeh		39 6			64 1			1497			57 7	
Approach LOS		D			П			В			П	
Timer	_	2	ယ	4	ഗ	6	7	<u></u>				
Assigned Phs		2		4		6		∞				
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 U Clear Time (g_c+II), S		20.1		15.0		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									
10M 2010 10C												

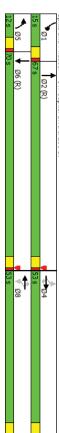
Tumwater Transportation Master Plan SCJ Alliance

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		2>	-14		2÷,	-34	_#	≯		_#	≯	
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		125	0		100	250		0	200		0
Storage Lanes	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)		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	
Protected Phases		4			00		5	2		_	6	
Permitted Phases	4		4	00		00						
Detector Phase	4	4	4	00	00	00	5	2		_	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 Split (s)	29.0	29.0	29.0	30.0	30.0	30.0	11.0	25.0		11.0	25.0	
Total Split (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	
Total Lost Time (s)		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	ced to phase	e 2:NBT a	and 6:SB	T, Start o	Red							
Natural Cycle: 70												
Control Type: Actuated Coordinated												

Splits and Phases: 34: Capitol Blvd & Lee St



Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

HCM Signalized Intersection Capacity Analysis 34: Capitol Blvd & Lee St

Existing 2015
PM Peak Hour

Movement Lane Configurations Traffic Volume (vph)	EBL 260	5 4	EBR 40	WBL	5 4	WBR 80	NBL 25	NBT 1025	NBR 20	SBL SBL	SBT ↑ 815	SBR 150
Future Volume (vph)	260	ഗ ഗ	40	ਤੇ <u>ਤ</u>	თ თ	8 8 8	25	1025	20 20	50 5	815 5	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	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Fr.		1.00	0.85		1.00	0.85	1.00	1.00		1.00	0.98	
Fit Protected		0.95	1.00		0.96	1.00	0.95	7.00		0.95	3.00	
Elt Permitted		0 71	100		0.74	100	0 95	100		0.95	100	
Satd. Flow (perm)		1344	1599		1414	1615	1787	3564		1787	3491	
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	Сī	86	27	1102	22	54	876	161
RTOR Reduction (vph)	0	0	32	0	0	65	0	2 -	0	0	000	
Lane Group Flow (vpn)	1%	1%	1% =	0%0	0% 	0%	1%	1%	1% 0	1%	1%	
Turn Type	Perm	NA S	Perm	Perm	NA	Perm	Prot	NA S	- 70	Prot	NA S	
Protected Phases		4			œ		5	2		_	6	
Permitted Phases	4		4	œ		00						
Actuated Green, G (s)		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	4.3	80.4		7.2	83.3	
Clearance Time (s)		0.2.0	0.2.0		7.6	0.2.0	0.00	0.00		0.00	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)		334	397		351	401	56	2122		95	2154	
v/s Ratio Prot							0.02	c0.32		c0.03	c0.29	
v/s Ratio Perm		c0.21	0.01		0.01	0.01						
v/c Ratio		0.85	0.03		0.06	0.05	0.48	0.53		0.57	0.48	
Uniform Delay, d1		48.3	38.3		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		0.83	0.98	
Delay (s)		66.3	38 O.O		38.7	38.6	66.6	171		55 9 9	14.3	
Level of Service		т	0		D	0	т	В		ш	Φ.	
Approach Delay (s)		62.7			38.6			18.2			16.4	
Approach LOS		ш			D			В			В	
Intersection Summary												
HCM 2000 Control Delay			23.7	H	HCM 2000 Level of Service	Level of S	service		С			
HCM 2000 Volume to Capacity ratio	/ ratio		0.62									
Actuated Cycle Length (s)			135.0	SL	Sum of lost time (s)	time (s)			13.8			
Intersection Capacity Utilization	ם		66.8%	c	ICU Level of Service	Service			С			
Analysis Period (min)			5									

Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 2/9/2016

Lanes, Volumes, Timings
35: Littlerock Rd & Fred Meyer/Costco Drwy

DM Do	Existing
ak Hour	2015

1.0 0.0 4.0 Lag Yes Max	1.0 0.0 4.0 Lead Yes None		1.0 0.0 4.0 Lag Yes Max	1.0 0.0 4.0 Lead Yes None	1.0 0.0 4.0 Lead Yes None	1.0 0.0 4.0 None	1.0 None	1.0 0.0 4.0 None	1.0 0.0 4.0 None	None Other	All-Red Time (s) All-Red Time (s) Lost Time Adjust (s) Total Lost Time (s) Lead/Lag Optimize? Recall Mode None Intersection Summary Area Type: Cycle Length: 50 Actuated Cycle Length: 42.1 Natural Cycle: 50 Control Type: Actuated-Uncoordinated
NA 6 6 5.0 20.0 21.0 42.0%			NA 2 2 5.0 20.0 40.0%	Prot 5 5 5 9.0 9.0 9.0 18.0%	pm+ov 1 8 8 1 1 5.0 9.0 10.0 20.0%	NA 8 8 8 5.0 20.0 40.0%	Perm 8 8 8 5.0 20.0 20.0 40.0%	Perm 4 4 5.0 20.0 40.0%	5.0 20.0 40.0%	4 4 5.0 20.0 20.0%	Shared Lane Irattic (%) Turn Type Protected Phases Permitted Phases Detector Phase Switch Phase Switch Phase Minimum Initial (s) Minimum Split (s) Total Split (%) Total Split (%)
30 896 20.4 0.95 0.95 1% 1%	0.95	0.95	30 713 16.2 0.95 1%	0.95	0.95	30 426 9.7 0.95 1%	0.95	0.95	30 390 8.9 0.95	0.95	Link Speed (mph) Link Distance (ft) Link Distance (ft) Travel Time (s) Peak Hour Factor Heavy Vehicles (%)
585 0 585 0 1900 1900 0 7es	105 105 1900 175 1	95 95 1900 0 0 Yes	650 650 1900	0 0 1900 100 1 25	115 115 1900 1 1 Yes	1900	130 130 1900 0 0 25	0 1900 1 1 1	1900	1900 0 0 0 0 25	Traffic Volume (vph) Future Volume (vph) Ideal Flow (vphp) Storage Length (ft) Storage Langth (ft) Taper Length (ft) Right Turn on Red
SBT S	₩ SBL	NBR	NBT →	ME 🗡	WBR /	WBT T	WBL	₩		EBL 🔽	Lane Group

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



Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

HCM 2010 Signalized Intersection Summary 35: Littlerock Rd & Fred Meyer/Costco Drwy

Existing 2015
PM Peak Hour

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		2,	-4		2 .,	٦,	_#	∌		J,	→	
Traffic Volume (veh/h)	0	0.	0	130	σ.	115	0,	650	95	105	585	0
Future Volume (veh/h)	0	0	0	130	57	115	0	650	95	105	585	0
Number	7	4	14	ω	8	18	5	2	12	_	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1881	1881	1881	1881	1900	1881	1881	1900
Adj Flow Rate, veh/h	0	0	0	137	5	121	0	684	100	11	616	0
Adj No. of Lanes	0	_	_	0	_	_	_	2	0	_	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	_	_	_	_	_	_	_	_	_
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
Grp Volume(v), veh/h	0	0	0	142	0	121	0	390	394	111	616	0
Grp Sat Flow(s),veh/h/ln	0	1900	1615	1438	0	1599	1792	1787	1800	1792	1787	0
Q Serve(g_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		0.25	1.00		0.00
Lane Grp Cap(c), veh/h	0	285	243	407	0	387	57	774	780	550	2263	0
V/C Ratio(X)	0.00	0.00	0.00	0.35	0.00	0.31	0.00	0.50	0.51	0.20	0.27	0.00
Avail Cap(c_a), ven/n	3 0	1 00	100	3 14	300	1 20	1 00	100	1 /80	100	1 00	3
Upstream Filter(I)	0.00	0.00	0.00	1 .00	0.00	1 .00	0.00	1.00	1.00	1.00	1.00	000
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
Incr 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 BackOfQ(50%),veh/ln	0.0	0.0	0.0	1.4	0.0	1.0	0.0	ω ω	ယ	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	ω ω	0.0
LnGrp LOS				В		В		Þ	Þ	Þ	Þ	
Approach Vol, veh/h		0			263			784			727	
Approach Delay, s/veh		0.0			13.5			9.9			3.5	
Approach LOS					В			Þ			Þ	
Timer	_	2	ယ	4	5	6	7	8				
Assigned Phs	_	2		4	57	6		∞				
Phs 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 (g_c+l1), 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 Ctrl Delay			7.8									
HCM 2010 LOS			Α									

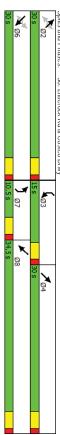
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Lanes, Volumes, Timings
36: Littlerock Rd & Costco Drwy

Existing 2015
PM Peak Hour

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Lane Group	SEL	SET	SER	NWL	TWN	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		2,	74		2,	74	J,	₩		JI.	→	
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		100	0		100	150		0	150		0
Storage Lanes	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)		325			806			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	
Protected Phases		6			2		7	4		ω	00	
Permitted Phases	6		6	2		2						
Detector Phase	6	6	6	2	2	2	7	4		ω	00	
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 Split (s)	30.0	30.0	30.0	30.0	30.0	30.0	9.5	30.0		9.5	30.0	
Total Split (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	
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	
Total Lost Time (s)		4.0	4.0		4.0	4.0	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	.4											
Natural Cycle: /5												
Control Type: Actuated-Uncoordinated	coordinated											

Splits and Phases: 36: Littlerock Rd & Costco Drwy



Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

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

TICINI 2000 Collinol Delay 21.2 TICINI 2000 Level of Service	22	mmany	В	14.7	B B B B D	(a) Delay, 02 0.9 0.0 1.4 0.4 6.2	1.00 1.00 1.00 1.00 1.00	14.0 13.0 14.5 13.6 31.3	0.20 0.01 0.28 0.13 0.55	n 0.08 0.00 c0.11 0.05	0.03	539 619 493 619 97	3.0 3.0 3.0 3.0	40 40 40 40 40 A0	(S) 26.1 26.1 26.1 26.1 3.7) 26.1 26.1 26.1 3.7	6 6 2	Phases 6 2 7	Perm NA Perm Perm NA Perm Prot	0% 0% 0% 0% 0% 1%	0 0 10 0 0 126 0	84 26 16 132 5 205 53	PHF 0.95 0.95 0.95 0.95 0.95 0.95		rot) 1830 1615 1813 1615 1/87	0.96 1.00 0.95 1.00 0.95	1.00 0.85 1.00 0.85 1.00	1.00 1.00 1.00 1.00 1.00	4.0 4.0 4.0 4.0	ph) 80 25 15 125 5 195 50	80 25 15 125 5 195 50	Pt 45 Pt	Movement SEL SET SER NWL NWT NWR NEL N	しんとうメスゴ
	Service		0	23.6	D C				0.55 0.61		C		3.0 3.0		0.05 0.28					1% 1%				1787 3484				1.00 0.95				44 4	NEL NET	∀
12.0 A	0																				00	105	0.95						1900	1000	100	•	. NER	1
			o l	23.2	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				0.79 0.36			_	3.0 3.0	40 40				ა 8	NA	1% 1% 1%		421		1787 3485					4.0 4.0	1000	400	44	SWL SWT SWR	K X X

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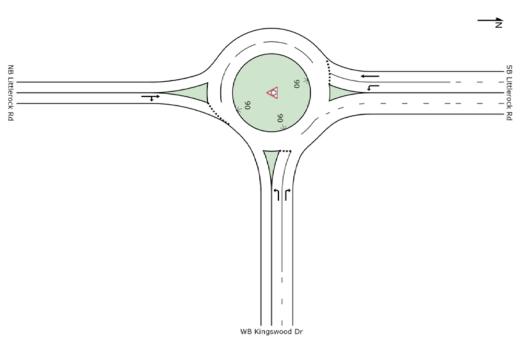
Synchro 9 Report 2/9/2016

Existing 2015
PM Peak Hour

SITE LAYOUT

♥ Site: 37) Littlerock Rd at Kingswood Dr

Existing 2015 PM Peak Hour Roundabout



MOVEMENT SUMMARY

Site: 37) Littlerock Rd at Kingswood Dr

Existing 2015 PM Peak Hour Roundabout

Movem	Movement Performance - Vehicles	ınce - Veh	icles								
Mov	OD	Demand Flows	lows	Deg.	Average	Level of	95% Back of Queue	Queue	Prop.	Effective	Average
ō					Delay				Queued	Stop Rate	Speed
										per veh	mph
South: N	South: NB Littlerock Rd										
00	T1	532	1.0	0.614	4.9	LOS A	5.4	136.6	0.38	0.44	36.5
18	R2	134	1.0	0.614	4.7	LOS A	5.4	136.6	0.38	0.44	35.5
Approach	_	667	1.0	0.614	4.8	LOS A	5.4	136.6	0.38	0.44	36.3
East WE	East WB Kingswood Dr	7									
_	2	194	1.0	0.198	12.3	LOS B	1.2	31.0	0.64	0.75	33.3
16	R2	81	1.0	0.049	4.2	LOS A	0.0	0.0	0.00	0.49	36.5
Approach	_	274	1.0	0.198	9.9	LOS A	1.2	31.0	0.45	0.67	34.2
North: SE	North: SB Littlerock Rd										
7	2	65	1.0	0.082	11.3	LOS B	0.4	10.7	0.44	0.65	33.8
4	Τ1	559	1.0	0.448	5.2	LOS A	3.5	89.2	0.53	0.52	36.0
Approach	_	624	1.0	0.448	5.8	LOS A	3.5	89.2	0.52	0.53	35.8
All Vehicles	les	1565	1.0	0.614	6.1	LOS A	5.4	136.6	0.45	0.52	35.7
of S	l evel of Service (LOS) Method: Delay & v/c (HCM 2010)	lethod: Del	2/v & v/c (HOM 2010)							

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 of will respective 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 M3D).

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

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Project N.Projectsio625 City of Turmwater0625.17 Turmwater Transportation Master Plan\Traffic\Operations\sidra 8001450, 6017802, SCJ ALLIANCE; PLUS / 1PC

SIDRA INTERSECTION 6

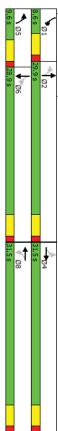
Lanes, Volumes, Timings 38: Capitol Blvd & X St

Existing 2015
PM Peak Hour

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	_#	₩		JI.	¥		JI.	→		H	₩	
Traffic Volume (vph)	20		15	10		20	20	905	10	35	710	35
Future Volume (vph)	20	_	15	10	_	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
Storage Lanes			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)		642			1326			1300			1368	
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+pt	NA		pm+pt	NA	
Protected Phases		4			00		5	2		_	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		00	00		5	2		_	6	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0		4.0	7.0			7.0	
Minimum Split (s)	31.5	31.5		31.5	31.5		9.5	25.5			26.5	
Total Split (s)	31.5	31.5		31.5	31.5		9.6	29.9			28.9	
Total Split (%)	45.0%	45.0%		45.0%	45.0%		13.7%	42.7%			41.3%	
Yellow Time (s)	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	
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	
Lead/Lag							Lead	Lag			Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Max		None	Max	
Intersection Summary												
Area Type:	Other											

Splits and Phases: 38: Capitol Blvd & X St

Cycle Length: 70
Actuated Cycle Length: 46.5
Natural Cycle: 70
Control Type: Actuated-Uncoordinated



Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

HCM 2010 Signalized Intersection Summary 38: Capitol Blvd & X St

Existing 2015
PM Peak Hour

Vovement	<u>Б</u>	EBT ↓	EBR ✓	WBL	WBT	WBR /	NBL 🅕	NBT →	NBR	SBL 🗸	SBT
Lane Configurations Traffic Volume (veh/h)	20_	⊸ ফ	15	76 7 8	- ₽	20	20 	905 2 05	10	33 _	
Future Volume (veh/h)	20		15	10	_	20	20	905	10	<u></u>	
Number	7	4	14	ω	00	18	5	2	12	_	
nitial Q (Qb), veh	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	
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/h/ln	1900	1900	1900	1900	1900	1900	1881	1881	1900	1881	
Adj Flow Rate, veh/h	22	_	17	11	_	22	22	1017	1	39	
Adj No. of Lanes	_	_	0	_	_	0	_	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	
Percent Heavy Veh, %	0	0	0	0	0	0	_	_	_	_	
Cap, veh/h	260	7	125	264	6	126	511	2092	23	453	
Arrive On Green	0.08	0.08	0.08	0.08	0.08	0.08	0.02	0.58	0.58	0.03	
Sat Flow, veh/h	1410	90	1538	1417	71	1555	1792	3622	39	1792	
Grp Volume(v), veh/h	22	0	18	=	0	23	22	502	526	39	
Grp Sat Flow(s),veh/h/ln	1410	0	1629	1417	0	1626	1792	1787	1874	1792	
Ω Serve(g_s), s	0.6	0.0	0.5	0.3	0.0	0.6	0.2	7.3	7.3	0.4	
Cycle Q Clear(g_c), s	1.2	0.0	0.5	0.8	0.0	0.6	0.2	7.3	7.3	0.4	
Prop In Lane	1.00		0.94	1.00		0.96	1.00		0.02	1.00	
Lane Grp Cap(c), veh/h	260	0	132	264	0	132	511	1032	1082	453	
VIC Ratio(X)	0.08	0.00	0.14	0.04	0.00	0.17	0.04	0.49	0.49	0.09	
Avail Cap(c_a), veh/h	1011	0	1000	1019	0	998	681	1032	1082	558	
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(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	
Uniform Delay (d), s/veh	19.4	0.0	18.8	19.1	0.0	18.8	3.9	5.5	5.5	4.0	
ncr Delay (d2), s/veh	0.1	0.0	0.5	0.1	0.0	0.6	0.0	1.6	1.6	0.1	
nitial 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 BackOfQ(50%),veh/ln	0.3	0.0	0.2	0.1	0.0	0.3	0.1	4.0	4.1	0.2	
LnGrp Delay(d),s/veh	19.5	0.0	19.2	19.2	0.0	19.5	3.9	.1	/.0	4.1	
LnGrp LOS	В		В	В		В	Þ	Þ	Þ	Þ	1
Approach Vol, veh/h		40			34			1050			
Approach Delay, s/veh		19.4			19.4			7.0			
Approach LOS		В			В			А			
Timer		2	ω	4	5	6	7	ω			
Assigned Phs	_	2		4	5	6		8			
Phs Duration (G+Y+Rc), s	6.0	29.9		8.1	5.4	30.5		<u>8.1</u>			
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5			
Max Green Setting (Gmax), s		25.4		27.0	5.1	24.4		27.0			
Wax O Clear Time (q c+l1), s		9.3		3.2	2.2	7.4		2.8			
Green Ext Time (p_c), s		10.7		0.3	0.0	= :		0.3			
Intersection Summary											4
HCM 2010 Ctrl Delay											
1011110			6 9								

Tumwater Transportation Master Plan SCJ Alliance

HCM 2010 TWSC 39: Elm St & X St

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		Free	Free	Free	Free	Free	Free
RT Channelized		ï	None		í	None		í	None	ī		None
Storage Length												
Veh in Median Storage, #		0			0			0	,	1	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
Mvmt Flow	7	14	14	7	7	ω	ω	88	7	0	61	7
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	·			,	1	,	
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 Stg 1	6.1	5.5		6.1	5.5						,	

					•		,				,	TIOM OF IL OVEIL OF THE
			•		A		A A	_		Þ	A	HCM Lane LOS
					0		5 9.7	9.5		0	7.3	HCM Control Delay (s)
			٠				4 0.021	0.04			0.002	HCM Lane V/C Ratio
						9 1499	6 779	836			1546	Capacity (veh/h)
			SBR		L SBT	1 SBL	NBR EBLn1WBLn1	EBLn:	NBR	NBT	NBL	Minor Lane/Major Mvmt
						ľ	⊳				A	HCM LOS
0		2	0.2			7	9.7				9.5	HCM Control Delay, s
SB		ω	NB			ω	WB				EB	Approach
				ľ	2	9 842	909		l.	814	898	Stage 2
				1	7		912			846	950	Stage 1
				'	0		769			731	795	Mov Cap-2 Maneuver
1499		6 -	1546	2	0 972	9 730	769		1006	731	795	Mov Cap-1 Maneuver
												Platoon blocked, %
						6 842	936			816	910	Stage 2
					9	4 819	914			846	952	Stage 1
1499		6 -	1546	2		2 731	792		1006	732	804	Pot Cap-1 Maneuver
2.218		2 -	2.2	ω	4 3.3		3.5		ယ	4	3.5	Follow-up Hdwy
			,		5	1 5.5	6.1			5.5	6.1	Critical Hdwy Stg 2
					5	1 5.5	6.1			5.5	6.1	Critical Hdwy Stg 1
4.12			4.1	2	.5 6.2	1 6.5	7.1		6.2	6.5	7.1	Critical Hdwy
					ō	8 68	78			100	101	Stage 2
				•			97			64	64	Stage 1
95	0	0 8	68	_	5 91	_,	175		64	164	165	Conflicting Flow All
Majorz			Major				Minor				MInor2	Major/Minor

Tumwater Transportation Master Plan
Synchro 9 Report
SCJ Alliance
6/10/2016

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

Existing 2015
PM Peak Hour

Existing 2015
PM Peak Hour

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ane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
ane Configurations		2 ,	74		2 →	74	J,	4 ↑		JI.	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
Storage Lanes	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	
_ink 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+pt	NA		pm+pt	NA	
Protected Phases		4			00		5	2		_	6	
Permitted Phases	4		4	00		00	2			6		
Detector Phase	4	4	4	00	00	00	5	2		_	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	
Vlinimum Split (s)		33.5	33.5	33.5	33.5	33.5	9.5	27.5		11.5	27.5	
Total Split (s)		34.0	34.0	34.0	34.0	34.0	9.5	29.4		11.6	31.5	
Total Split (%)		45.3%	45.3%	45.3%	45.3%	45.3%	12.7%	39.2%		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	
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	
Total Lost Time (s)		4.5	4.5		4.5	4.5	4.5	4.5		4.5	4.5	
_ead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None	None	None	Max		None	Max	
Intersection Summary												
Area Type:	Other											
Cycle Length: 75												
Actuated Cycle Length: 58.5	5											
Natural Cycle: 75	:											
Control Type: Actuated-Uncoordinated	coordinated											

9.5 31.5s

Splits and Phases:

40: Capitol Blvd & Dennis St

34s \$\frac{1}{2} \text{D04}

Tumwater Transportation Master Plan SCJ Alliance

HCM Signalized Intersection Capacity Analysis 40: Capitol Blvd & Dennis St

Existing 2015
PM Peak Hour

Movement EBI EBI EBI WB WB WB WB WB WB WB													c Critical Lane Group
FBI FBR WBI WBT WBR NBI NBR SBI SBT MB MBT MBR SBI MBT MB SBI SBT MBT MB SBI SBT MBT MB SBI SBT MBT MB SBI SBT MBT MBR SBI SBT MBT MBR SBI SBT MBT MBR SBI SBT MBT MBR MBT										5			Analysis Period (min)
EBI. EBI EBR WBL WBT WBR NBL NBT NBR SBL SBT 145 40 30 30 20 75 10 690 25 50 575 145 40 30 30 20 75 10 690 25 50 575 100 1900 1900 1900 1900 1900 1900 1900				A			of Service	U Level of	೧	53.8%		ation	Intersection Capacity Utiliza
EBI. EBI EBR WBL WBT WBR NBL NBT NBR SBL SBT 145 40 30 30 20 75 10 690 25 50 575 1045 40 30 30 20 75 10 690 25 50 575 10 145 40 30 30 20 75 10 690 25 50 575 10 145 40 30 30 20 75 10 690 1900 1900 1900 1900 1900 1900 19				13.5			time (s)	ım of lost	Sı	62.1			Actuated Cycle Length (s)
EBI. EBI EBR WBL WBT WBR NBL NBT NBR SBL SBT 145 40 30 30 20 75 10 690 25 50 575 10 145 40 30 30 20 75 10 690 25 50 575 10 145 40 30 30 20 75 10 690 25 50 575 10 145 40 30 30 20 75 10 690 1900 1900 1900 1900 1900 1900 19										0.48		city ratio	HCM 2000 Volume to Capa
FBI FBR WBI WBF WBF NBI NBI NBR SBI SBI				В		Service	Level of :	2000 MC	H	12.3			HCM 2000 Control Delay
EBL EBI EBR WBL WBT WBR NBL NBI NBR SBL SBI S 145 40 30 30 20 75 10 690 25 50 575 145 40 30 30 20 75 10 690 25 50 575 140 140 100 1900 1900 1900 1900 1900 190													Intersection Summary
EBL EBI EBR WBL WBT WBR NBL NBI NBR SBL SBI S 145 40 30 30 20 75 10 690 25 50 575 145 40 30 30 20 75 10 690 25 50 575 140 140 100 1900 1900 1900 1900 1900 190		⊳			В			В			C		Approach LOS
EBL EBI EBR WBL WBT WBR NBL NBT NBR SBL SBT 145 40 30 30 20 75 10 690 25 50 575 145 40 30 30 20 75 10 690 25 50 575 145 40 30 30 20 75 10 690 25 50 575 145 40 30 30 20 75 10 690 25 50 575 145 40 30 30 20 75 10 690 25 50 575 146 40 30 30 20 75 10 690 25 50 575 145 40 30 30 20 75 10 690 25 50 575 145 40 30 30 20 75 10 690 25 50 575 145 40 30 30 20 75 10 100 1900 1900 1900 1900 140 100 100 100 100 100 100 100 100 1384 1599 1459 1615 719 3556 700 70 70 159 44 33 33 22 82 71 758 70 70 159 44 33 33 22 82 71 758 70 159 44 33 33 22 82 71 758 70 159 44 33 33 22 82 71 758 70 159 44 48 8 5 2 70 159 1459 1459 1459 1459 1459 1459 1459 159 44 33 33 22 82 71 758 700 150 4 4 8 8 5 2 700 160 203 7 0 55 18 11 782 0 55 700 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 1		8.3			10.8			19.4			26.3		Approach Delay (s)
Here in the interval of the in		Þ	Þ		В	A	В	В		В	C		Level of Service
FBI FBR WBI WBR NBI NBR SBI SBI SBI MBR WBI WBR NBI NBR SBI SBI MBR WBI WBR NBI NBR SBI SBI MBR WBI WBR NBI NBR SBI SBI MBR MBI NBR SBI MBR MBI MBR		8.5	5.5		10.9	7.5	19.1	19.9		19.0	27.5		Delay (s)
FBI FBR WBI WBR NBI NBR SBI SBI MBI NBR MBI NBR MBI NBR MBI NBR		0.5	0.2		0.8	0.0	0.1	0.3		0.0	5.4		Incremental Delay, d2
FBL FBR WBL WBT WBR NBL NBT NBR SBL SBT WBF WBF WBF NBL SBT MBF SBL SBT MBF WBF WBF MBF MBF SBT MBF SBT MBF MBF MBF MBF SBT MBF MBF MBF MBF MBF MBF SBT MBF		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00		Progression Factor
FBL FBR WBL WBT WBR NBL NBT NBR SBL SBT WBR WBT WBR NBL NBT NBR SBL SBT MBR WBT MBR SBT MBR SBT MBR SBT MBR MBL NBT NBR SBT MBR MBR SBT MBR		7.9	5.4		10.0	7.4	19.1	19.6		18.9	22.1		Uniform Delay, d1
EBL EBI EBR WBL WBI WBR NBL NBI NBR SBI ATA ATA <td></td> <td>0.36</td> <td>0.14</td> <td></td> <td>0.44</td> <td>0.03</td> <td>0.05</td> <td>0.17</td> <td></td> <td>0.02</td> <td>0.67</td> <td></td> <td>v/c Ratio</td>		0.36	0.14		0.44	0.03	0.05	0.17		0.02	0.67		v/c Ratio
FBI FBR WBI WBR NBI NBR SBI SBI MBI MBR SBI MBI			0.08			0.01	0.01	0.04		0.00	c0.15		v/s Ratio Perm
FBL FBR WBL WBT WBR NBL NBT NBR SBL SBT WBR WBT WBR NBL NBT NBR SBL SBT MBR WBT WBR NBL NBT NBR SBL SBT MBR WBT WBR NBL NBT NBR SBL SBT MBR WBT WBR NBL NBT NBR SBL SBT WBR WBT WBR NBL NBT NBR SBL SBT WBR WBT WBR MBL NBT NBR SBL SBT WBT MBR SBL SBT WBT MBR SBL SBT WBT MBR MBL NBT MBR SBL SBT MBR MBT MBR MBT MBR SBL SBT MBR MBT MBR MBT MBR MBT MBR MBT MBR MBT		c0.20	c0.01		c0.22	0.00							v/s Ratio Prot
FBL FBR WBL WBT WBR NBL NBT NBR SBL SBT WBR WBT WBR NBL NBT NBR SBL SBT MBR WBT MBR MBT NBR SBL SBT MBR WBT MBR MBT NBR SBL SBT MBR MBT MBR SBL SBT MBR MBT MBR SBL SBT MBR MBT MBR MBT MBR SBL SBT MBR MBT MBR MBT		1925	395		1769	383	356	321		352	305		Lane Grp Cap (vph)
FBL FBR WBL WBT WBR NBL NBT NBR SBL SBT MBC WBT WBR NBL NBT NBR SBL SBT MBC MBT NBR SBL SBT MBC MBT NBR SBL SBT MBC MBT NBR SBT MBC MBT MBC SBT MBC MBT MBC SBT MBC		3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0		Vehicle Extension (s)
FBI FBR WBI WBR NBI NBR SBI SBI MBI WBR NBI NBR SBI SBI MBI MBR SBI SBI MBI MBI NBR SBI SBI MBI		4.5	4.5		4.5	4.5	4.5	4.5		4.5	4.5		Clearance Time (s)
FBL FBR WBL WBT WBR NBL NBT NBR SBL SBT WBR WBL WBT WBR NBL SBT MBR WBL WBT WBR WBT WBR SBT MBR		0.55	0.61		0.50	0.51	0.22	0.22		0.22	0.22		Actuated g/C Ratio
## Comparisons Fabra Fabr		34.0	38.0		30.9	31.8	13.7	13.7		13.7	13.7		Effective Green, g (s)
FBI FBR WBI WBR NBI NBR SBI SBI MBI NBR		34.0	38.0		30.9	31.8	13.7	13.7		13.7	13.7		Actuated Green, G (s)
## Company of the com			6			2	8		8	4		4	Permitted Phases
FBL EBT EBR WBL WBT WBR NBL NBT NBR SBL SBT MBC WBT WBR NBL SBT MBC MBT NBR SBL SBT MBC MBT NBR SBL SBT MBC MBT MBC MBT MBC MBT MBC SBT MBC		6			2	5		00			4		Protected Phases
Company Comp		NA	pm+pt		NA	pm+pt	Perm	NA	Perm	Perm	NA	Perm	Turn Type
Ons EBL EBI EBR WBL WBI WBR NBL NBI NBR SBL SBI (Ph) 145 40 30 30 20 75 10 650 25 50 575 (Ph) 145 40 30 30 20 75 10 650 25 50 575 (Ph) 145 40 30 30 20 75 10 650 25 50 575 (Ph) 145 40 30 30 20 75 10 650 25 50 575 (Ph) 145 40 30 30 20 75 10 650 25 50 575 (Ph) 145 40 30 30 20 75 10 650 25 50 575 (Ph) 145 40 100 1900 1900 1900 1900 1900 1900 19	_	1%	1%	1%	1%	1%	0%	0%	0%	1%	1%	1%	Heavy Vehicles (%)
TEBL EBI EBR WBL WBI WBR NBL NBI NBR SBL SBI MBR NBL NBI NBR SBL SBI NB		700	55 6	0	782	⊒ ,	18	55	0	7	203	0	Lane Group Flow (vph)
THE LEBI EBR WBL WBI WBR NBL NBI NBR SBL SBI NBR NBL NBI NBR NBL SBI SBI NBR NBL NBI NBR SBL SBI NBR NBL NBI NBR NBL NBI NBR NBL SBI NBR NBL NBI		9	0 5	0 4	ω c	o =	64	0	0 0	2 2	o ‡	0	RTOR Reduction (vnh)
TEBL EBI EBR WBL WBI WBR NBL NBI NBR SBL SBI (Ph) 145 40 30 30 20 75 10 650 25 50 575 (Ph) 145 4.5 4.5 4.5 4.5 4.5 4.5 4.5 4.5 4.5 4	0.0	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, PHF
TEBL EBI EBR WBL WBI WBR NBL NBI NBR SBL SBI (A) A A A A A A A A A A A A A A A A A A		3516	512		3556	719	1615	1459		1599	1384		Satd. Flow (perm)
TEBL EBT EBR WBL WBT WBR NBL NBT NBR SBL SBT MBH NBT		1.00	0.27		1.00	0.38	1.00	0.77		1.00	0.74		Flt Permitted
BEL EBT EBR WBL WBT WBR NBL NBT NBR SBL SBT (A) 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		3516	1787		3556	1787	1615	1845		1599	1810		Satd. Flow (prot)
TEBL EBI EBR WBL WBI WBR NBL NBI NBR SBL SBI ONS 145 40 30 30 20 75 10 690 25 50 575 pph) 145 40 30 30 20 75 10 690 25 50 575 pph) 1900 1900 1900 1900 1900 1900 1900 190		1.00	0.95		1.00	0.95	1.00	0.97		1.00	0.96		Flt Protected
THE LEBI EBR WBL WBI WBR NBL NBI NBR SBL SBI NBR NBL NBI NBR NBL SBI NBR NBL SBI NBR NBL SBI NBR NBL NBI NBR NBL SBI NBR NBR NBL SBI NBR NBR NBL SBI NBR NBR NBL SBI NBR NBL SBI NBR		0.98	1.00		0.99	1.00	0.85	1.00		0.85	1.00		Frt
EBL EBI EBR WBL WBI WBR NBL NBI NBR SBL SBI ns 44 7 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		0.95	1.00		0.95	1.00	1.00	1.00		1.00	1.00		Lane Util. Factor
EBL EBI EBR WBL WBI WBR NBL NBI NBR SBL SBI 18 4 7 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		4.5	4.5		4.5	4.5	4.5	4.5		4.5	4.5		Total Lost time (s)
EBL EBT EBR WBL WBT WBR NBL NBT NBR SBL SBT 145 40 30 30 20 75 10 690 25 50 575 145 40 30 30 20 75 10 690 25 50 575	190	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	Ideal Flow (vphpl)
EBL EBT EBR WBL WBT WBR NBL NBT NBR SBI SBT 145 40 30 30 20 75 10 690 25 50 575		575	50	25	690	10	75	20	30	30	40	145	Future Volume (vph)
EBL EBT EBR WBL WBT WBR NBL NBT NBR SBL SBT		575	50	25	690	10	75	20	30	30	40	145	Traffic Volume (vph)
EBL EBT EBR WBL WBT WBR NBL NBT NBR SBL SBT		÷	_#		→	H	74	ž,		-1	2,		Lane Configurations
	SB	SBT	SBL	NBR	NBT	NBL	WBR	WBT	WBL	EBR	EBT	EBL	Movement
	4	+	*	7	_	J	1	1	•	4	ţ	\	

Turnwater Transportation Master Plan
Synchro 9 Report
SCJ Alliance
2/9/2016

Lanes, Volumes, Timings
41: Israel Rd & Capitol Blvd

Existing 2015
PM Peak Hour

	-	ļ	1	1	Ť	1	۶	→	*	•	—	•
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	JI.	¥		ĸ	₹		ĸ	∌		_#	}	
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	150		0	150		0	100		0
Storage Lanes	_		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)		2751			725			934			1337	
Travel Time (s)		62.5			16.5			21.2			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%
Turn Type	DM-Int	N		DB F D	N		nm±nt	NA		nm±nt	N	
Protected Phases	ω	œ		7	4			6		5	2	
Permitted Phases	œ			4			6			2		
Detector Phase	ω	8		7	4		_	6		5	2	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Minimum Split (s)		26.5		10.5	26.5		10.5	26.5			26.5	
Total Split (s)		26.5		10.5	26.5		10.6	27.5			27.4	
Total Split (%)		35.3%		14.0%	35.3%		14.1%	36.7%			36.5%	
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		Lag		Lead	Lag		Lead	Lag			Lag	
Lead-Lag Optimize?		Yes		Yes	Yes		Yes	Yes			Yes	
Recall Mode	None	None		None	None		None	Max		None	Max	
Intersection Summary												
	Other											
Cycle Length: 75												
Actuated Cycle Length: 66.3												
Natural Cycle: /5	ordinatod											
Control Type: Actuated-Uncoordinated	ordinated											

10.5s 27.5s

√ Ø7

Ø3 10.5 s

26.5_s

Splits and Phases:

41: Israel Rd & Capitol Blvd

Tumwater Transportation Master Plan SCJ Alliance

HCM 2010 Signalized Intersection Summary 41: Israel Rd & Capitol Blvd

Existing 2015
PM Peak Hour

Movement	↓ -⁄	^	1	<i>></i>	٠	→	•	•	-	•
80 80 80 80 1.00 1.00 1.00 1.00 1.00 1.00 1.00 89 89 89 10 10 10 10 10 10 10 10 10 10	BT EBR	WBL .	WBT	WBR	NBL .	NBT .	NBR ·	SBL	SBI .	SBR
80 80 80 80 80 100 100 1100 1100 1900 89 1 1007 1810 89 1007 1810 89 1007 1810 89 1007 1810 89 1007 1810 89 1007 1810 180 2.4 2.4 2.4 1.00 1	۱	Jį.	₽÷		Ħ	÷		Ħ	→	
) 80 3 0 1,00 1,00 1,00 1,00 1,00 89 1 0,07 1810 89 Win 1810 2,4 2,4 1,00 2,4 1,00 3324 1,00 2,4 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,	130 120	95	195	135	105	315	25	70	515	90
3 0 1.00 1.00 1900 89 1 0.90 6 0 295 0.07 1810 89 Win 1810 2.4 1.00 2.4 1.00 2.4 1.00 2.4 1.00 2.8 1.00 1.0		95	195	135	105	315	25	70	515	90
0 1.00 1.00 1900 89 1 1 0.90 6 0 295 0.07 1810 2.4 2.4 2.4 2.4 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.	8 18	7	4	14	_	6	16	5	2	12
1.00 1.00 1.00 1.00 1.00 1.00 89 89 1 0.07 1.810 89 1/1 1.810 2.4 2.4 2.4 1.00 1.00 1.00 eh 17.9 eh 0.7 eh 0.7 eh 18.6 B B Tanax), S 4.5 0.9 9.5 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.		0	0	0	0	0	0	0	0	0
1.00 1900 89 1 0.90 6 0 295 0.07 1810 89 Win 1810 24 1.00 24 1.00 3324 1.00 3324 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0	1.00	1.00		1.00	1.00		1.00	1.00		1.00
1900 89 89 1 0.90 6 0 295 0.07 1810 89 Win 1810 2.4 1.00 2.4 1.00 1.		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
89 1 0.90 6 0 295 0.07 1810 89 Win 1830 2,4 2,4 1,00 0,30 324 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,0		1863	1863	1900	1881	1881	1900	1881	1881	1900
1 0.90 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		106	217	150	117	350	28	78	572	100
0.90 0.007 1810 89 1810 2.4 2.4 1.00 2.95 3.24 1.00 2.95 0.30 3.24 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0	1 0	_	_	0	_	2	0	_	2	0
0 295 0.07 1810 89 1810 2.4 1.00 2.95 0.30 3.34 1.00 1.00 1.00 1.00 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.8 18.6 18.6 18.6 19.6 19.6 19.6 19.6 19.6 19.6 19.6 19	0	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
295 0.007 1810 89 89 1810 2.4 2.4 2.4 1.00 295 0.30 3.24 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0		2	2	2	_	_	_	_	_	_
1810 1810 1810 24 24 24 1.00		420	266	184	379	1147	91	493	1009	176
1810 89 1810 2.4 2.4 1.00 2.95 0.30 3.24 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0	0.25	0.08	0.26	0.26	0.08	0.34	0.34	0.07	0.33	0.33
89 1810 2.4 2.4 2.4 1.00 2.95 0.30 1.00 1.00 1.00 1.00 1.00 1.00 1.00	234 566	1774	1027	710	1792	3354	267	1792	3044	531
1810 2.4 2.4 2.4 2.95 0.30 3.24 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0	0 210	106	0	367	117	186	192	78	335	337
2.4 2.4 1.00 2.95 0.30 3.24 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0	_	1774	0	1737	1792	1787	1834	1792	1787	1788
2.4 1.00 295 0.30 3.24 1.00 1.00 1.00 1.00 0.7 0.7 0.7 0.7 1.1 1.2 1.8 6 8 8 8 8 8 9.5 9.5 9.5 9.5 9.5 9.5 9.5 9.5 9.5 9.5		2.9	0.0	13.7	2.9	5.3	5.3	1.9	10.7	10.7
1.00 295 0.30 3.24 1.00 1.00 1.00 1.00 0.7 0.7 0.7 0.7 1.1 1.8 6 1.8 8 8 8 8 8 8 9.9 9.9 9.9 9.9 9.9 9.9 9		2.9	0.0	13.7	2.9	5.3	5.3	1.9	10.7	10.7
295 0.30 3.24 1.00 17.9 0.7 0.7 0.0 18.6 18.6 18.6 18.6 8 8		1.00		0.41	1.00		0.15	1.00		0.30
0.30 3.24 1.00 1.00 1.00 0.7 0.0 0.7 0.0 1.2 1.8 6 1.8 1.8 1.8 1.8 1.8 1.8 1.8 1.8 1.8 1.8	0 458	420	0	450	379	611	627	493	593	593
324 1.00 1.00 1.00 0.7 0.7 0.0 18.6 18.6 19.5 11.2 18.6 14.5 8 4.5 8		0.25	0.00	0.82	0.31	0.30	0.31	0.16	0.57	0.57
1.00 17.9 0.7 0.7 0.0 11.2 11.6 11.6 1.0 0.0 0.0 1.0 1.0 0.7 0.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0		441	0	554	398	611	627	528	593	593
1.00 17.9 0.7 0.0 0.0 0.0 18.6 18.6 18.6 19.0 19.0 19.0 19.0 19.0 19.0 19.0 19.0		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
0.7 0.7 0.7 0.0 0.0 0.0 0.0 0.0 18.6 18.6 18.6 18.6 18.6 19.6 19.6 19.6 19.6 19.6 19.6 19.6 19	1.00	1.00	0.00	3.00	130	1.00	1.00	13.0	100	1.00
0.0 0.0 0.0 0.0 0.0 1.2 1.8.6		0.4	000	8 1	0.5	<u>۔</u> د	<u>۔</u> د د	0.2	بر م د	٠.٠
III 12 III II	0.0 0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18.6 B B 1 1 1 1 1, s 9,9 9,9 8 4.5 8 4.5 1,0 1,0 1,0 1,0 1,0 1,0 1,0 1,0 1,0 1,0		1.5	0.0	7.5	1.5	2.8	2.9	1.0	5.9	5.9
B 1 1 1 1 1 1 1 1 1 1 1 1 1	0.0 22.6	17.2	0.0	32.1	14.4	18.0	18.0	13.4	22.9	22.9
1 1 1 1, s 9,9 8 4.5 8 4.5 8 4.5 8 4.5 11), s 6.1 11), s 6.1	С	В		С	В	В	В	В	С	C
1 1 1 1 1 1 8 9, 5 9,9 8 4.5 8 8,11), 5 6.1 1,11), 5 4.9	299		473			495			750	
1 1 1 1 1 1 8, s 9,9 8 4.5 8 4.5 8 4.5 8 4.7 8 6.1 1 (1), s 4.9	21.4		28.8			17.1			21.9	
1 1 1 1 1 3 8 9.9 8 4.5 8 4.5 1 1), s 6.1 1 1), s 6.1 0.0	С		С			В			С	
1 9.9 s 4.5 ax), s 6.1 h11), s 4.9	2 3	4	5	6	7	8				
s 4.5 ax), s 6.1 +11), s 4.9		4	5	6	7	œ				
s 4.5 ax), s 6.1 H1), s 4.9		22.4	9.2	28.1	9.7	22.1				
ax), s 6.1 H1), s 4.9 0.0		4.5	4.5	4.5	4.5	4.5				
H1), s 4.9 0.0		22.0	6.0	23.0	6.0	22.0				
0.0	12.7 4.4	15.7	3.9		4.9	8.8				
		2.2	0.0	6.8	0.0	3.5				
ntersection Summary										
HCM 2010 Ctrl Delay										
1CM 2010 LOS	22.3									

Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

> HCM 2010 TWSC 42: 66th Ave & Black Lake Belmore Rd

Existing 2015
PM Peak Hour

int Delay, s/veh 3.9	•					
Novement	EBL	EBT	WBT	T WBR	SBL	SBR
raffic Vol, veh/h	50	80	90		70	55
Future Vol, veh/h	50	80	90	0 105	70	55
Conflicting Peds, #/hr	0	0	0		0	0
Sign Control	Free	Free	Free	_	Stop	Stop
RT Channelized		None				None
Storage Length					0	
Veh in Median Storage, #		0		0	0	
Grade, %		0			0	
Peak Hour Factor	95	95	95	.0	95	95
Heavy Vehicles, %	_	_			0	0
Wmt Flow	53	84	95	_	74	58
/ajor/Minor	Major1		Major2	2	Minor2	
Conflicting Flow All	205	0		- 0	339	150
Stage 1					150	
Stage 2					189	
Critical Hdwy	4.11				6.4	6.2
Critical Hdwy Stg 1					5.4	
ritical Hdwy Stg 2					5.4	
-ollow-up Hdwy	2.209				3.5	3 3 3 3
ot Cap-1 Maneuver	13/2				661	902
Stage 1					0 883	
Platoon blocked %					040	
Mov Cap-1 Maneuver	1372				634	902
Vlov Cap-2 Maneuver					634	
Stage 1					883	
Stage 2					813	
Approach	EB		WB	В	SB	
HCM Control Delay, s	ω			0	1	
HCM LOS					В	
Minor Lane/Major Mvmt	EBL	EBT WB1	WBR SBLn1			
Capacity (veh/h)	1372					
HCM Lane V/C Ratio	0.038		- 0			
HCM Control Delay (s)	7.7	0				
HCM Lane LOS	2 A	A				

Tumwater Transportation Master Plan SCJ Alliance

HCM 2010 TWSC 43: Kirsop Rd & 66th Ave

Existing 2015
PM Peak Hour

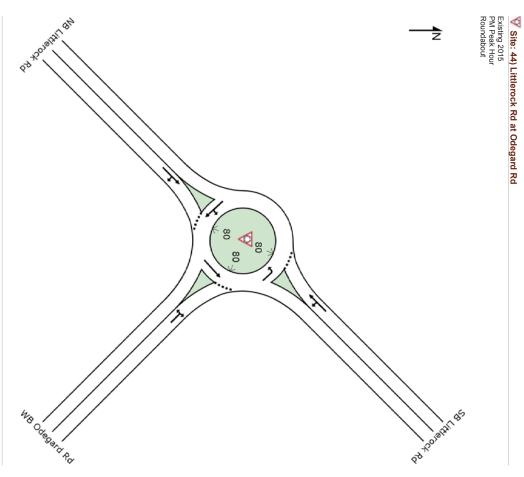
Intersection												
Int Delay, s/veh 7.7	7											
Movement	EBL	EBT	EBR	WBL \	NBT	WBR	NBL	NBT	NBR	SBL	SBT	SBF
Traffic Vol, veh/h	15	5	130	2	0	2	205	15	2	5	5	ω
Future Vol, veh/h	15	5	130	2	0	2	205	15	2	5	5	ω
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized		- None	None			- None		,	None			None
Storage Length		,							,			
Veh in Median Storage, #		0			0			0			0	
Grade, %		0			0			0	,		0	
Peak Hour Factor	84	84	84	84	84	84	84	84	84	84	84	84
Heavy Vehicles, %	_	_	_	0	0	0	_	_	_	0	0	
Vivmt Flow	≅	6	155	2	0	2	244	ळ	2	6	6	ယ

							⊳	Þ	В	В		⊳	Α	HCM Lane LOS
							0	7.2	12.8	- 10.3		0	7.7	HCM Control Delay (s)
								0.004	0.01 0.004	- 0.208	ĺ		0.155	HCM Lane V/C Ratio
								464 1609	464	- 860			1573	Capacity (veh/h)
						SBR	SBT	SBL	VBLn1	NBR EBLn1WBLn1		NBT	NBL	Minor Lane/Major Mvmt
									В				В	HCM LOS
		0.9			7.1				12.8				10.3	HCM Control Delay, s
		SB			NB				WB				EB	Approach
								851	755	ľ		455	462	Stage 2
,	,	,	,				,	458	465	,		864	828	Stage 1
								369	297		_	376	395	Mov Cap-2 Maneuver
		1609			1573		1065	369	297	01	1055	376	395	Mov Cap-1 Maneuver
														Platoon blocked, %
			,		·		,	854	894	•		540	549	Stage 2
								543	552			867	982	Stage 1
,	i	1609	·		1573		1065	439	401	01		448	451	Pot Cap-1 Maneuver
		2.2			2.209		3.3	4	3.5	ę		4.009	3.509	Follow-up Hdwy
								5.5	6.1			5.51	6.11	Critical Hdwy Stg 2
							,	5.5	6.1			5.51	6.11	Critical Hdwy Stg 1
		4.1			4.11		6.2	6.5	7.1	Ī	6.21	6.51	7.11	Critical Hdwy
								54	116			508	508	Stage 2
,	í		í		í		,	507	507			36	36	Stage 1
0	0	20	0	0	42		19	561	623	+-	24	544	544	Conflicting Flow All
		Major2			Major1				Minor1				Minor2	Major/Minor

Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

SITE LAYOUT



Created: Thursday, October 29, 2015 2:26:45 PM
SIDRA INTERSECTION 8,0 24.4877
Project: N:Projects:0625 City of Tumwater/0625.17 Tumwater Transportation Master Plan\Traffic\Operations sidra 8001450, 6017302, SCI ALLIANCE, PLUS / 1PC

SIDRA INTERSECTION 6

MOVEMENT SUMMARY

₩ Site: 44) Littlerock Rd at Odegard Rd

Existing 2015 PM Peak Hour Roundabout

	2						2100				
ōŞ	Mov	Total HV	₹ Z	Sath	Delay	Service	Vehicles Distan	Distance	Queued	Stop Rate	Speed
										per veh	mph
SouthEa	SouthEast: WB Odegard Rd	gard Rd									
3x	L2	16	0.0	0.030	13.6	LOS B	0.2	3.9	0.64	0.70	33.2
18x	R2	σı	0.0	0.030	8.2	LOSA	0.2	3.9	0.64	0.70	32.4
Approach	አ	22	0.0	0.030	12.2	LOSB	0.2	3.9	0.64	0.70	33.0
NorthEa	NorthEast: SB Littlerock Rd	rock Rd									
1×	L2	⇉	,								
6x	7		1.0	0.594	9.6	LOSA	6.8	172.4	0.21	0.39	36.7
Approach		720	1.0	0.594	9.6 4.4	LOSA	6.8	172.4 172.4	0.21	0.39	36. 36.
SouthW	'n	720 731	1.0	0.594 0.594 0.594	9.6 4.4 4.4	LOS A	6.8	172.4 172.4 172.4	0.21	0.39	36.8 36.8
2x	Approach 731 SouthWest: NB Littlerock Rd	720 731 erock Rd	1.0	0.594 0.594 0.594	9.6 4.4 4.4	LOS A	6.8	172.4 172.4 172.4	0.21	0.39	36. 36.
12x	est: NB Little	720 731 erock Rd 667	1.0	0.594 0.594 0.594 0.594	9.6 4.4 4.3	LOS A	5.0	172.4 172.4 172.4 172.4	0.21 0.21 0.21	0.39	36.8 36.8 36.8
	est: NB Little T1 R2	720 731 erock Rd 667 5	1.0	0.594 0.594 0.594 0.541 0.541	9.6 4.4 4.3 4.2	LOS A LOS A LOS A	5.0 6.8 5.0	172.4 172.4 172.4 172.4 127.2	0.21 0.21 0.21 0.14 0.14	0.39 0.39 0.39 0.39	36.8 36.8 36.8 37.1
Approach	est: NB Little T1 R2	720 731 erock Rd 667 5	1.0	0.594 0.594 0.594 0.541 0.541 0.541	9.6 4.4 4.3 4.3 4.3 4.3	LOS A LOS A LOS A	5.0 6.8 6.8 5.0 5.0 6.8	172.4 172.4 172.4 172.4 127.2 127.2 127.2	0.21 0.21 0.21 0.14 0.14 0.14	0.39 0.39 0.39 0.39 0.39	36.8 36.8 36.8 37.1 37.1

Level of Service (LOS) Method: Delay & vc (HCM 2010).

Roundabout LOS Method: Same as Signalised Intersections.

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay and vc ratio (degree of saturation) per movement

LOS F will result if vic > 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 (vic 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 M3D).

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

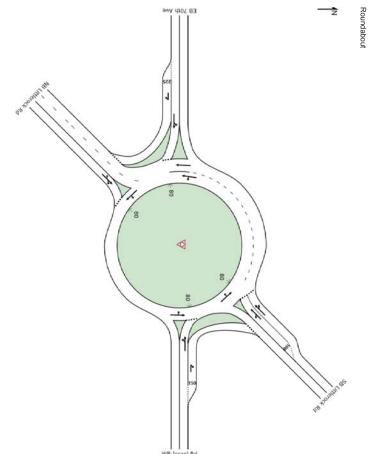
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Project: N:Projects 0.625 City of Turnwaten0625.17 Turnwater Transportation Master Plan\text{TrafficOperations\text{Sidra}}
Existing 2015 FM.sip6
8001450, 6017302, SCJALLIANCE, PLUS / 1PC

SIDRA INTERSECTION 6

SITE LAYOUT

W Site: 45) Littlerock Rd at Israel Rd

Existing 2015 PM Peak Hour Roundabout



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Project: N:Projects\0.025 City of Turnwaler\0.025.17 Turnwaler Transportation Master Plan\0.0000 Traffic\0.0000 Perations\0.0000 Sidra 8001450, 6017902, SCJ ALLIANCE, PLUS / 1PC



MOVEMENT SUMMARY

W Site: 45) Littlerock Rd at Israel Rd

Existing 2015 PM Peak Hour Roundabout

Moveme Mov ID East: WB 1a 6 16b Approach	Movement Performance Mov OD Dor Tot ID Mov East: WB Israel Rd 5 1a L1 5 6 T1 15 16b R3 27 Approach 48 NorthEast: SB Littlerock Rd 13 1bx L3 13	Movement Performance - Vehicles Mov OD Demand Flows Mov OD Demand Flows ID Mov Total HV East: WB Israel Rd 58 1.0 1a L1 158 1.0 6 T1 158 1.0 16b R3 274 1.0 Approach 489 1.0 NorthEast: SB Littlerock Rd NorthEast: SB Littlerock Rd 1bx L3 137 1.0	nicles Flows HV 1.0 1.0 1.0	Deg. Sath V/c 0.259 0.259 0.258 0.258	Average Delay sec 12.0 7.8 6.1 7.4	Los B Los A Los A	95% Back o Vehicles veh 1.8 1.7 1.7	95% Back of Queue Vehicles Distance ft veh 1.8 44.8 1.8 44.8 1.8 44.8 1.8 44.8 60.0	k of Que Dist	k of Queue Distance ft 44.8 44.8 41.6 44.8
NorthEa 1bx 6x 16ax	IST: SB Littler L3 T1 R1	ock Rd 137 426 121	1.0	0.364 0.364 0.364	13.8 7.3 6.6	LOS A	2.5		60.0 62.2	60.0 0.69 62.2 0.68 62.2 0.68
Approach		684	1.0	0.364	8.5	LOSA	2.5		62.2	62.2 0.68
West E	West EB 70th Ave									
5a	7	105	1.0	0.221	10.5	LOS B	1.0	1.0 25.7		25.7
2	7	28	1.0	0.221	6.5	LOSA	1.0	1.0 25.7		25.7
12b	R3	79	1.0	0.085	5.6	LOSA	0.3	0.3 8.8		8.8
Approach	¥	268	1.0	0.221	7.8	LOSA	1.0	1.0 25.7		25.7
SouthW	SouthWest: NB Littlerock Rd	rock Rd								
5bx	L3	253	1.0	0.606	14.9	LOS B	5.6	5.6 140.5		140.5
2 _x	T 1	268	1.0	0.606	8.5	LOSA	5.6	5.6 140.5		140.5
12ax	꼰	32	1.0	0.606	8.1	LOSA	5.6	5.6 140.5	.6	.6 140.5
Approach	ň	553	1.0	0.606	11.4	LOSB	5.6	5.6 140.5		140.5
All Vehicles	cles	1995	1.0	0.606	8.9	LOSA	5.6	5.6 140.5		140.5

Level of Service (LOS) Method: Delay & vic (HOM 2010).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay and vic ratio (degree of saturation) per movement

LOS F will result if vic > 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 (vic not used as specified in HOM 2010).

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay. Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

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

	,	Ļ	4	1	†	<i>></i>	۶	→	•	•	←	•
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	_#	¥		JI.	¥		_#	ð,		JI.	₽ [,]	
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
Storage Lanes	_		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)		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+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	N	
Protected Phases	7	4		ω	00		5	2		_	6	
Permitted Phases	4			00			2			6		
Detector Phase	7	4		ω	00		5	2		_	6	
Switch Phase												
Minimum Initial (s)	4.0	5.0		4.0	5.0		4.0	6.0			6.0	
Minimum Split (s)	8.5	20.5		8.5	20.5		8.5	21.5			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%			36.5%	
Yellow Time (s)	3.5	ω .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	
Lost Time Adjust (s)	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	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag			Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes			Yes	
Recall Mode	None	None		None	None		None	Max			Max	
Intersection Summary												
Area Type:	Other											
0												

Cycle Length: 60
Actualed Cycle Length: 52.4
Natural Cycle: 60
Control Type: Actualed-Uncoordinated

Splits and Phases: 46: Linderson Way & Israel Rd

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SCJ Alliance Tumwater Transportation Master Plan

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

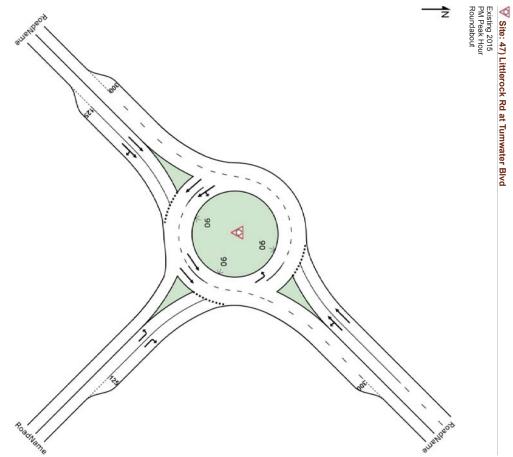
Existing 2015
PM Peak Hour

Movement		1	; .		H	NAP D	·)		
MOVELLIGIT	뜐	EBI	EBE	WBL	₩ <u>₩</u>	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	NBL	NBI	NBR	SBL	SBT	SBR
Lane Configurations	#	¥		æ	₽		J,	Þ,		Ji.	₩	
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	ω	00	18	5	2	12	_	6	16
nitial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
٦	1881	1881	1900	1881	1881	1900	1881	1881	1900	1881	1881	1900
	42	174	32	142	274	26	116	89	42	42	84	53
Adj No. of Lanes	_	_	0	_	_	0	_	_	0	_	_	0
7	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
ъ, %	_	_	_	_	_	_	_	_	_	_	_	_
	286	277	51	378	388	37	597	435	205	590	356	224
7	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	 &
	42	0	206	142	0	300	116	0	131	42	0	137
۷ln	1792	0	1831	1792	0	1853	1792	0	1780	1792	0	1761
	1.0	0.0	5.5	ω .ω	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	ω .ω	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		0.32	1.00		0.39
Lane Grp Cap(c), veh/h	286	0	328	378	0	425	597	0	641	590	0	580
V/C Ratio(X)	0.15	0.00	0.63	0.38	0.00	0.71	0.19	0.00	0.20	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(i)	170	0.00	30.00	15.7	0.00	10.00	10.00	0.00	11 7	100	0.00	130
incr Delay (d2), s/yeh	0.1	0.0	20.0	0.0	0.0	2.4	01	0.0	0.7	0.0	0.0	10
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	2.9	1.6	0.0	4.3	1.1	0.0	1.4	0.4	0.0	1.6
_nGrp 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	В		С	В		С	В		В	В		В
Approach Vol, veh/h		248			442			247			179	
Approach Delay, s/veh		21.2			19.5			11.5			13.2	
Approach LOS		С			В			В			В	
Timer		2	ω	4	5	6	7	00				
Assigned Phs	_	2	ω	4	5	6	7	∞				
Phs Duration (G+Y+Rc), s	6.3	23.5	9.0	14.0	7.9	21.9	6.3	16.6				
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 (g_c+l1), 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			σ.									

Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

SITE LAYOUT



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SIDRA INTERSECTION 6

MOVEMENT SUMMARY

W Site: 47) Littlerock Rd at Tumwater Blvd

Existing 2015 PM Peak Hour Roundabout

Mov	OD	Demand Flows	Flows	Deg.		Level of	95% Back of Queue	f Queue	Prop.	Effective	
ō	Mov	Total veh/h	% ₹	Satn v/c	Delay sec	Service	Vehides veh	Distance ft	Queued	Stop Rate per veh	Speed mph
SouthEa	SouthEast: RoadName										
3x	L2	239	1.0	0.212	10.4	LOSB	<u>-</u>	26.8	0.32	0.64	34.2
18x	23	298	1.0	0.251	4.9	LOSA	1.3	33.2	0.33	0.51	35.8
Approach	ד	537	1.0	0.251	7.3	LOSA	1.3	33.2	0.32	0.57	35.0
VorthEa	NorthEast: RoadName	Ф									
×	L2	324	1.0	0.365	11.0	LOSB	2.1	52.2	0.45	0.67	34.4
6x	⇉	303	1.0	0.365	5.6	LOSA	2.1	52.2	0.43	0.56	35.8
Approach	Ъ	628	1.0	0.365	8.4	LOSA	2.1	52.2	0.44	0.62	35.1
SouthW	SouthWest RoadName	ne									
2x	⊐	4	0.0	0.137	5.6	LOSA	0.7	16.7	0.44	0.52	36.3
12x	R2	112	0.0	0.115	5.6	LOSA	0.5	13.5	0.44	0.58	35.5
Approach	г	255	0.0	0.137	5.6	LOSA	0.7	16.7	0.44	0.55	35.9
							21	A 2 2	0 40	0.59	

Level of Service (LOS) Method: Delay & vic (HCM 2010).

Roundabout LOS Method: Same as Signalised intersections.

Vehicle movement LOS values are based on average delay and vic ratio (degree of saturation) per movement LOS values are based on average delay and vic ratio (degree of saturation) per movement LOS intersection.

LOS I will result if vic > 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 (vic 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 M3D).

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

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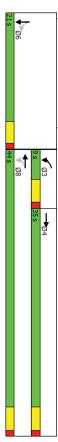
SIDRA INTERSECTION 6

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

Existing 2015

	Actuated Cycle Length: 64.6	vicia Lanath: 65	a Type.	tersection Summary	Recall Mode	ad-Lag Optimize?	_ead/Lag	otal Lost Time (s)	ost Time Adjust (s)	III-Red Time (s)	llow Time (s)	tal Split (%)	Total Split (s)	nimum Split (s)	nimum Initial (s)	witch Phase	etector Phase	ermitted Phases	rotected Phases	Turn Type	hared Lane Traffic (%)	leavy Vehicles (%)	eak Hour Factor	ravel Time (s)	ink Distance (ft)	k Speed (mph)	ight Turn on Red	aper Length (ft)	Storage Lanes	Storage Length (ft)	deal Flow (vphpl)	uture Volume (vph)	raffic Volume (vph)	ane Configurations	ane Group	
Natural Cycle: 65 Control Type: Actuated-Uncoordinated	yth: 64.6	CIIId		7																	_	1%	0.94					25	0	0	1900	0	0		EBL	,
d.					None	Yes	Lag	4.5	0.0	1.0	3.5	53.8%	35.0	20.5	4.0		4		4	NA		1%	0.94	41.9	1843	30					1900	340	340	ᢌ	EBT	ļ
																						1%	0.94				Yes		0	0	1900	70	70		EBR	4
					None	Yes	Lead			1.0	3.5		9.0	8.5	4.0		ω	8	ω	pm+pt		1%	0.94					25	0	0	1900	320	320		WBL	4
					Max			4.5	0.0	1.0	3.5	67.7%	44.0	20.5	4.0		00		00	NA		1%	0.94	18.3	807	30					1900	275	275	2 >	WBT	†
																						1%	0.94				Yes		0	0	1900	0	0		WBR	<i>></i>
																						0%	0.94					25	0	0	1900	0	0		NBL	۶
																						0%	0.94	33.1	1457	30					1900	0	0		NBT	→
																											Yes		0	0	1900	0	0		NBR	•
					None								21.0	20.5	4.0		6	6		Perm	14%	4%	0.94					25	_	350	1900	405	405	_#	SBL	•
					None			4.5	0.0	1.0	3.5	32.3%	21.0	20.5	4.0		6		6	NA		4%	0.94	35.7	1571	30					1900	30	30	₽	SBT	←
																						4%	0.94				Yes		0	0	1900	235	235		SBR	•

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



SCJ Alliance Tumwater Transportation Master Plan

HCM 2010 Signalized Intersection Summary 48: I-5 SB Ramps & Tumwater Blvd

Existing 2015
PM Peak Hour

Vovement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		∌			ž,					Ħ	\$ →	
Traffic Volume (veh/h)	0	340	70	320	275	0	0	0	0	405	30	235
Huture Volume (ven/h)	J O	340	1 0	320	2/5	100	С	c	c	405	, 30	235
nitial Q (Qb), veh	0 -	0 4	0 1	0 0	0	0 0				0 -	0	0 5
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				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1881	1900	1900	1881	0				1827	1827	1900
Adj Flow Rate, veh/h	0	362	74	340	293	0				269	259	74
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94				0.94	0.94	0.94
Percent Heavy Veh, %	0	:	:		:	0				4	4	4
Cap, veh/h	0	1864	377	90	26	0				396	311	89
Arrive On Green	0.00	0.63	0.63	0.63	0.63	0.00				0.23	0.23	0.23
Sat Flow, veh/h	0	3057	599	2	42	0				1740	1367	391
Grp Volume(v), veh/h	0	217	219	633	0	0				269	0	333
Grp Sat Flow(s), veh/h/ln	0	1787	1775	44	0	0				1740	0	1758
2 Serve(g_s), s	0.0	υ υ ν	ပ ပ	17.2	0.0	0.0				0.9	0.0	113
Prop In Lane	0.00	J.L	0.34	0.54	0.0	0.00				1.00	0.0	0.22
Lane Grp Cap(c), veh/h	0	1124	1117	0	0	0				396	0	400
V/C Ratio(X)	0.00	0.19	0.20	0.00	0.00	0.00				0.68	0.00	0.83
Avail Cap(c_a), veh/h	3 0	1124	1117	200	300	30				457	30	462
Upstream Filter(I)	0.00	1.00	1.00	1.00	0.00	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				22.2	0.0	23.1
ncr Delay (d2), s/veh	0.0	0.1	0.1	0.0	0.0	0.0				ယ	0.0	11.0
initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%IIe BackOtQ(50%),veh/In	0.0	1.6	1.6	0.0	0.0	0.0				4.6	0.0	6./
InGrp Delay(d),s/ven	0.0	D.0	5.0 A	0.0	0.0	0.0				25.5	0.0	34.1
Approach Vol. veh/h		436			633						602	
Approach Delay, s/veh		5.0			0.0						30.3	
Approach LOS		A			A						С	
Timer		2	w	4	57	6	7	&				
Assigned Phs				4		6		8				
Phs Duration (G+Y+Rc), s				44.0		18.8		44.0				
Change Period (Y+Rc), s				4.5		4.5		4.5				
Wax Green Setting (Gmax), s				30.5		16.5		39.5				
Max Q Clear Time (g_c+l1), 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									
			כ									

Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

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

Existing 2015
PM Peak Hour

RBT EBR WB WBT WBR NBL NBL NBT NBR SBL 610 0 0 550 1210 45 5 135 0 0 0 0 0 0 0 0 0	Int Delay, s/veh 5	Ġ											
135 610 0 0 0 550 1210 45 5 135 0	Movement	E	FRT	FRR	П		WRT	WRR	NBI	NRT I	NRR	SBI	£
135 610 0 0 550 1210 45 5 135 0	Traffic Vol, veh/h	135	610	0		_	550	1210	45	5	135	0	
nr	Future Vol, veh/h	135	610			0	550	1210	45	5	135	0	
Free	Conflicting Peds, #/hr	0	0			0	0	0	0	0	0	0	
None Free None	Sign Control	Free	Free				Free	Free		Stop	Stop	Stop	S
150	RT Channelized		,	None				Free			None		
ge.# . 0 . . 0 . . 0 .	Storage Length	150	,				,	0		,	150		
Major	Veh in Median Storage, #		0				0			0			
Major Major Major Minor	Grade, %		0				0			0			
Major1 Major2 Minor1 3 3 3 0 0	Peak Hour Factor	88	88	88		88	88	88	88	88	88	88	
Major Major Major Minor Major Minor Major Minor	Heavy Vehides, %	ω	ω	ω		_	_	_	ω	ω	ω	0	
Major1 Major2 Minor1 625 0 - 0 1625 1625 - - - 0 1625 1625 - - - 0 1000 1000 - - - - 625 625 4.145 - - - 645 545 5.445 5.545 - - 5.445 5.545 2.2285 - - - - 5.445 5.545 2.2285 - - - - - 5.445 5.545 2.2285 - - - - - - 5.445 5.545 2.2285 - - - - - - 5.445 5.545 2.2285 - - - - - - - 5.445 5.545 2.2285 - - 0 0 0 0 0 102 102 102 1 - 0 0 0 0 0 31 31 318 1 - - 0 0 0 0 0 0	Mvmt Flow	153	693	0		0	625	1375	51	6	153	0	
625 0	Major/Minor	Major1			<	lajor2			Minor1				
Harmonic Relation (S) 1006 1000 1000 1000 1000 1000 1000 100	Conflicting Flow All	625	0					0	1625	1625	347		
4.145	Stage 1		,			,	,			1000			
4.145	Stage 2												
PARTICLE STATE STA	Critical Hdwy	4.145							6.645		6.945		
2,2285	Critical Hdwy Stg 1								5.845	5.545			
CALCACIO	Cilical Howy Sig 2	2 2205							2 5205 4	0.040	3305		
18	Pot Cap-1 Maneuver	949		0		0		0	102	101	647		
HI NBLn1 NBLn2 EBL EBT WBT M8 647 949	Stage 1			0		0		0	316	318			
## NBLn1NBLn2 EBL EBT WBT ## NBLn2 EBL EBT WBT ## N	Stage 2			0		0		0	530	474			
### NBLn1 NBLn2 EBL EBT WBT ### NBLn1 NBLn2 EBL EBT WBT ### 86 647 949	Platoon blocked, %												
EB WB NB 1.7 0 37.5 MI NBLITINBLIZ EBL EBT WBT 86 647 949	Mov Cap-1 Maneuver	949							86	0	647		
EB WB NB 1.7 0 37.5 EB WB NB	Mov Cap-2 Maneuver								3 8	0			
EB WB NB 1.7 0 37.5 1.7 0 EBL EBT WBT 86 647 949 86 647 949 105.7 12.3 9.5 F B A	Stage 1								530	o c			
EB WB 1.7 0 mt NBLn1NBLn2 EBL EBT WBT 86 647 949 0.661 0.237 0.162 105.7 12.3 9.5 F B A	o ago c								000	c			
mt NBL/1 NBL/2 EBL EBT WBT 86 647 949 0.661 0.237 0.162 105.7 12.3 9.5 F B A	Approach	EB				WB			NB				
mt NBLn1NBLn2 EBL EBT WBT 86 647 949 0.661 0.237 0.162 105.7 12.3 9.5 F B A	HCM Control Delay, s	1.7				0			37.5				
mt NBLn1NBLn2 EBL EBT WB 86 647 949 - 0.661 0.237 0.162 - 105.7 12.3 9.5 - F B A -	HCMLOS								ш				
86 647 949 - 0.661 0.237 0.162 - 0.57 12.3 9.5 - F B A - 0.57	Minor Lane/Major Mvmt	NBLn11	VBLn2			WBT							
0.661 0.237 0.162 - 105.7 12.3 9.5 - F B A -	Capacity (veh/h)	86	647	949									
F B A -	HCM Lane V/C Ratio	0.661	0.237	0.162									
FBA.	HCM Control Delay (s)	105.7	12.3	9.5									
	HCM Lane LOS	П	ω	Þ									

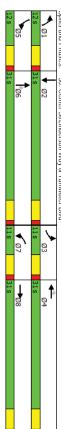
Tumwater Transportation Master Plan SCJ Alliance

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

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50: Center St/Linderson Way & Tumwater Blvc	Son W	ay & T	umwa	ter Blv	۵						PM Peak Hou	k Hour
	\	Ļ	4	1	†	/	۶	→	*	•	←	•
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	7	44		JI.	*	74	_#	→	74	J#	→	74
Traffic Volume (vph)	135	550	155	55	700	30	170	85	45	190	160	880
Future Volume (vph)	135	550	155	55	700	30	170	85	45	190	160	880
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	_		_	_		_	_		_
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)		895			1275			1023			2073	
Travel Time (s)		20.3			29.0			23.3			47.1	
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	0.94
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	ω	8		7	4		_	6		5	2	
Permitted Phases						4			6			Free
Detector Phase	ω	8		7	4	4	_	6	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	6.0	
Minimum Split (s)	11.0	31.0		11.0	31.0	31.0	11.0	31.0	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	31.0	
Total Split (%)	12.9%	36.5%		12.9%	36.5%	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	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		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	Max		None	Max	Max	None	None	None	None	None	
Intersection Summary												
	Other											
Cycle Length: 85												
Actuated Cycle Length: 70.7												
Natural Cycle: 85												
Control Type: Actuated-Uncoordinated	ordinated											

Splits and Phases: 50: Center St/Linderson Way & Tumwater Blvd



Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

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

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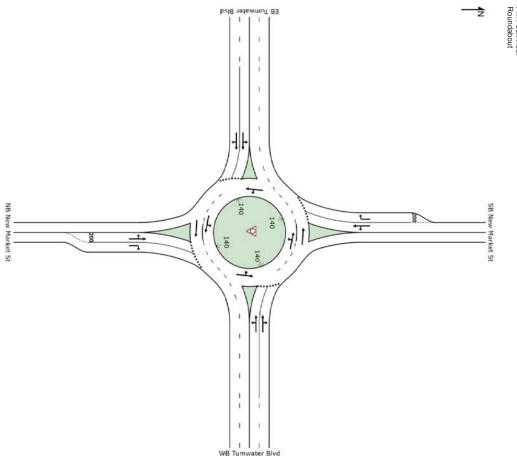
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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	Z	÷		J,	\$	74	_#	→	74	H	→	
Traffic Volume (veh/h)	135	550	155	55	700	33.	170	85	45	190	160	880
Future Volume (veh/h)	135	550	155	55	700	30	170	85	45	190	160	880
Number	ω	00	18	7	4	14	_	6	16	57	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	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	0	_	2	_	_	_	_	_	_	
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, %	2	2	2	_	_	_	_	_	_	_	_	
Cap, veh/h	284	1108	312	106	1369	612	185	258	219	185	258	219
Arrive Un Green	0.08	0.41	0.41	0.06	0.38	0.38	0.10	0.14	0.14	0.10	0.14	0.00
Sat Flow, ven/h	3442	2729	89/	1/92	35/4	1599	7/92	188	1599	7/92	1881	1599
Grp Volume(v), veh/h	144	379	371	59	745	32	181	90	48	202	170	200
O Serve(a s) s	37	110	11 0	27/1	11 0	0.0	24/1	၁ ၀ ၁ ၀	1 8	707	7 p	000
Cycle O Clear(g. c). s	2.7	11.0	11.0	2.2	11.0	0.9	6.8	2.9		7.0	5 6	0.0
Prop In Lane	1.00		0.44	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	284	719	701	106	1369	612	185	258	219	185	258	21
V/C Ratio(X)	0.51	0.53	0.53	0.56	0.54	0.05	0.98	0.35	0.22	1.09	0.66	0.00
Avail Cap(c_a), veh/h	304	719	707	158	1369	612	185	720	612	185	720	612
Unstream Filter(I)	100	1	100	1 .	100	3 .	100	100	1.00	100	1 .	000
Uniform Delay (d), s/veh	29.8	15.2	15.3	31.1	16.3	13.2	30.4	26.6	26.1	30.5	27.8	0.0
Incr Delay (d2), s/veh	1.4	2.8	2.8	4.5	1.6	0.2	60.2	0.8	0.5	93.5	2.9	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.
%ile BackOfQ(50%),veh/ln	1.	5.9	5.8	1.2	5.7	0.4	6.4	1.6	0.8	8.2	3.2	0.0
LnGrp Delay(d),s/veh	31.2	18.0	18.1	35.5	17.9	13.4	90.6	27.4	26.6	123.9	30.7	0.
LnGrp LOS	0	В	В	0	В	В	η,	0	0	η.	0	
Approach Vol, veh/h		894			836			319			372	
Approach Delay, s/veh		20.2			19.0			63.1			81.3	
Approach LOS		С			В			ш			T	
Timer		2	ω	4	5	6	7	ω				
Assigned Phs	_	2	ω	4	5	6	7	00				
Phs Duration (G+Y+Rc), s	12.0	14.3	10.6	31.0	12.0	14.3	9.0	32.6				
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	7.0	26.0	6.0	26.0	7.0	26.0	6.0	26.0				
Max Q Clear Time (g_c+l1), s	8.8	7.8	4.7	13.0	9.0	4.9	4.2	13.0				
Green Ext Time (p_c), s	0.0	1.5	0.1	7.9	0.0	1.6	0.0	7.9				
Intersection Summary												
HCM 2010 Ctrl Delay			34.8									
HCM 2010 LOS			C									

Tumwater Transportation Master Plan SCJ Alliance

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

All Ve	Approach	12	2	Oi	West:	Approach	14	4	7	North	Approach	16	0	_	East	Approach	8	œ	ω	South:		⊡ Nov	Move
All Vehicles	bach	R2	T1	2	West: EB Tumwater Blvd	bach	R2	T1	2	North: SB New Market St	bach	R2	T1	ᅜ	East WB Tumwater Blvd	bach	R2	T1	2	1: NB New Market St		Mov	Movement Performance - Vehicles
1921	891	22	842	27	Blvd	163	114	16	33	cet St	799	⇉	739	49	Blvd	67	49	2	16	ket St	veh/h	Demand Flows Total HV	mance - Ve
3.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0		2.0	2.0	2.0	2.0		0.0	0.0	0.0	0.0			VH Swol+	hicles
0.323	0.323	0.323	0.323	0.323		0.121	0.121	0.072	0.072		0.271	0.271	0.271	0.271		0.052	0.052	0.029	0.029			Deg. Satn	
4.3	3.9	4.1	3.7	10.8		7.2	5.7	6.2	13.3		3.8	3.8	3.4	10.5		7.5	5.6	6.2	13.3			Average Delay	
LOS A	LOS A	LOS A	LOS A	LOS B		LOS A	LOS A	LOS A	LOS B		LOS A	LOS A	LOS A	LOS B		LOS A	LOS A	LOS A	LOS B			Level of Service	
2.1	2.1	2.1	2.1	2.1		0.5	0.5	0.3	0.3		1.7	1.7	1.7	1.7		0.2	0.2	0.1	0.1		veh	95% Back o Vehicles	
54.9	54.9	54.9	54.9	54.2		12.0	12.0	6.6	6.6		42.7	42.7	42.7	42.4		5.1	5.1	2.6	2.6			↑ Queue Distance	
0.29	0.31	0.30	0.31	0.32		0.53	0.52	0.54	0.54		0.19	0.19	0.19	0.20		0.55	0.54	0.57	0.57			Prop. Queued	
0.40	0.38	0.36	0.38	0.39		0.69	0.66	0.76	0.76		0.35	0.32	0.34	0.38		0.68	0.65	0.76	0.76		per veh	Effective Stop Rate	
37.8	37.9	36.5	38.0	38.2		35.7	36.0	34.8	35.2		38.4	37.0	38.4	38.5		35.6	36.0	34.2	34.6		mph	Average Speed	

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 M3D).

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

Processed: Friday, Orober 23, 2015 421:53 PM
SIDA, INTERS ECTION (8.0.24.487:53 PM
Project: N.)Projects:0625 City of Turnwater/0625.17 Turnwater Transportation Master Plan\Traffic\Operations\sidra 8001456, 6017302. SCJ ALLIANCE, PLUS / 1PC

SIDRA INTERSECTION 6

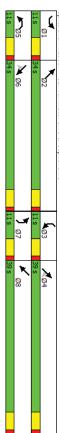
Lanes, Volumes, Timings 52: Tumwater Blvd & Capitol Blvd

Existing 2015
PM Peak Hour

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Lane Group	SEL	SET	SER	NWL	TWN	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations	JI.	→	74	-# -#	4 ↑		JI.	→	74	J,	4 ↑	
Traffic Volume (vph)	110	475	105	200	305	20	65	305	245	85	325	15
Future Volume (vph)	110	475	105	200	305	20	65	305	245	85	325	15
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
Storage Lanes	_		_	2		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)		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	0.90	0.90
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	
Protected Phases	_	6		5	2		7	4		ω	00	
Permitted Phases			6						4			
Detector Phase	_	6	6	5	2		7	4	4	ω	00	
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	34.0	34.0	11.0	34.0			39.0	39.0	11.0	39.0	
Total Split (s)	11.0	34.0	34.0	11.0	34.0			39.0	39.0	11.0	39.0	
Total Split (%)	11.6%	35.8%	35.8%	11.6%	35.8%			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	
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	Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes			Yes	Yes	Yes	Yes	
Recall Mode	None	Max	Max	None	Max			None	None	None	None	
Intersection Summary												
Area Type:	Other											
Cycle Length: 95												
Actuated Cycle Length: 82.1												
Natural Cycle: 95												

Splits and Phases: 52: Tumwater Blvd & Capitol Blvd

Control Type: Actuated-Uncoordinated



Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

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

Existing 2015
PM Peak Hour

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Movement	SEL	SET	SER	NWL	TWN	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations	H	→	-34	# #	↑		_#	→	-1	H	*	
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	_	6	16	ۍ ت	2	12	7	4	14	ω	00	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1845	1881	1881	1900	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	_	_	_	2	2	0	_	_	_	_	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, %	ω	ω	ω	_	_	_	_	_	_	_	_	_
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
Grp Volume(v), veh/h	122	528	39	222	177	184	72	339	జ్ఞ	94	185	193
Grp Sat Flow(s),veh/h/ln	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	<u>3.1</u>	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	Ω	13.3	1.3	4.1	6.9	7.0
Prop In Lane	1.00		1.00	1.00		0.12	1.00		1.00	1.00		0.09
Lane Grp Cap(c), veh/h	132	669	569	261	648	668	107	461	392	120	451	467
V/C 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_a), veh/h	132	669	569	261	648	668	134	800	680	134	760	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
Upstream Filter(I)	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
Incr 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
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.7	12.1	0.6	3.2	2.9	<u>3</u>	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	T	C	В	т	В	В	D	C	С	т	С	0
Approach Vol, veh/h		689			583			444			472	
Approach Delay, s/veh		41.8			34.3			31.5			31.7	
Approach LOS		D			С			С			С	
Timer		2	ယ	4	5	6	7	8				
Assigned Phs	_	2	ω	4	5	6	7	∞				
Phs 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 (g_c+l1), 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	<u>ω</u>	0.0	4.7				
Intersection Summary												
HCM 2010 Ctrl Delay			35.5									
HCM 2010 LOS			D									

Tumwater Transportation Master Plan SCJ Alliance

Lanes, Volumes, Timings 53: 65th Ave & Henderson Blvd

Existing 2015
PM Peak Hour

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	J#	₩		_#	₩			\$			\$	
Traffic Volume (vph)	2	845	55	65	525	_	25	0	45	_	0	0
Future Volume (vph)	2	845	55	65	525	_	25	0	45	_	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
Storage Lanes	_		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	0.91	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 (%)												
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			00			4	
Permitted Phases	2			6			00			4		
Detector Phase	2	2		6	6		00	00		4	4	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	27.5	27.5		27.5	27.5		12.5	12.5		27.5	27.5	
Total Split (s)	52.5	52.5		52.5	52.5			27.5			27.5	
Total Split (%)	65.6%	65.6%		65.6%	65.6%		34.4%	34.4%			34.4%	
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 Optimize?												
Recall Mode	Max	Max		Max	Max		None	None		None	None	
Intersection Summary												
Area Type:	Other											
Cycle Length: 80												
Actuated Cycle Length: 74.1	_											
Natural Cycle: 80												
Control Type: Actuated-Uncoordinated	coordinated											

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

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52.5 s		27.5 s
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52.5 s	77.	200

Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

HCM 2010 Signalized Intersection Summary 53: 65th Ave & Henderson Blvd

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PM Pe	sting
ek Hour	2015

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		¥		_#	❖			₽			₽	
Traffic Volume (veh/h)	2	845	55	65	525	_	25	0	45	_	0	0
Future Volume (veh/h)	2	845	55	65	525	_	25	0	45	_	0	0
Number	5	2	12	_	6	16	ω	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_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1900	1881	1881	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	2	929	60	71	577	_	27	0	49	_	0	0
Adj No. of Lanes	_	_	0	_	_	0	0	_	0	0	_	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	_	_	_	_	_	_	0	0	0	0	0	0
Cap, veh/h	667	1334	86	397	1432	2	116	14	96	263	0	0
Arrive On Green	0.76	0.76	0.76	0.76	0.76	0.76	0.09	0.00	0.09	0.09	0.00	0.00
Sat Flow, veh/h	840	1748	113	573	1877	ω	414	150	1023	1581	0	
Grp Volume(v), veh/h	2	0	989	71	0	578	76	0	0	_	0	0
Grp Sat Flow(s),veh/h/ln	840	0	1861	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		0.00	0.36		0.64	1.00		0.00
Lane Grp Cap(c), veh/h	667	0	1420	397	0	1435	227	0	0	263	0	0
V/C 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	0	637	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 Delay (d) sheh	2 7	0.00	2 C	0 .00	0.00	3 .00	37.0	0.00	0.00)	0.00	0.00
Incr Delay (d2) s/yeh	0.0	0.0	2 0	10	0.0	0.4	10	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 BackOfQ(50%),veh/ln	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	0.0	25.8	0.0	0.0
LnGrp LOS	Α		Α	В		Α	С			С		
Approach Vol, veh/h		991			649			76			_	
Approach Delay, s/veh		6.6			4.1			28.1			25.8	
Approach LOS		Þ			Þ			C			С	
Timer	_	2	ယ	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 Q Clear Time (g_c+l1), 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 Ctrl Delay			6.6									
HCM 2010 LOS			A									
			:									

Tumwater Transportation Master Plan SCJ Alliance

Lanes, Volumes, Timings
54: Henderson Blvd & Tumwater Blvd

Existing 2015
PM Peak Hour

					ncoordinated	Control Type: Actuated-Uncoordinated
						Natural Cycle: 90
					9.8	Actuated Cycle Length: 89.8
						Cycle Length: 90
					Other	Area Type:
						Intersection Summary
Max	Max	None	None		Max	Recall Mode
						Lead-Lag Optimize?
						Lead/Lag
4.0	4.0	4.0			4.0	Total Lost Time (s)
0.0	0.0	0.0			0.0	Lost Time Adjust (s)
	1.0	1.0	1.0		1.0	All-Red Time (s)
	3.0	3.0	3.0		3.0	Yellow Time (s)
	33.3%	17.8%	17.8%		48.9%	Total Split (%)
	30.0	16.0	16.0		44.0	Total Split (s)
20.5	30.0	10.5	10.5		20.5	Minimum Split (s)
6.0	6.0	6.0	6.0		6.0	Minimum Initial (s)
						Switch Phase
2	4	8	00		2	Detector Phase
4						Permitted Phases
2	4	00	00		2	Protected Phases
pm+ov	NA	NA	Split		Prot	Turn Type
						Shared Lane Traffic (%)
1%	1%	1%	1%	1%	1%	Heavy Vehicles (%)
0.91	0.91	0.91	0.91	0.91	0.91	Peak Hour Factor
	41.1	46.6			60.8	Travel Time (s)
	2111	2394			3122	Link Distance (ft)
	35	35			35	Link Speed (mph)
Yes				Yes		Right Turn on Red
			25		25	Taper Length (ft)
_			0	0	_	Storage Lanes
100			0	0	0	Storage Length (ft)
1900	1900	1900	1900	1900	1900	Ideal Flow (vphpl)
325	195	165	20	10	650	Future Volume (vph)
325	195	165	20	10	650	Traffic Volume (vph)
74	→	2 ,			- <	Lane Configurations
SBR	SBT	NBT	NBL	EBR	EBL	Lane Group
	4	-	-	•		

Splits and Phases: 54: Henderson Blvd & Tumwater Blvd

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Tumwater Transportation Master Plan
Synchro 9 Report
SCJ Alliance
6/10/2016

HCM 2010 Signalized Intersection Summary 54: Henderson Blvd & Tumwater Blvd

PM Peak Hour

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	-	1	۶	→	•	*	
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations	₹	>	>	4	→	-4	
Future Volume (veh/h)	650	1 0 0	20	165	195	325 325	
Number	о	12	. ω	- ∞	4	14	
Ped-Bike Adi(A pbT)	1.00	1.00	1.00	c	c	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	5 =	22	. 20	214	236	
Auj No. of Laries Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	
Percent Heavy Veh, %	0	0	_	_	_	:	
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	
Grp Volume(v), veh/h	726	0	203	0	214	236	
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	>	547	1.00	
V/C Ratio(X)	0.91	0.00	0.85	0.00	0.39	0.20	
Avail Cap(c_a), veh/h	800	3 0	251	3 0	547	1179	
Upstream Filter(I)	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	
%ile BackOfO(50%) veh/ln	20.1	0.0	6.4	0.0	4.0	5.0	
LnGrp Delay(d),s/veh	39.1	0.0	60.5	0.0	27.5	4.0	
LnGrp LOS	D		m		C	Þ	
Approach Vol, veh/h Approach Delay s/yeh	726			203	450		
Approach LOS	0			E S	B :		
Timer		2	ω	4	57	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			120
Max O Clear Time (g. c+l1). s		35 6		10.1			11.5
Green Ext Time (p_c), s		1.4		2.2			0.1
Intersection Summary							
HCM 2010 Ctrl Delay			34.4				
HCM 2010 LOS			C				
Notes							

Tumwater Transportation Master Plan SCJ Alliance

HCM 2010 TWSC 55: Henderson Blvd & Trails End Dr

Existing 2015
PM Peak Hour

	,						
int Delay, s/ven 3	òx						
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	
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	_	_	_	_	
Mvmt 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 Stg 1	5.4						
Critical Hdwy Stg 2	5.4						
Follow-up Hdwy	3.5	3.3			2.209		
Pot Cap-1 Maneuver	465	820		í	1293	í	
Stage 1	818						
Stage 2	696						
Platoon blocked, %							
Mov Cap-1 Maneuver	422	820			1293		
Mov 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	В						
Minor Lane/Major Mvmt	NET	NERNWLn1 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			Α				
		- 08 03					

Tumwater Transportation Master Plan SCJ Alliance

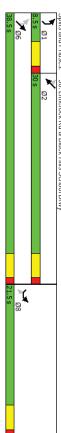
Synchro 9 Report 6/10/2016

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

Existing 2015
PM Peak Hour

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Lane Group	SEL	SER	NEL	NET	SWT	SWR	
Lane Configurations	_#	-4	JI.	→	→	74	
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			350	
Storage Lanes	_	_	_			_	
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	00		_	6	2		
Permitted Phases		00	6			2	
Detector Phase	00	00	_	6	2	2	
Switch Phase							
Minimum Initial (s)	7.0	7.0		7.0		7.0	
Minimum Split (s)	21.5	21.5		24.5		27.5	
Total Split (s)	21.5	21.5	8.5			30.0	
Total Split (%)		35.8%				50.0%	
Yellow Time (s)		3.5				3.5	
All-Red Time (s)	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	
Lead/Lag			Lead			Lag	
Lead-Lag Optimize?			Yes		Yes	Yes	
Recall Mode	None	None	None	Max	None	None	
Intersection Summary							
	Other						
Cycle Length: 60							
Actuated Cycle Length: 54.5							
Natural Cycle: 60							
Control Type: Actuated-Uncoordinated	ordinated						

Splits and Phases: 56: Littlerock Rd & Black Hills School Drwy



Tumwater Transportation Master Plan SCJ Alliance

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

Existing 2015
PM Peak Hour

Parking Bus, Adi	-1 :00	1.00	1.00	1.00	1.00	1.00				
Adj Sat Flow, veh/h/ln	1900	1900	1881	1881	1881	1881				
Adj Flow Rate, veh/h	5	51	=1	168	411	53				
Adj No. of Lanes	_	_	_	_	_	_				
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				
Percent Heavy Veh, %	0	0	_	_	_	_				
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				
Grp Volume(v), veh/h	5	5	1	168	411	53				
Grp Sat Flow(s),veh/h/ln	1810	1615	1792	1881	1881	1599				
Q Serve(g_s), s	0.1	0.1	0.1	1.0	4.1	0.5				
Cycle Q Clear(g_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 Grp Cap(c), veh/h	د	30	715	1460	1245	1059				
V/C Ratio(X)	0.15	0.17	0.02	0.12	0.33	0.05				
Avail Cap(c_a), ven/n	102	100	300	100	1 00	1059				
HCM Platoui Katio	3 .	1.00	1 .	1.00	100	1.00				
Uniform Delay (d), s/yeh	21.00	21.00	22	1 2	بر د د د	26				
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 BackOfQ(50%),veh/ln	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	Α	Α	Α	Α				
Approach Vol, veh/h	10			179	464					
Approach Delay, s/veh	23.5			1.4	3.3					
Approach LOS	C			Α	A					
Timer	_	2	ω	4	5	6	7	<u></u>		
Assigned Phs	1	2				6		8		
Phs Duration (G+Y+Rc), s	5.0	33.5				38.5		5.3		
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 (g_c+l1), 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			<u>3</u>							
HCM 2010 LOS			>							

Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

> HCM 2010 TWSC 57: Center St & 76th Ave

Existing 2015
PM Peak Hour

Intersection Int Delay, slveh 2.3 Movement Traffic Vol, veh/h		EBT 10	EBR	WBL	WBT 10	WBR 20	NBL NBL	NBT 245	2	NBR 1	(0)	SBL
Traffic Vol, veh/h Future Vol. veh/h	50	10		10	10	20			245 245	245 1 245 1	- -	1 10 1 10
Conflicting Peds, #/hr	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	Free Free Free
RT Channelized			None			None					None -	None -
Storage Length												
Veh in Median Storage, #		0			0				0	0 -	0 -	0 0
Grade, %		0			0					0	0 -	0 -
Peak Hour Factor	92	92	92	92	92	92	92	2	2 92		92	92 92 92 1
Heavy Vehicles, %	ω	ω	ω	11	=	1		_		_		1 1 3
Mvmt Flow	54	⇉	_	===	=	22		_	1 266			266 1 11 3
Major/Minor	Minor2			Minor1			Major1	ĭ	Z	ĭ	or1 Major2	~
Conflicting Flow All	665	650	359	655	671	267	380	8	0 0		0 0	0 0
Stage 1	380	380		269	269							
Stage 2	7.13	6.53	6.23	386 7.21	6.61	6.31	4.11	⇉ .	⊒ . 			
Critical Hdwy Stg 1	6.13	5.53		6.21	5.61			1				
Critical Hdwy Stg 2	6.13	5.53		6.21	5.61							
Follow-up Hdwy			3.327	3.599	4.099	3.399	2.209	9				
Pot Cap-1 Maneuver	3/2	38/	683	36/	300	067	1184	4			12	
Stage 1	640	612		717	670							
Platoon blocked. %	720	001		020	0							
Mov Cap-1 Maneuver	350	382	683	355	362	750	11	1184				
Mov Cap-2 Maneuver	350	382		355	362							
Stage 1	639	605		716	669							
Stage 2	687	683		601	579	١.						
Approach	EB			WB				NB	NB	NB	NB SB	
HCM Control Delay, s	17.3			13.2				0	0	0		
HCM LOS	C			В								
Minor Lane/Major Mvmt	NBL	NBT	NBR EB	BR EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1184			485	1291							
HCM Cantol Dolay (c)	0.001	، د	, c.	13.3	800.0							
HCM Control Delay (s)	> 00	> 0		13.2	> .~	> 0						
HCM 95th %tile O(veh)	>)			07 03	5 7							

Tumwater Transportation Master Plan SCJ Alliance

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

Existing 2015
PM Peak Hour

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Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations	JI.	→	74	JI.	₩			\$ →		J,	¥	
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	57	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	150		0
Storage Lanes	_		_	_		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)		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	0.87	0.87
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	3%	3%	3%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases	_	6			2			4			00	
Permitted Phases	6		6	2			4			00		
Detector Phase	_	6	6	2	2		4	4		8	00	
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	10.5	25.5	25.5	26.5	26.5		33.5	33.5		33.5	33.5	
Total Split (s)	11.0	56.5	56.5	45.5	45.5		33.5	33.5			33.5	
Total Split (%)	12.2%	62.8%	62.8%	50.6%	50.6%		37.2%	37.2%			37.2%	
Yellow Time (s)	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	
Lost Time Adjust (s)	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	
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?	Yes			Yes	Yes							
Recall Mode	None	Max	Max	Max	Max		None	None		None	None	
Intersection Summary												
Area Type: (Other											
Cycle Length: 90												
Actuated Cycle Length: 77.7												
Natural Cycle: 90												
Control Type: Actuated-Uncoordinated	ordinated											

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



Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

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

Existing 2015
PM Peak Hour

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Movement	SEL	SET	SER	NWL	TWN	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations	_74	→	-14	_#	৵			↔		_#	₩	
Traffic Volume (veh/h)	105	815	10	2	510	110	3	رى ا	ı vı	140	ı ОП [*]	50
Huture volume (ven/n)	105	, d	10	п /	ر ان ان	3 0	1 <u>2</u>	<u>.</u> ر	, u	3 0	o U	10
Number Initial O (Ob), veh	o <u>-</u>	0 0	0 16	o 5	0 2	0 12	0 ~	0 4	0	o ω	> \alpha	0 8
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00	4	1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1881	1863	1863	1900	1900	1845	1900	1881	1881	1900
Adj Flow Rate, veh/h	121	937	=	2	586	126	17	6	6	161	6	57
Adj No. of Lanes	_	_	_	_	_	0	0	_	0	_	_	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, %	_	_	_	2	2	2	ω	ω	ω	_	_	_
Cap, veh/h	433	1342	1141	353	851	183	163	57	37	302	21	195
Sat Flow yearsh	1700	1991	1500	500	1/0.5/	220	627	478	275	1/10	15/	1//69
Grp Volume(v), veh/h	121	937	11	2	0	712	29	0 420	0 2	161	0	63
Grp Sat Flow(s),veh/h/ln	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	5	1.00	1.00		0.18	0.59	,	0.21	1.00		0.90
Lane Grp Cap(c), ven/n	433	1342	2 4	353	200	0.35	25/	200	200	302	8 0	216
Avail Cap(c a) veh/h	457	1340	1141	252	0.00	1035	633	0.00	0.00	666	0.00	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(I)	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	8.3	5.9	3.0	11.7	0.0	10.8	27.3	0.0	0.0	29.8	0.0	28.0
Incr Delay (d2), s/veh	0.7	3.0	0.0	0.0	0.0	3.7	0.1	0.0	0.0	0.5	0.0	0.3
%ile BackOfO(50%) veh/ln	0.0	11 0.0	0.0	0.0	0.0	10.0	Э С	0.0	0.0	2 0	0.0	1 0
LnGrp Delay(d),s/veh	8.4	8.9	3.0	11.7	0.0	14.5	27.4	0.0	0.0	30.4	0.0	28.2
LnGrp LOS	Α	Α	Α	В		В	С			С		C
Approach Vol, veh/h		1069			714			29			224	
Approach Delay, s/veh		8.8			14.5			27.4			29.8	
Approach LOS		A			В			С			С	
Timer		2	ω	4	5	6	7	8				
Assigned Phs	_	2		4		6		00				
Phs Duration (G+Y+Rc), s	10.0	46.5		15.0		56.5		15.0				
Change Period (Y+Rc), 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 (g_c+l1), 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			В									

Tumwater Transportation Master Plan SCJ Alliance

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

Existing 2015
PM Peak Hour

HCM 95th %tile Q(veh)	HCM Control Delay (s)	HCM Lane V/C Ratio	Capacity (veh/h)	Minor Lane/Major Mvmt	HCM LOS	HCM Control Delay, s	Approach	Siafie 7	Stage 2	Mov Cap-2 Maneuver	Mov Cap-1 Maneuver	Platoon blocked, %	Stage 2	Stage 1	Pot Cap-1 Maneuver	Follow-up Hdwy	Critical Hdwy Stg 2	Critical Hdwy Stg 1	Critical Hdwy	Stage 2	Stage 1	Conflicting Flow All	Major/Minor	WORTH Flow	Heavy Venicles, %	Peak Hour Factor	Grade, %	Veh in Median Storage, #	Storage Length	RT Channelized	Sign Control	Conflicting Peds, #/hr	Future Vol, veh/h	Traffic Vol. veh/h	Movement	Int Delay, s/veh	Intersection
0 A	9./	0.001	770	NWL	С	23.1	EB	10,	767	200	61		579	239			6.12	6.12	7.12	463	1158	1621	Minor1	_		25					Stop	0		_	EBL	2.2	
, 2	· c			TWN				007	550	ر 89	89		560	270			5.52	5.52	6.52	471	1158	1629		_	۷ /	95	0	0		í	Stop	0		_	EBT		
				NWR E							344				344	3.318	,	,	6.22			884		=	. ~	95		,		None	Stop	0	10	10	EBR		
0.2	23.1			BLn1W																			-														
0.5	04.3			NWR EBLn1WBLn1W	C	16.7	WB	201	201	500	71		238	581		- 1	6.11	6.11	7.11	1164	463	1627	/linor2	=	: _	2, 95				ï	Stop	0	10	10	WBL		
0.7		0.192		VBLn2				00.7	200	565	90		272	566			5.51	5.51	6.51	1158	463	1621		c		95	0	0				0	0	0	WBT		
0.4		0.125	1099	SEL							603				603	3.309	,		6.21			461		-	: -	95		·	300	None	Stop	0	110	110	WBR		
				SET																			×														
				SER		1.2	SE				1099				1099	2.209	,		4.11			468	lajor1	13/	-	95			250	ï	Free	0	130	130	SEL		
															,		ï		ï			0		884	-	, %	0	0				0	840	840	SET		
															,		·		·	·		0		0	· _	95				None	Free	0	0	٥	SER		
						0	WN				770				770	2.209			4.11			884	Major2	_		95					Free	0		_	NWL		
																			,	,	,	0		453	i _	95	0	0			Free	0	430	430	TWN		
											,											0		-0		95		,		None	Free	0	35 5	1,5	NWR		

Synchro 9 Report 6/10/2016

Tumwater Transportation Master Plan SCJ Alliance

HCM 2010 TWSC 60: Kimmie St & 83rd Ave

Existing 2015
PM Peak Hour

	5		30 30	0 15 15	1 07	
	-		30		,	60
	15				5	60
Conflicting Peds, #/hr 0	0		0		0	0
	Stop		Free		Free	Free
zed	None			- None		None
'eh in Median Storage, # 0			0			0
			0			0
r Factor	82		82		82	82
0`	ω		9		ω	ω
	18		37	7 18	6	73
Najor/Minor Minor1			Major1		Major2	
low All	46		0		55	
						0
				, c		. 0
	6.23					0
itical Hdwy Stg 1 5.43					4.13	0
Critical Hdwy Stg 2 5.43					4.13	0
	3.327				4.13	0
uver	1021				4.13	0
Stage 1 974					4.13 - - - 2.227 1544	0
Stage 2 936					4.13 4.13 - - - 2.227 1544	
Platoon blocked, %					4.13 4.13 - - 2.227 1544	
Nov Cap-1 Maneuver 858	1021				4.13 4.13 - - 2.227 1544	
·					4.13 4.13 	
					4.13 4.13 - - 2.227 1544 - -	
Stage 2 932					4.13 4.13 2.227 1544 1544	
					4.13 2.227 1544 1544	
					4.13 4.13 2.227 1544	
HCM Control Delay, s 9.4			Z		4.13 4.13 2.227 1544 1544 1544 SB	
			0 8		4.13 4.13 2.227 1544 1544 1544 88	
			O.B.		4.13 4.13 2.227 1544 1544 1544 1564	
inor Lane/Major Mvmt NBT	VBRWBLn1		0 B		4.13 4.13 2.227 1544 1544 1544 1540 8B	
-	- 894	SEP			4.13 4.13 2.227 1544 1544 1544 1540 8B	
Ratio	0000	SBL 1544			4.13 2.227 1544 1544 1544 1546 88 88	
HCM Control Delay (s) -	- U.U8Z	SBL 1544			4.13 4.13 2.227 11544 1.544 1.544 1.549 8.8	
	9.4	9 - 1,0			4.13 4.13 2.227 1544 1544 1564 0.6	
IOM 95th %tills O(voh)	9.4 A	SBL 1544 0.004 7.3			4.13 2.227 1544 1544 1548 88 88	

Tumwater Transportation Master Plan SCJ Alliance

HCM 2010 TWSC 61: 83rd Ave & Center St

Existing 2015
PM Peak Hour

nt Delay, s/veh 7.8	ω							
Novement	EBL	EBT			WBT	WBR	SBL	SBR
raffic 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	Stop	Stop
RT Channelized		None				None		None
storage Length							0	
/eh in Median Storage, #	,	0			0		0	
Grade, %		0			0		0	
eak Hour Factor	88	88			88	88	88	88
Heavy Vehicles, %	_	_			ω	ω	_	_
Wymt Flow	80	28			⇉	102	176	80
Лаjor/Minor	Major1			7	Najor2		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 Stg 1		·					6.11	
Critical Hdwy Stg 2		í			i		6.11	
ollow-up Hdwy	2.209						3.509	3.309
ot Cap-1 Maneuver	1481	,					704	1004
Stage 1							950	
Stage 2	,	í			ì		816	
Platoon blocked, %								
Nov Cap-1 Maneuver	1481						674	1004
Mov Cap-2 Maneuver		,					674	
Stage 1	,	í			í	·	898	
Stage 2							771	
hpproach	EB				WB		SB	
ICM Control Delay, s	5.6				0		12.2	
HCM LOS							В	
//Inor Lane/Major Mvmt	EBL	EBT	WBT W	WBR SBLn1				
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	Α	A		В				
	٥			- 1.5				

Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

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

Existing 2015
PM Peak Hour

Tumwater Transportation Master Plan SCJ Alliance

Splits and Phases: 62: 88th Ave & Old Hwy 99

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HCM 2010 Signalized Intersection Summary 62: 88th Ave & Old Hwy 99

Existing 2015
PM Peak Hour

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Novement	SEL	SET	SER	NWL	TWN	NWR	NEL	NET	NER	SWL	SWT	SWR
ane Configurations	_3(->	-34	_#	æ>		_3(₽÷			\$ →	
raffic Volume (veh/h)	0	670	175	5	270	0	180	ω,	25	2	ъ	_
uture Volume (veh/h)	0	670	175	1 57	270	0	180	. თ	25	, 2	, сл	, -
lumber	o <u> </u>	0 6	16	o 01	2	12	0 7	4 0	14	Σ ω	o 00	18
niliai U (Ub), ven Ped-Rike Adi(A_nhT)	3 0	c	3 0	100	c	1 80 o	100	c	100	3	c	<u> </u>
Parking Bus, Adi	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
\dj Sat Flow, veh/h/ln	1863	1881	1881	1881	1881	1900	1845	1847	1900	1900	1863	1900
Adj Flow Rate, veh/h	0	744	194	6	300	0	200	с л	28	2	σı	_
Adj No. of Lanes	_	_	_	_	_	0	_	_	0	0		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
an veh/h	155	1131	961 -	250 -	1121	o -	412	25	25.1	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
at Flow, veh/h	1075	1881	1599	601	1881	0	1391	243	1363	211	1319	219
3rp Volume(v), veh/h	0	744	194	6	300	0	200	0	33	8	0	0
Grp Sat Flow(s),veh/h/ln	1075	1881	1599	601	1881	0	1391	0	1607	1748	0	0
Σerve(g_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
ane Grn Can(c) veh/h	- - - - - - - - - - - - - - - - - - -	1132	961	359	1131	0.00	412	>	296	419	0	0.12
//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
\vail Cap(c_a), veh/h	155	1131	961	359	1131	0	813	0	759	901	0	0
ICM 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
pstream Filter(i)	0.00	1.00	.00	1.00	1.00	0.00	100	0.00	15.00	15.00	0.00	0.00
ncr Delay (d2), s/veh	0.0	ა <u>.</u>	0.5	0.1	0.6	0.0	0.9	0.0	0.0	0.0	0.0	0.0
nitial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	7.1	1.3	0.1	1.9	0.0	2.5	0.0	0.4	0.1	0.0	0.0
nGrp Delay(d),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
nGrp LOS		Α	A	В	A		В		В	В		
Approach Vol, veh/h		938			306			233			8	
Approach Delay, s/veh		8.2			5.1			18.5			15.6	
Approach LOS		Α			A			В			В	
imer	_	2	ယ	4	5	6	7	00				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		34.0		12.6		34.0		12.6				
Change Period (Y+Rc), s		6.0		4.0		6.0		4.0				
Max Green Setting (Gmax), s		28.0		22.0		28.0		22.0				
Max Q Clear Time (g_c+l1), s		14.5		8.3		14.2		2.2				
Green Ext Time (p_c), s		5.8		0.6		5.9		0.7				
ntersection Summary												
HCM 2010 Ctrl Delay			9.2									
10M 2010 LOS			>									

Tumwater Transportation Master Plan SCJ Alliance

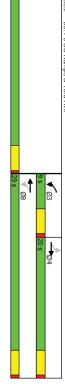
Synchro 9 Report 6/10/2016

Lanes, Volumes, Timings 63: I-5 SB Ramps & 93rd Ave

Existing 2015
PM Peak Hour

Lane Group	EBL 🕨	EBT ↓	EBR ✓	WBL	WBT	WBR /	NBL 🅕	NBT →	NBR		SBL 💉
Lane Configurations Traffic Volume (vnh)	5	ÿ ‡	20	1 An J	125	0	O	O		>	
Future Volume (vph)	0	295	30	145	125	0	0	0		0	0 500
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900		1900	
Storage Length (ft)	0		0	150		0	0			0	
Storage Lanes	0		0	_		0	0			0	
Taper Length (ft)	25			25			25				25
Right Turn on Red			Yes			Yes				Yes	
Link Speed (mph)		30			40			30			
Link Distance (ft)		1124			936			1099			
Travel Time (s)		25.5			16.0			25.0			
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
Heavy Vehides (%)	1%	1%	1%	9%	9%	9%	0%	0%		0%	
Shared Lane Traffic (%)											
Turn Type		NA		pm+pt	N						Perm
Protected Phases		4		ω	00						
Permitted Phases	4			00							6
Detector Phase	4	4		ω	00						6
Switch Phase											
Minimum Initial (s)	4.0	4.0		4.0	4.0						4.0
Minimum Split (s)	20.0	20.0		8.0	20.0						20.0
Total Split (s)	20.0	20.0		9.0	29.0						
Total Split (%)	33.3%	33.3%		15.0%	48.3%						
Yellow Time (s)	3.5	3.5		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						
Total Lost Time (s)		4.0		4.0	4.0						
Lead/Lag	Lag	Lag		Lead							
Lead-Lag Optimize?	Yes	Yes		Yes							
Recall Mode	None	None		None	None						Max
Intersection Summary											
Area Type:	Other										
Cycle Length: 60											
Actuated Cycle Length: 56.6	6										
Natural Cycle: 60	:										
Control Type: Actuated-Uncoordinated	coordinated										

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



Tumwater Transportation Master Plan SCJ Alliance

HCM 2010 Signalized Intersection Summary 63: I-5 SB Ramps & 93rd Ave

Existing 2015
PM Peak Hour

Movement EBL EBI EBR WBL WBI WBR NBL NBI NBR SEL SBI SBI Tariffic Volume (vehith) 2-95 30 145 125 0 0 0 0 0 0 285 Mumber 120		1	ţ	4	1	t	1	٠	→	*	•	+	4
	Novement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A) 0 295 30 145 125 0 0 0 500 0 1 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 1 100 1 0 1 0 1 0 1 0	ane Configurations		₽		J.	→						⊅	-34
) 0 295 30 145 125 0 0 0 0 500 0 100 100 100 100 100 100	raffic Volume (veh/h)	0	295	30	145	125	0	0	0	0	500	0	285
7	uture Volume (veh/h)	0	295	30	145	125	0	0	0	0	500	0	285
1.00 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	lumber	7	4	14	ω	00	18				_	6	16
1.00	nitial Q (Qb), veh	0	0	0	0	0	0				0	0	0
1.00 1.00	ed-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
1900 1881 1900 1743 1743 0 1900 1827 1 0 33 34 165 142 0 56 1 1 0 1827 1 1 1 0 1828 0.88 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00	Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
0 335 34 165 142 0 568 0 0 1 1 0 1 1 0 0 108 0.88 0.88 0.88 0.88	\dj Sat Flow, veh/h/ln	1900	1881	1900	1743	1743	0				1900	1827	1827
0 1 0 1 0 1 0 1 0 0 1 0 0 0 0 0 0 0 0 0	\dj Flow Rate, veh/h	0	335	34	165	142	0				568	0	131
0.88 0.88 0.88 0.88 0.88 0.88 0.88 0.88	\dj No. of Lanes	0	_	0	_	_	0				0	_	_
6 1 1 1 1 9 9 9 0 4 4 4 4 1 315 69 0 0 812 00 1740 00 1 100 1700 1700 1700 1700 17	eak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88				0.88	0.88	0.88
0 402 41 315 689 0 812 0 0 124 0.09 0.00 0.40 0.41 0.00 0.00 0.41 0.00 0.43 315 689 0 0 812 0 0 812 0 0 812 0 0 812 0 0 0 812 0.00 0.41 0.00 0.00 0.44 0.315 753 0 0 0.00 0.41 0.00 0.00 0.00 0.00 0.00	ercent Heavy Veh, %	_	_	_	9	9	0				4	4	4
0.00 0.04 0.24 0.09 0.40 0.00 0.00 0.00 0.00 0.00 0.0	Cap, veh/h	0	402	41	315	689	0				812	0	725
0 1681 171 1660 1743 0 1740 0 1 0 0 0 369 165 1450 1743 0 1740 0 1 0 0 0 1851 1660 1743 0 1740 0 1 0 0 0 0 11.0 4.1 3.1 0.0 15.0 0.0 0 0 0 0 11.0 4.1 3.1 0.0 15.0 0.0 0 0 0 0 0 443 315 689 0 812 0 0 0 0 512 315 753 0 812 0 0 0 0 512 315 753 0 812 0 0 0 0 0 1.00 1.00 1.00 1.00 1.00 1.00	Arrive On Green	0.00	0.24	0.24	0.09	0.40	0.00				0.47	0.00	0.47
hin 0 0 389 1165 1142 0 568 0 1740 1740 0 1851 1660 1743 0 1740 0 1 1750 0	sat Flow, veh/h	0	1681	171	1660	1743	0				1740	0	1553
Win 0 1851 1660 1743 0 1740 0 1740 0 1740 0 1740 0 1740 0 1740 0 1740 0 1740 0 1740 0 1740 0 1740 0 1740 0 1750 0 0 0 150 0 0 150 0 0 150 0 0 150 0 0 150 0 0 1 150 0 0 1 150 0 0 1 150 0 0 1 150 0 <t< td=""><td>3rp Volume(v), veh/h</td><td>0</td><td>0</td><td>369</td><td>165</td><td>142</td><td>0</td><td></td><td></td><td></td><td>568</td><td>0</td><td>131</td></t<>	3rp Volume(v), veh/h	0	0	369	165	142	0				568	0	131
00 00 1110 41 31 00 150 00 150 00 110 41 31 00 150 00 100 110 4.1 31 0.0 150 00 110 4.1 31 0.0 150 0.0 110 4.1 31 0.0 150 0.0 110 0 100 1100 100 100 100 100 100	Grp Sat Flow(s),veh/h/ln	0	0	1851	1660	1743	0				1740	0	1553
Mn 00 0.0 11.0 4.1 3.1 0.0 15.0 0.0 1.00 0.00 1.00 0.00 1.00 0.00 1.00 0.00 1.00 0.00 1.00 0.00 1.00 0.00 0.00 0.83 0.52 0.21 0.00 0.00 1.00 0.00 0.00 1.00 1.0	2 Serve(g_s), s	0.0	0.0	11.0	4.1	<u>ω</u>	0.0				15.0	0.0	2.8
hh 0.00 0.09 1100 0.00 1.00 1.00 1.00 1.00	Cycle Q Clear(g_c), s	0.0	0.0	11.0	4.1	<u>ω</u>	0.0				15.0	0.0	2.8
/h 0 0 443 315 689 0 812 0 0 0 443 315 689 0 812 0 0 0 512 315 753 0 812 0 0 0 512 315 753 0 812 0 0 0 0 1.00 1.00 1.00 1.00 1.00 0.00 0.00 1.00 1.00 1.00 0.00 1.00 1.00 eh 0.0 0.0 1.00 1.00 0.00 0.0 2.0 0.0 eh 0.0<	Prop In Lane	0.00		0.09	1.00		0.00				1.00		1.00
0.00 0.00 0.83 0.52 0.21 0.00 0.70 0.00 0.70 0.00 0.70 0.00 0.70 0.00 0.70 0.00 0.70 0.00 0.70 0.00 0.70 0.00 0.70 0.00 0.70 0.00 0.70 0.00 0.70 0.00 0.70 0.00 0.70 0.00 0	_ane Grp Cap(c), veh/h	0	0	443	315	689	0				812	0	725
1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00	//C Ratio(X)	0.00	0.00	0.83	0.52	0.21	0.00				0.70	0.00	0.18
1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00	wall Cap(c_a), veh/h	0	0	512	315	753	0				812	0	725
reth 0.00 0.00 1.00 1.00 0.00 1.20 0.00 0.0	ICM Platoon Ratio	0.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Cell Co.	Jpsilediii Filiei(i)	0.00	0.00	200	1/10	115	0.00				13.00	0.00	0.0
eh 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	ncr Delay (d2) s/yeh	0.0	0.0	100	16	01	0.0				50	0.0	O ч
eh/ln 0.0 0.0 6.8 2.0 1.5 0.0 8.2 0.0 0.0 0.0 30.9 16.5 11.7 0.0 17.2 0.0 C B B B B B B B B B B B B B B B B B B	nitial O Delav(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 30.9 16.5 11.7 0.0 17.2 0.0 C B B B 699 30.9 14.3 15.8 C B B 699 15.8 C B B B 789 15.8 C B B 7 8 E B 7 8 (c), s 9,0 17.9 31.0 26.9 (c), s 9,0 17.9 31.0 25.0 (c), s 9,0 17.9 31.0 25.0 (c), s 9,0 17.9 31.0 35.1	6ile BackOfQ(50%),veh/ln	0.0	0.0	6.8	2.0	1.5	0.0				8.2	0.0	<u></u>
C B B B 699 307 699 14.3 15.8 C B B B B 699 15.8 C B B B B B 699 15.8 C B B B B B B B B B B B B B B B B B B B	nGrp Delay(d),s/veh	0.0	0.0	30.9	16.5	11.7	0.0				17.2	0.0	9.5
h 369 307 h 30.9 14.3 C B C B 1 2 3 4 5 6 7 8 1 2 3 4 5 6 8 1 2 3 4 5 6 8 10.5, s 90 17.9 31.0 26.9 3).s 40 40 4.0 4.0 4.0 10.1018), s 50 16.0 27.0 25.0 10.1018), s 61 13.0 17.0 5.1 10.1018	.nGrp LOS			С	В	В					В		Α
h 30.9 14.3 C B C B 1 2 3 4 5 6 7 8 1 2 3 4 6 8 (c), s 90 17.9 31.0 26.9), s 40 40 4.0 4.0 4.0 (max), s 50 16.0 27.0 25.0 (c+11), s 6.1 13.0 17.0 5.1 (c+11), s 0.0 0.9 3.1 3.0	hpproach Vol, veh/h		369			307						699	
C B 1 2 3 4 5 6 7 8 2 3 4 5 6 8 8 20 17.9 31.0 26.9 10 2 4.0 4.0 4.0 10 2 4.0 4.0 10 2 5.0 10 2 7.0 25.0 10 2 8.0 10 2 9.0 10 3.1 3.0 10 5.0 10 5.0 10 5.0 10 6.1 13.0 10 7.0 10 7.0 10 7.0 10 7.0 10 7.0 11 7.0	Approach Delay, s/veh		30.9			14.3						15.8	
1 2 3 4 5 6 7 3 4 6 6 7 (b), s 9,0 17.9 31.0 (max), s 4,0 4,0 4,0 (c+II), s 6,1 13,0 17.0 (c+I), s 6,1 13,0 17.0 (s 7), s 1,5 1,5 1,5 1,5 1,5 1,5 1,5 1,5 1,5 1,5	Approach LOS		С			В						В	
3 4 6 80, s 9,0 17.9 31.0 90, 17.9 31.0 17.9 31.0 17.9 4.0 18.0 4.0 18.0 27.0 19.1 1.0 19.1 1.0 1	imer	_	2	ω	4	51	6	7	œ				
(c), s 9,0 17.9 31.0 (d), s 40 40 4.0 (e), s 50 16.0 27.0 (e)+1), s 61 13.0 17.0 (e) c 17.0 0.9 3.1	Assigned Phs			ω	4		6						
), s 4.0 4.0 4.0 (max), s 5.0 16.0 27.0 (c+11), s 6.1 13.0 17.0 (c, c) 0.0 0.9 3.1	hs Duration (G+Y+Rc), s			9.0	17.9		31.0		26.9				
imax), s 5.0 16.0 27.0 (c+17), s 6.1 13.0 17.0 () s 0.0 0.9 3.1	Change Period (Y+Rc), s			4.0	4.0		4.0		4.0				
_c+1),.s	Max Green Setting (Gmax), s			5.0	16.0		27.0		25.0				
, s 0.0 0.9 3.1	Max Q Clear Time (g_c+I1), s			6.1	13.0		17.0		5.1				
	Green Ext Time (p_c), s			0.0	0.9		з. 1		3.0				
	ntersection Summary												
	HCM 2010 Ctrl Delay			195									

Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

> HCM 2010 TWSC 64: I-5 NB Ramps & 93rd Ave

Existing 2015
PM Peak Hour

RB EB EB EB WB WB WB WB WB WB WB WB WB W	Int Delay, s/veh 2	6											
245 505 0 0 250 340 45 0 115 0 117 0 245 505 0 0 250 340 45 0 115 0 117 0 0 0 0 0 0 250 340 45 0 115 0 117 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Movement	E	EBT	EBR		WBL	WBT	WBR	NBL	NBT	NBR	SBL	SB
245 505 0 0 250 340 45 0 115 0 Free Free Free Free Free Free Free Fr	Traffic Vol, veh/h	245	505	0		0	250	340	45	0	115	0	
nr 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Future Vol, veh/h	245	505	0		0	250	340	45	0	115	0	
Free	Conflicting Peds, #/hr	0	0	0		0	0	0	0	0	0	0	
None	Sign Control	Free	Free	Free		Free	Free	Free		Stop	Stop	Stop	St
125	RT Channelized			None				Yield			Yield		
ge.# 0	Storage Length	125	,					300					
Major	Veh in Median Storage, #		0				0			0			
94 94 94 94 94 94 94 94 94 94 94 94 94	Grade, %	,	0			,	0			0			
Major1 Major2 Minor1	Peak Hour Factor	94	94	94		94	94	94	94	94	94	94	
Major1 Major2 Minor1 266 0 - 0 266 362 48 0 122 266 0 - 0 1325 1325 537 266 0 - 0 1325 1325 537 4.13 - - 0 0.54 6.64 6.34 4.13 - - - 0.54 6.64 6.34 - - - - - 5.54 5.64 - 2.227 - - - - 5.54 5.64 - 1292 - 0 0 - - 162 147 521 17 1292 - 0 0 - 15.54 5.64 - 18 - 0 0 - 162 147 521 17 1292 - - 129 0 521 18 - - - 129 0 521 19 - - - 129 0 521 19 - - - 129 0 - 19 -	Heavy Vehides, %	ω	ω	ω		8	00	80	14	14	14	0	
Majort Majorz Minort 266 0 - 0 1325 1325 - - - 0 1325 1325 - - - 0 1059 1059 - - - - 266 266 - - - - - 6.54 6.64 - - - - - 5.54 5.64 5.64 - - - - - - 5.54 5.64 126 217 - - - - - - - 5.54 5.64 126 217 - - - - - - - 5.54 5.64 126 217 - - - - - - - 3.626 4.126 217 - - - - - - - - 162 147 - - - - - - - - 152 667 - - - - - - - - 129 0 - <td>Mvmt Flow</td> <td>261</td> <td>537</td> <td>0</td> <td></td> <td>0</td> <td>266</td> <td>362</td> <td>48</td> <td>0</td> <td>122</td> <td>0</td> <td></td>	Mvmt Flow	261	537	0		0	266	362	48	0	122	0	
266 0 0 1325 1325 1325 1325 267 267 267 267 267 267 267 267 267 267	Major/Minor	Major1			_	Najor2			Minor1				
THE BILL EBIT WBR VINT 1958 VIN	Conflicting Flow All	266	0					0	1325	1325	537		
Harmonia Program (A)	Stage 1								1059	1059			
4.13	Stage 2	,	,	í				·	266	266	·		
The state of the s	Critical Hdwy	4.13		·					6.54	6.64	6.34		
2.227	Critical Hdwy Stg 1								5.54	5.64			
1292 0 0 0 162 147 1292 0 0 0 162 147 1292 0 0 0 129 1292 0 0 0 129 1292 0 0 0 129 1292 0 0 0 129 1292 0 0 0 129 1293 0 0 0 129 1294 0 0 0 1295 0 0 0 1296 0 0 0 1297 0 0 0 1298 0 0 1298 0 0 0 1298 0 0 1298 0 0 1298 0 0 1298 0 0 1298 0 0 1298 0 0 1298 0 0 1298 0 0 1298 0 0 1298 0 0 1298 0 0 1298 0 0 1298 0 0 1298 0 1298 0 0 1298 0 0 1298 0 0 1298 0 1298 0 0 1298 0 0 1298 0 0 1298 0 1298 0 0 1298 0 0 1298 0 0 1298 0 1298 0 0 1298 0 0 1298 0 0 1298 0 1298 0 0 1298 0 0 1298 0 0 1298 0 1298 0 0 1298 0 0 1298 0 0 1298 0 1298 0 0 1298 0 0 1298 0 0 1298 0 1298 0 0 1298 0	Critical Howy Sig 2	ر د د د د									3		
1292 1 0 0 1 316 287	Pot Cap-1 Maneuver	1292		0		0 .					521		
175 175	Stage 1			0		0				287			
TIPS TO SET WEIT WER TO SET WEIT WERE TO SET OF SET OF SET WEIT WEIT WERE TO SET OF SET OF SET WEIT WEIT WERE TO SET OF SET OF SET WEIT WEIT WEIT WEIT WEIT WEIT WEIT WE	Stage 2			0		0			752	667			
1292	Platoon blocked, %												
EB WB NB 2.8 0 11.5 2.25 0 1.5 2.8 0 11.5 B A	Mov Cap-1 Maneuver	1292							129	0	521		
EB WB NB EB WB NB 11.5 2.8 0 11.5 B MI NBLn1 EBL EBT WBT WBR 0.235 0.202 0.235 0.202 0.235 0.202 0.235 0.202 0.235 0.202 0.235 0.202 0.235 0.202 0.235 0.202 0.235 0.202	Mov Cap-2 Maneuver								129	0			
EB WB NB NB NB NB NB NB N	Stage 1								752	> <			
EB WB 2.8 0 MI NBL/1 EBL EBT WBT WBR 725 1292 0.235 0.202 11.5 8.5 B A	z añerc		١.						707	c			
mt NBLn1 EBL EBT WBT WBR 725 1292 0.235 0.202 11.5 8.5 B A	Approach	EB				WB			NB				
mt NBL/1 EBL EBT WBT WBR 725 1292 0.235 0202 11.5 8.5 B A	HCM Control Delay, s	2.8				0			11.5				
mt NBLn1 EBL EBT WBT WB 725 1292 0.235 0.202 11.5 8.5 B A	HCMLOS								В				
725 1292	Minor Lane/Major Mvmt	NBLn1	EBL		WBT	WBR							
0.235 0.202	Capacity (veh/h)	725	1292	·	,								
B A	HCM Lane V/C Ratio	0.235	0.202										
В А	HCM Control Delay (s)	11.5	8.5		,								
	HCM Lane LOS	В	· >										

Tumwater Transportation Master Plan SCJ Alliance

HCM 2010 TWSC 65: Kimmie St & 93rd Ave

Existing 2015
PM Peak Hour

Int Delay, s/veh 1.6	6					П				П				
Moremont	EB!	EBI	EBB		ND .	WDT	WBD			NDT	NDD	SBI	0	9
Traffic Vol. veh/h	25	460	15		27 6	410	27 5		15	_	10	2 0		C
Future Vol, veh/h	25	460	5 5		5 С	410	57 (3		10 0	5 С		о о
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	S	Stop
RT Channelized			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
Heavy Vehicles, %	4	4	4		_	_	_		0	0	0	5		5
Mvmt Flow	27	489	16		5	436	57		16	_	=======================================	5		S
Major/Minor	Major1			>	Najor2			S	inor1			Minor2		
Conflicting Flow All	441	0	0		505	0	0		1030	1003	497	1005	3	1008
Stage 1		,			,	,			551	551		449	4	449
Stage 2	,					,	í		479	452	·	556	559	59
Critical Hdwy	4.14				4.11	,			7.1	6.5	6.2	7.15	6.55	55
Critical Hdwy Stg 1									6.1	5.5		6.15	5.55	55
Critical Hdwy Stg 2									6.1	5.5			5.55	55
Follow-up Hdwy	2.236				2.209				ω .5	4	ω ω		4.045	5
Pot Cap-1 Maneuver	1108				1065				214	244	577	217	238	38
Stage 1									522	519		584	567	57
Stage 2									571	574		510	506	90
Platoon blocked, %														
Mov Cap-1 Maneuver	1108				1065				186	234	577	206	229	9
Mov Cap-2 Maneuver									186	234		206	229	9
Stage 1									504	501		564	564	54
Stage 2									513	5/1		483	489	9
Approach	EB				WB				NB			SB		
HCM Control Delay, s	0.4				0.1				20.9			13.9		
HCM LOS									C			В		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR SBLn1	ELM	П					
Capacity (veh/h)	254	1108			1065			469						
HCM Lane V/C Ratio	0.109	0.024	,		0.005		-	.136						
HCM Control Delay (s)	20.9	8.3	0	,	8.4	0	·	13.9						
HCM Lane LOS	C	⊳	⊳		Þ	⊳	,	В						
HCM 95th %tile Q(veh)	0.4	0.1	,		0		·	0.5						
TICINI ZOUIC CE(VCIT)	0.4	9			c			0.0						

Synchro 9 Report 6/10/2016

Tumwater Transportation Master Plan SCJ Alliance

HCM 2010 AWSC 66: Case Rd & 93rd Ave

Existing 2015
PM Peak Hour

Intersection	2									
Intersection Delay, s/veh Intersection LOS	20.3 C									
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NEU	NEL
Traffic Vol, veh/h	0	2	315	165	0	55	295	30	0	80
Future Vol, veh/h	0	2	315	165	0	55	295	30	0	80
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	ω	ω	ω	2	2	2	2	2	0
Mvmt Flow	0	2	342	179	0	60	321	33	0	87
Number of Lanes	0	0	_	0	0	0	_	_	0	0
Approach		EB				WB				Æ
Opposing Approach		WB				ΕB				WS
Opposing Lanes		2				_				_
Conflicting Approach Left		WS				NE.				ΕB
Conflicting Lanes Left		_				_				_
Conflicting Approach Right		NE				SW				WB
Conflicting Lanes Right		_				_				2
HCM Control Delay		25.4				18.8				12.2
HCMLOS		D				C				σ
Lane		NELn1	EBLn1	WBLn1	WBLn2	SWLn1				
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	_				
Lane Flow Rate		141	524	380	33	110				
Geometry Grp		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				
HCMI and I OS		σ	D	C	Þ	В				
LICINI FUIR FOO										

Tumwater Transportation Master Plan SCJ Alliance

HCM 2010 AWSC 66: Case Rd & 93rd Ave

Existing 2015
PM Peak Hour

The second secon							
Intersection Delay, s/veh							
Intersection LOS							
Movement	UWS	SWL	TWS	SWR			
Traffic Vol, veh/h		50	50	1			
Future Vol, veh/h		50	50	_			
Peak Hour Factor	0.92	0.92 0.92 0.92	0.92	0.92			
Heavy Vehicles, %		_	_	_			
Mvmt Flow	0	54	54	_			
Number of Lanes	0	0	_	0			
Approach		SW					
Opposing Approach		NE					
Opposing Lanes		_					
Conflicting Approach Left		WB					
Conflicting Lanes Left		2					
Conflicting Approach Right		EB					
Conflicting Lanes Right		_					
HCM Control Delay		11.9					
HCM LOS		В					

Synchro 9 Report 6/10/2016

Tumwater Transportation Master Plan SCJ Alliance

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

Existing 2015
PM Peak Hour

llersection								
Illersection Delay, siven	4.0							
Illersection FOS	D							
Movement	EBU	EBT	EBR	WBU	WBL	WBT	NBU	NBL
Traffic Vol, veh/h	0	240	155	0	85	235	0	130
uture Vol, veh/h	0	240	155	0	85	235	0	130
Peak Hour Factor	0.92	0.87	0.87	0.92	0.87	0.87	0.92	0.87
leavy Vehicles, %	2	ω	ω	2	2	2	2	_
Mvmt Flow	0	276	178	0	98	270	0	149
Number of Lanes	0		0	0	0	_	0	_
Approach		EB			WB			NB
Opposing Approach		WB			EB			
Opposing Lanes		_			_			0
Conflicting Approach Left					NB			EB
Conflicting Lanes Left					_			<u>_</u>
Conflicting Approach Right		NB.						WB
Conflicting Lanes Right		à			0			
TCM Control Delay		15.8			14.4			12.2
_ane	NBLn1	EBLn1	WBLn1					
/ol Left, %	67%	0%	27%					
/ol Thru, %	0%	61%	73%					
Vol Right, %	33%	39%	0%					
Sign Control	Stop	Stop	Stop					
T Vol	130	0	8					
Through Vol	0	240	235					
RT Vol	65	155	0					
ane Flow Rate	224	454	368					
Geometry Grp	_	_	_					
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					
	200		0.541					
ICM Lane V/C Ratio	0.365	0.621	,					
HCM Lane V/C Ratio	0.365	0.621 15.8	14.4					
HCM Lane V/C Ratio HCM Control Delay HCM Lane LOS	0.365 12.2 B	0.621 15.8 C	14.4 B					

Tumwater Transportation Master Plan SCJ Alliance

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

Existing 2015
PM Peak Hour

0 95 10 15 0 0 95 10 15 0
WBI WBK SBLn1 SBLn
WBI WDK SBLIT SB
Minor 2 Minor 2 Minor 2 Minor 2 Minor 2 Minor 3 Minor 3 Minor 3 Minor 4 Minor 4 Minor 5 Minor 5 Minor 5 Minor 5 Minor 6 Minor 6 Minor 7 Minor 8 Minor 8 Minor 9 Min
Minor 2 Minor 2 Minor 2 Minor 2 Minor 2 Minor 3 Minor 3 Minor 3 Minor 4 Minor 4 Minor 5 Minor 5 Minor 5 Minor 5 Minor 6 Minor 6 Minor 7 Minor 8 Minor 8 Minor 9 Min
Minor 2 Minor 2 Minor 2 Minor 2 Minor 2 Minor 3 Minor 3 Minor 3 Minor 4 Minor 4 Minor 5 Minor 5 Minor 5 Minor 5 Minor 6 Minor 6 Minor 7 Minor 8 Minor 8 Minor 9 Min
Minor2 Minor2 Minor2 Minor2 Minor2 Minor3 Minor4 Minor5 Minor5 Minor6 Minor6 Minor6 Minor7 Minor7 Minor7 Minor7 Minor8 Minor8 Minor8 Minor9 Minor9
3. 6
3.309 939 939 939

Synchro 9 Report 6/10/2016

Tumwater Transportation Master Plan SCJ Alliance

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

Existing 2015
PM Peak Hour

Intersection Int Delay, s/veh Movement Traffic Vol, veh/h Future Vol, veh/h Conflicting Peds, #/hr Sign Control RT Channelized Storage Length Veh in Median Storage, # Deak Hour Factor Peak Hour Factor Heavy Vehides, %	EBT E 630 630 0 0 Free F - Nc - Nc 0 0 0 0 0 1	WBL. 70 70 70 70 8 Free 92 2	WBT 215 215 215 0 0 0 0 0 0 92 2 2 0 0	ω σ	NEL 15 15 15 15 15 15 15 15 15 15 15 15 15
%		92 92 1 2 33 76	92 234		92 1 16
Major/Minor Conflicting Flow All	Major1	Major2 0 685	. 0	<u>≤</u>	Minor1 1071
		. 412		~ · · · ·	386
Critical Hdwy Stg 1				ט ט	5.41
ollow-up Hdwy		2		3.5	3.509
ot Cap-1 Maneuver					246
Stage 2					689
Platoon blocked, %		908			227
Mov Cap-2 Maneuver					419
Stage 2		·			631
Approach	EB	WB			NE
HCM Control Delay, s HCM LOS	0	2.3			17.4 C
Minor Lane/Major Mymt	NELn1 NELn2 EBT	3T EBR WBL	WBT -		
HCM Lane V/C Ratio	0.374				
HCM Lane LOS		9.3			

Tumwater Transportation Master Plan SCJ Alliance

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	NB
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	_
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
Heavy Vehicles, %	2	6	6	6	2	9	9	9	2	4	4	
Mvmt Flow	0	58	105	1	0	174	58	132	0	5	253	147
Number of Lanes	0	_	_	0	0	_	_	0	0	_	_	
Approach		EB				WB				NB		
Opposing Approach		WB				EB				SB		
Opposing Lanes		2				2				2		
Conflicting Approach Left		SB				NB				ΕB		
Conflicting Lanes Left		2				2				2		
Conflicting Approach Right		NB				SB				WB		
Conflicting Lanes Right		2				2				2		
HCM Control Delay		12.4				14				25.1		
HCM LOS		В				Φ.				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%	9%	0%	69%	0%	14%			
Sign Control		Stop										
Traffic Vol by Lane		5	380	55	110	165	180	50	180			
LT Vol		51	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										
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		,	J	В	œ	D	D	В	В			
		ω	C			Ţ	c					

Synchro 9 Report 6/10/2016

Tumwater Transportation Master Plan SCJ Alliance

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	ω	ω	ω	
Mvmt Flow	0	53	163	26	
Number of Lanes	0	_	_	0	
Approach					
Opposing Approach		SB			
Opposing Lanes		NB SB			
Conflicting Approach Left		SB NB			
		SB NB			
Conflicting Lanes Left		SB NB 2 WB			
Conflicting Lanes Left Conflicting Approach Right		SB NB			
Conflicting Lanes Left Conflicting Approach Right Conflicting Lanes Right		SB NB 2 WB 2 EB			
Conflicting Lanes Left Conflicting Approach Right Conflicting Lanes Right HCM Control Delay		SB NB NB 2 WB 2 EB 2 13.4			
Conflicting Lanes Left Conflicting Approach Right Conflicting Lanes Right HCM Control Delay HCM LOS		SB NB 2 WB 2 EB 13.4 B			
Conflicting Lanes Left Conflicting Approach Right Conflicting Lanes Right HCM Control Delay HCM LOS		SB NB 2 WB 2 EB EB B			

Tumwater Transportation Master Plan SCJ Alliance

Lanes, Volumes, Timings
2: Crosby Blvd & Mottman Rd

Projected 2040 No Build

Taper Length (ft)
Right Turn on Red
Link Speed (mph)
Link Distance (ft)
Travel Time (s)
Peak Hour Factor
Heavy Vehicles (%)
Shared Lane Traffic (%) Lane Group

Lane Configurations

Traffic Volume (vph)

Future Volume (vph)
Ideal Flow (vphpi)

Storage Length (ff) Minimum Initial (s)
Minimum Split (s)
Total Split (s)
Total Split (s)
Total Split (s)
Yellow Time (s)
All-Red Time (s)
All-Red Time (s)
Lost Time Adjust (s)
Total Lost Time (s)
Lead/Lag
Lead-Lag Optimize? Area Type: Cycle Length: 100 Turn Type Protected Phases Recall Mode Switch Phase Detector Phase Permitted Phases Storage Lanes Other 4.0 20.5 39.0 39.0% 3.5 1.0 0.0 4.5 None Perm 0.95 205 205 205 1900 200 25 4.0 20.5 39.0 39.0% 3.5 1.0 0.0 4.5 None 230 230 1900 0.95 ļ EBI R 30 940 21.4 0.95 35 1900 0 4 Yes 4.0 20.5 39.0 39.0% 3.5 1.0 None Perm 0.95 5 1900 0 0 25 4.0 20.5 39.0 39.0% 3.5 1.0 0.0 4.5 None 30 1116 25.4 0.95 1900 30 † ₈NA 0.95 125 125 1900 0 Yes C-Max C-Max C-Max C-Max 4.0 20.5 61.0 61.0% 3.5 1.0 0.0 4.5 Perm 0.95 45 45 1900 200 25 4.0 20.5 61.0 61.0% 3.5 1.0 0.0 30 645 14.7 0.95 665 665 1900 R 4.0 20.5 61.0 61.0% 3.5 1.0 0.0 Perm 0.95 120 120 1900 1900 Yes 4.0 20.5 61.0% 61.0% 3.5 1.0 0.0 Perm 0.95 190 190 1900 100 100 25 4.0 20.5 61.0 61.0% 3.5 1.0 0.0 30 417 9.5 0.95 3% 1900 Z. 850 6 535 535 1900 0 0.95 Yes

Splits and Phases: 2: Crosby Blvd & Mottman Rd

Control Type: Actuated-Coordinated

Actuated Cycle Length: 100
Offset: 82 (82%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow Natural Cycle: 60



Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

HCM 2010 Signalized Intersection Summary
2: Crosby Blvd & Mottman Rd

Projected 2040 No Build

			1	1		1	1	1	1	1	l	
	-	↓	4	~	†	>	٠	→	*	•	←	4
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	_71	₽)			₽		_#	→	-4	-31	≱	
Traffic Volume (veh/h)	205	230	35	5	30	125	45	665	120	190	850	535
Future Volume (veh/h)	205	230	35	σī	30	125	45	665	120	190	850	535
Number	7	4	14	ω	8	18	5	2	12	_	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1900	1900	1900	1900	1881	1881	1881	1845	1845	1900
Adj Flow Rate, veh/h	216	242	37	5	32	132	47	700	126	200	895	0
Adj No. of Lanes	_	_	0	0	_	0	_	_	_	_	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, %	ω	ω	ω	0	0	0	_	_	_	ω	ω	ω
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
Grp Volume(v), veh/h	216	0	279	169	0	0	47	700	126	200	895	0
Grp Sat Flow(s),veh/h/ln	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		0.0	0.0	15.3	20.1	2.9	43.8	11.6	0.0
Prop In Lane	7.00	>	0.13	0.03	>	0.78	1.00	2	1.00	1.00	2	0.00
Lane Grp Cap(c), veh/h	33/	c	448	450	c	c	413	1245	8401	3/4	2319	
V/C Ratio(X)	0.64	0.00	0.62	608	0.00	0.00	0.11	1245	0.12	0.54	0.39	0.00
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	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 BackOfQ(50%),veh/ln	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			В	В	Α	C	A	
Approach Vol, veh/h		495			169			873			1095	
Approach Delay, s/veh		36.5			31.9			10.2			11.5	
Approach LOS		D			С			В			В	
Timer	_	2	ယ	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		70.7		29.3		70.7		29.3				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		56.5		34.5		56.5		34.5				
Max Q Clear Time (g_c+l1), s		22.1		21.9		45.8		10.5				
Green Ext Time (p_c), s		19.7		3.0		8.4		3.7				
Intersection Summary												
HCM 2010 Ctrl Delay			17.1									
HCM 2010 LOS			В									

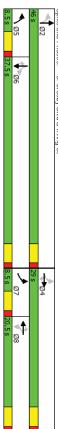
Tumwater Transportation Master Plan SCJ Alliance

Lanes, Volumes, Timings 3: Crosby Blvd & Irving St

Projected 2040 No Build
PM Peak Hour

Lane Group Lane Configurations Traffic Volume (vph) Future Volume (vph) Ideal Flow (vphpi) Storage Length (ft) Storage Lanes Taper Length (ft)	75 75 1900 0 0	EBT ↓	EBR 45 1900 2000 1	WBL 40 1900 0 0 0 25	WBT 45	WBR 220 220 1900 150 1	NBL 35 35 35 2700 2000 2000 25	NBT → 505 505	NBR 25 1900 0	SBL SBL 150 1900 1900 125		SBT 660 660 1900
Taper Length (ft) Right Turn on Red	25		Yes	25		Yes	25		Yes	N)	G	.ci
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
Heavy Vehicles (%)	8%	8%	8%	1%	1%	1%	1%	1%	1%	2%		2%
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA		Perm		NA
Protected Phases	7	4			00		5	2				6
Permitted Phases	4		4	00		00	2			6		
Detector Phase	7	4	4	00	00	00	ر ت	2		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
Minimum Split (s)	8.5	20.5	20.5	20.5	20.5	20.5	8.5	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
Total Split (%)	11.3%	38.7%	38.7%	27.3%	27.3%	27.3%	11.3%	61.3%		50.0%		50.0%
Yellow Time (s)	ω 5	3.5	3.5	ω .5	3.5	3.5	3.5	3.5		3.5		ω .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
Total Lost Time (s)		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
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes			Yes		Yes
Recall Mode	None	None	None	None	None	None	None	Max		Max		Max
Intersection Summary												
Area Type:	Other											
Cycle Length: 75												
Actuated Cycle Length: 63.8	3.8											
Control Type: 75	ncoordinated											

Splits and Phases: 3: Crosby Blvd & Irving St



Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

HCM 2010 Signalized Intersection Summary 3: Crosby Blvd & Irving St

Projected 2040 No Build PM Peak Hour

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBI
Lane Configurations		⊅ ,	٦,		2 →	-34	J,	Ŧ,		H	→	
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	ω	00	18	ر ت	2	12	_	6	16
Initial Q (Qb), veh	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		1.0
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1759	1759	1900	1881	1881	1881	1881	1900	1863	1863	1863
Adj Flow Rate, veh/h	79	53	47	42	47	232	37	532	26	158	695	
Adj No. of Lanes	0	i _		0		i _	i _	<u>.</u>	0	-	i _	
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	00	00	_	_	_	_	_	_	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	1500	1703	10.07	0.0/	0.50	0.50	1500
Sat Flow, ven/n	123	0/0/	1495	705	00/50	222	27	0 1/19	550	150	605	1583
Grn Sat Flow(s), veh/h/ln	216	0	1495	1108	0 0	1500	1792	o c	1866	848	1863	1582
Q Serve(a_s), s	6.0	0.0	1.6	0.6	0.0	8.6	0.5	0.0		6.8	16.1	0.0
Cycle Q Clear(g_c), s	6.0	0.0	1.6	6.6	0.0	8.6	0.5	0.0		9.2	16.1	0.0
Prop In Lane	0.60		1.00	0.47		1.00	1.00		0.05	1.00		1.00
Lane Grp Cap(c), veh/h	0	0	282	294	0	301	400	0	1244	561	1051	893
V/C 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
HCM Platoon Ratio	100	100	100	100	100	1 91	100	100	1 00	100	100	100
Upstream Filter(I)	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
Incr Delay (d2), s/veh	0.0	0.0	0.3	0.6	0.0	6.0	0.1	0.0	1.2	1.3	ω ω	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
%IIe BackUTU(50%),ven/In	0.0	0.0	21	22.6	0.0	200	7.2	0.0	4.9	o	137	0.0
InGra I OS	0.0	ć	o :	0 10	0.0	0 ;	Δ .	0.0	Δ:	Δ		9
Approach Vol. veh/h		179			321			595			853	
Approach Delay, s/veh		5.6			27.9			6.2			12.2	
Approach LOS		Α			С			Α			В	
Timer		2	ω	4	5	6	7	8				
Assigned Phs		2		4	5	6		8				
Phs 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 (g_c+l1), 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				
Intersection Summary												
HCM 2010 Ctrl Delay			12.3									
HCM 2010 LOS			σ.									

Tumwater Transportation Master Plan SCJ Alliance

HCM 2010 AWSC 4: Irving St & 7th Ave

Projected 2040 No Build PM Peak Hour

HCM 95th-tile Q	HCM Lane LOS	HCM Control Delay	HCM Lane V/C Ratio	Service Time	Cap	Convergence, Y/N	Departure Headway (Hd)	Degree of Util (X)	Geometry Grp	Lane Flow Rate	RT Vol	Through Vol	LT Vol	Traffic Vol by Lane	Sign Control	Vol Right, %	Vol Thru, %	Vol Left, %	Lane	HCM LOS	HCM Control Delay	Conflicting Lanes Right	Conflicting Approach Right	Conflicting Lanes Left	Conflicting Approach Left	Opposing Lanes	Opposing Approach	Approach	Lanes		01	Peak Hour Factor 0.95		Traffic Vol, veh/h	Movement EBU	Intersection LOS	Intersection Delay, s/veh 9.5	Intersection
1.6		10.3	0.349	2.788	756	Yes	4.752	0.349		264	_	5	24	251	Sto	09	2%	98%	NBLn1			_	z		SB		WB	EB				5 0.95			U EB	Α	5	
6 1.3	B /		9 0.305	8 2.109		s Yes	_					5 15		Ν.		% 92%		% 2%	EB	A	9		æ		В	_	8	В				5 0.95			L EB1			
0.1	A			2.895		s Yes	4					5 25					9		l WBLn1													5 0.95			Γ EBR			
0	Þ			2.608		Yes						5			Ŋ		СЛ		SBLn1													0.95			WBU			
																				Þ	8.1	_	SB	_	NB	_	EB	WB	0	_	0	0.95	_	1	WBL			
																													_	26	0	0.95	25	25	WBT			
																													0	_	0	0.95	_	1	WBR			
																													0	0	2	0.95	0	0	NBU			
																				В	10.3	_	WB	_	EB	_	SB	NB	0	258	_	0.95	245	245	NBL			
																													_	5	_	0.95	5	5	NBT			
																													0	_	_	0.95	_	_	NBR			

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Tumwater Transportation Master Plan SCJ Alliance

HCM 2010 AWSC 4: Irving St & 7th Ave

Projected 2040 No Build PM Peak Hour

Intersection					
Intersection Delay, s/veh					
Intersection LOS					
Vovement	SBU	SBL	SBT	SBR	
Traffic Vol, veh/h	0	0	5	5	
Future Vol, veh/h	0	0	5	5	
Peak Hour Factor	0.95	0.95	0.95	0.95	
Heavy Vehicles, %	2	0	0	0	
Vivmt Flow	0	0	5	5	
Number of Lanes	0	0	_	0	
Annroach					
)			SB		
Opposing Approach			SB		
Opposing Lanes			SB SB		
Conflicting Approach Left			NB SB		
Conflicting Lanes Left			WB 1 SB		
Conflicting Approach Right			NB NB		
On a fill a line I among Diode			SB NB NB EB		
Conflicting Lanes Right			SB NB NB EB		
HCM Control Delay			SB NB		
HCM Control Delay HCM LOS			SB NB NB NB 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		
HCM Control Delay HCM LOS			SB NB		
HCM Control Delay HCM LOS			SB NB		

Tumwater Transportation Master Plan SCJ Alliance

HCM 2010 TWSC 5: Crosby Blvd & Barnes Rd

Projected 2040 No Build PM Peak Hour

Int Delay, s/veh 6	.6													
Movement	EBL	EBT	EBR		WBL	WBT	WBR		NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	10				10	5	285		_	210	5	345	275	20
Future Vol, veh/h	10	_	_		10	5	285		_	210	5	345	275	20
Conflicting Peds, #/hr	0		0		0	0	0		0	0	0	0	0	0
Sign Control	Stop	Stop	Stop		Stop	Stop	Stop		Free	Free	Free			Free
RT Channelized	,		None		į		None		í		None			None
Storage Length							0					175		,
Veh in Median Storage, #		0				0				0				,
Grade, %		0	,		,	0				0				,
Peak Hour Factor	95	95	95		95	95	95		95	95	95	95		95
Heavy Vehicles, %	10	10	10		2	2	2		4	4	4	2		2
Mvmt Flow	=	_	_		=	5	300		_	221	5	363	289	21
Major/Minor	Minor2			_	/linor1			_	1ajor1			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		ļ,
Critical Hdwy Stg 1	6.2	5.6			6.12	5.52			,				,	
Critical Hdwy Stg 2	6.2	5.6												,
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		815		1238			1342		
Stage 1	274	302			777	717								
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	,						,	١.
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				В									
Minor Lane/Major Mvmt	NBL	NBT	NBR E	NBR EBLn1WBLn1WBLn2	/BLn1W	/BLn2	SBL	SBT	SBR					
Capacity (veh/h)	1238	ï	ï	78	119	815	1342	í	ï					
HCM Lane V/C Ratio	0.001			0.162	0.133		0.271							
HCM Control Delay (s)	7.9	0		59.9	39.8	12	8.7							
HCM Lane LOS	A	Þ		'n	т	В	⊳							
HCM 95th %tile Q(veh)	0		,	0.5	0.4	1.7	1	,	í					

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Tumwater Transportation Master Plan SCJ Alliance

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

Projected 2040 No Build PM Peak Hour

Int Delay, siveh 11118 Movement Movemen									otes
1111.8									
111.8					0.8		29 -		CM 95th %tile Q(veh)
111.8 EBT EBR WBI WBT NBL NB						l.			CM Lane LUS
111.8 EBT EBR WBL WBT NBL NBL NBL 1190 85 250 410 210 22 22 170 0 0 0 0 0 0 0 0 0								\$ 34	CM Control Delay (S)
111.8 EBT EBR WBI WBT NBL NBL NBL 190 85 250 410 210 22 190 85 250 410 210 22 190 85 250 410 210 22 190 85 250 410 210 22 190 190 85 250 410 210 22 190						١.		-	CIVI L'AITE V/C KALIO
1111.8								4 ~	apacity (vervit)
1111.8 EBT EBR WB WBT NBL NBL NB				:	- 1	ŗ	[anothe (wob/h)
111.8 EBT EBR WBI WBT NBL NB				WBT		FBR	_	NBI	inor Lane/Major Mymt
111.8 EBR WBI WBI NBL NB									
111.8 EBT EBR WBI WBT NBL NBL		F							CMLOS
111.8 EBR WB WBT NBL NBL 1990		\$ 344.5		3.2			0		CM Control Delay, s
1111.8		NB		WB			EB		pproach
1111.8 EBT EBR WBI WBT NBL NBL									
1111.8 EBT EBR WBL WBT NBL NBL									1
1111.8 EBT EBR WBI WBT NBL NBL		297							Stage 2
1111.8 EBT EBR WBI WBT NBL NBL		798		,					Stage 1
1111.8 EBT EBR WBL WBT NBL NBL		~ 163		,					lov Cap-2 Maneuver
1111.8 EBT EBR WBI WBT NBL NBL	796	~ 163		1284					ov Cap-1 Maneuver
1111.8 EBT EBR WBI WBT NBL NBL									latoon blocked, %
1111.8 EBI EBR WBL WBT NBL NBL		374							Stage 2
1111.8 EBT EBR WBI WBT NBL NBL		798							Stage 1
111.8 EBR WBI WBI NBL NB	796	~ 205		1284					ot Cap-1 Maneuver
111.8 EBT EBR WBI WBT NBL NBL	3.309	3.509		2.2					ollow-up Hdwy
111.8 EBT EBR WBL WBT NBL NBL		5.41							ritical Hdwy Stg 2
1111.8 EBT EBR WBL WBT NBL NBL 190 85 250 410 210 22 190 85 250 410 210 22 190 85 250 410 210 22 190 85 250 410 210 22 190 85 250 410 210 22 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 19		5.41							ritical Hdwy Stg 1
1111.8 EBT EBR WBI WBT NBL NBL	6.21	6.41		4.1					ritical Hdwy
111.8 EBT EBR WBL WBT NBL NBL		958							Stage 2
111.8 EBT EBR WBL WBT NBL NBL		245							Stage 1
1111.8 EBT EBR WBL WBT NBL 190 85 250 410 210 190 85 250 410 210 190 85 250 410 210 190 85 250 410 210 190 85 250 410 210 190 86 250 410 210 190 86 250 410 210 190 89 263 432 221 191 191 191 191 191 191 191 191 191 191 191 191 191 191 191 191 191 191 191 191 191 191 191 191 191 191 191	245	1203	С	289			О		onflicting Flow All
111.8 EBT EBR WBL WBT NBL		Minor1		Vlajor2			Major1		ajor/Minor
111.8 EBT EBR WBL WBT NBL									
111.8 EBT EBR WBL WBT NBL	242	12.2	432	263		95	200		vmt How
111.8 EBT EBR WBL WBT NBL			0	0			ω		eavy Vehicles, %
111.8 EBT EBR WBL WBT NBL	 95	95	95	95	0.	99	95		eak Hour Factor
111.8 EBT EBR WBL WBT NBL		0	0				0		rade, %
111.8 EBT EBR WBL WBT NBL Th 190 85 250 410 210 Ah 190 85 250 410 210 S,#/hr 0 0 0 0 S,#/hr 190 85 Free Free Free Stop - None - 250 - 0		0	0				0		eh in Median Storage, #
111.8 EBT EBR WBL WBT NBL 190 85 250 410 210 190 85 250 410 210 190 85 250 410 210 190 85 250 410 210 190 85 250 410 210 190 85 250 410 210 190 95 250 410 210 190 95 250 410 210 190 95 250 410 210 190 95 250 410 210 190 95 250 410 210 190 95 250 410 210 190 95 250 410 210 190 95 250 410 190 95 250 410 200 95 250 410		0		250					torage Length
111.8 EBT EBR WBL WBT NBL h 190 85 250 410 210 h 190 85 250 400 210 h 190 8 200 0 0 0 s,#hr 0 0 0 0 0 0 Stop	None		None			None			T Channelized
111.8 EBT EBR WBL WBT NBL II Th 190 85 250 410 210 Th 190 85 250 440 210 Th 190 85 250 400 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Stop	Stop	Free	Free		Free	Free		ign Control
111.8 EBT EBR WBL WBT NBL I 'h 190 85 250 410 210 h 190 85 250 410 210	0	0	0	0	_	0	0		onflicting Peds, #/hr
111.8 EBT EBR WBL WBT NBL I 190 85 250 410 210	230	210	410	250		జ	190		uture Vol, veh/h
111.8 EBT EBR WBL WBT NBL	230	210	410	250		œ	190		affic Vol, veh/h
	NBR	NBL	WBT	WBL	,	EBR	EBT		lovement
								ā	
								×	

Tumwater Transportation Master Plan SCJ Alliance

HCM 2010 TWSC 7: RW Johnson Rd & Sapp Rd

Projected 2040 No Build PM Peak Hour

HCM 95th %tile Q(veh)	HCM Lang LOS	HCM Control Delay (s)	HCM Lane V/C Ratio	Capacity (veh/h)	Minor Lane/Major Mvmt	HCM LOS	HCM Control Delay, s	Approach	orgo r	Stage 2	Stage 1	Mov Cap-2 Maneuver	Mov Can-1 Managurar	Diatron blocked %	Stage 1	For Cap-1 Maneuver	Follow-up Hdwy	Critical Hdwy Stg 2	Critical Hdwy Stg 1	Critical Hdwy	Stage 2	Stage 1	Conflicting Flow All	Major/Minor	Mvmt Flow	Heavy Vehicles, %	Peak Hour Factor	Grade, %	Veh in Median Storage, #	Storage Length	RT Channelized	Sign Control	Conflicting Peds, #/hr	Future Vol, veh/h	Traffic Vol, veh/h	Movement	Int Delay, s/veh	Intersection	
0.3	ū	10.8	0.078	675	NBLn1		2	EB					1270			13/9	2.227			4.13			189	Major1	21	ω	95					Free	0	20	20	EBL	7.7		
0 1	>	7.7	0.015	1379	EBL															,	,		0		53	ω	95	0	0			Free	0	50	50	EBT			
, 3	>	0			EBT															,	,		0		ហ	ω	95				None	Free	0	57	5	EBR			
		,			EBR																			_															
0.1	>	7.4	0.02	1553	WBL		<u>-</u> 1	WB					1552			1003	2.209			4.11		,	58	Major2	32	_	95					Free	0	30	30	WBL			
, 1	>	0			WBT															,	,		0		74	_	95	0	0			Free	0	70	70	WBT			
					WBR SBLn															,	,	,	0		116	_	95				None	Free	0	110	110	WBR			
1.9	ס	14.5	0.4	631	SBLn1																			-															
						В	10.8	NB	9	664	899	726	F26	/00	744	014	3.5	6.1	6.1	7.1	242	97	339	/linor1	S	0	95					Stop	0	57	5	NBL			
									000	685	806	777	л л	2	701	010	4	5.5	5.5	6.5	253	97	350		26	0	95	0	0			Stop	0	25	25	NBT			
													1018		١.	010				6.2			55		21	0	95				None	Stop	0	20	20	NBR			
																								_															
						В	14.5	SB	9	831	791	582	д 2 2	00	004	000	3.52/	6.13	6.13	7.13	121	195	316	Minor2	158	ω	95					Stop	0	150	150	SBL			
										797	720	501	501	010	010	010			5.53	6.53	100	195	295		42	ω	95	0	0			Ś			40	SBT			
													015			915	3.32/			6.23		,	132		53	ω	95		,		None	Stop	0	50	50	SBR			

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Tumwater Transportation Master Plan SCJ Alliance

HCM 2010 TWSC 8: Sapp Rd & Crosby Blvd

Projected 2040 No Build PM Peak Hour

nt Delay, s/veh 5	.6					
document	M/DI	MIDD	TOIN		CBI	CDT
raffic Vol. veh/h	225	20	230	200	15	205
uture Vol, veh/h	225	20	230		5 5	205
Conflicting Peds, #/hr	0	0	0		0	0
Sign Control	Stop	Stop	Free	_	Free	Free
T Channelized		None				None
Storage Length	250	0			0	
/eh in Median Storage, #	0					0
Grade, %	0					0
Peak Hour Factor	95	95	95	5 95	95	95
Heavy Vehicles, %	_	_	_		0	0
Wymt Flow	237	21	242		16	216
ajor/Minor	Minor1		Major1	_	Major2	
Conflicting Flow All	594	347		0 0	453	0
Stage 1	347					
Stage 2	247					í
ritical Hdwy	6.41	6.21			4.1	·
Critical Hdwy Stg 1	5.41					
ritical Hdwy Stg 2	5.41					
ollow-up Hdwy	3.509	3.309			2.2	
ot Cap-1 Maneuver	469	698			1118	,
Stage 1	718					
Stage 2	796					
Platoon blocked, %						
ov Cap-1 Maneuver	462	698			1118	
Mov Cap-2 Maneuver	462					
Stage 1	718					
Stage 2	785					
Approach	WB		NB	ω	SB	
HCM Control Delay, s	19.9		0	0	0.6	
HCMLOS	C					
nor Lane/Major Mvmt	NBT	NBRWBLn1WBLn2	2 SBL SBT	П		
Capacity (veh/h)			1118			
			0.014			
CM Lane V/C Ratio		200	8.3			
CM Lane V/C Ratio CM Control Delay (s)						
HCM Lane V/C Ratio HCM Control Delay (s) HCM Lane LOS		- 20.7 IU.3	Þ	•		

Tumwater Transportation Master Plan SCJ Alliance

SimTraffic Performance Report

Projected 2040 Baseline PM Peak Hour

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

Total Del/Veh (s) 8.2 9.5 5.0	Denied Del/Veh (s) 0.1 0.2 0.2	Movement EBL EBT EBR
0 10.7	2 0.3	₹ WBL
12.0	0.2	WBT
7.2	0.2	WBR
10.8	0.2	NBL
11.7	0.2	NBT
7.4	0.2	NBR
1.8	0.3	SBL
2.2	0.3	SBT
1.2	0.3	SBR

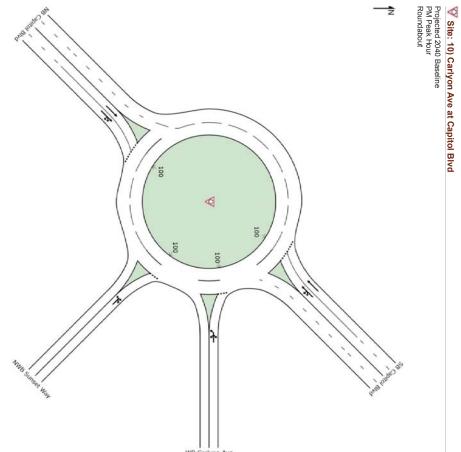
9: Black Lake Belmore Rd & 49th Ave Performance by movement

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

SimTraffic Report 2/17/2016

Tumwater Transportation Master Plan SCJ Alliance

SITE LAYOUT



SIDRA INTERSECTION 6.1 | Copyright © 2000-2015 Akcelik and Associates Pty Ltd | sidrasolutions.com Oganisation SCJ ALLIANCE | Created: Tuesday, February 16, 2016 5:44:03 PM Project. N/Projects\0625 City of Tumwater\0625.17 Tumwater Transportation Master Plan\Traffic\0perations\sidra\2040 Baseline\10\) Carlyon Ave at Capitol Bivd.sip6

MOVEMENT SUMMARY

Site: 10) Carlyon Ave at Capitol Blvd

Projected 2040 Baseline PM Peak Hour Roundabout

	Approach	12x F	12ax F	2x	SouthWest: NB Capitol Blvd	Approach	6x	1×	1bx	NorthEast: SB Capitol Blvd	Approach	16b F	1a l	16	East: WB Carlyon Ave	Approach	18bx F	18x F	3x I	SouthEast: NWB Sunset Way		⊡ _V	Movemen
All Vehicles		R2	R1	11	: NB Capito		11	[2	L3	SB Capitol		R3	7	L3	arlyon Ave		R3	R2	[2	NWB Suns		Mov Mov	t Perform
	1089	26	158	905	Blvd	1637	1537	21	79	Blvd	247	95	142	⇉		74	OI	21	47	et Way		Demand I Total	Movement Performance - Vehicles
3	2.0	2.0	2.0	2.0		2.0	2.0	2.0	2.0		2.0	2.0	2.0	2.0		2.0	2.0	2.0	2.0			Flows HV	nicles
0 728	0.450	0.450	0.450	0.450		0.728	0.728	0.728	0.728		0.476	0.476	0.476	0.476		0.130	0.130	0.130	0.130			Deg. Satn	
100	7.6	7.6	7.6	7.6		14.9	14.9	15.0	15.0		15.4	15.4	15.4	15.4		7.9	7.9	7.9	7.9		sec	Average Delav	
- Os B	LOSA	LOSA	LOSA	LOSA		LOSB	LOSB	LOS B	LOS B		LOS B	LOSB	LOS B	LOS B		LOSA	LOSA	LOSA	LOSA			Level of Service	
æ 0	3.2	3.2	3.2	3.2		8.0	8.0	8.0	8.0		2.5	2.5	2.5	2.5		0.5	0.5	0.5	0.5			95% Back of Queue Vehicles Distan	
2026	80.2	80.2	80.2	80.2		203.6	203.6	203.6	203.6		62.8	62.8	62.8	62.8		12.8	12.8	12.8	12.8			f Queue Distance	
0.59	0.38	0.38	0.38	0.38		0.71	0.71	0.71	0.71		0.74	0.74	0.74	0.74		0.65	0.65	0.65	0.65			Prop. Queued	
0 44	0.21	0.21	0.21	0.21		0.53	0.53	0.54	0.54		0.80	0.80	0.80	0.80		0.65	0.65	0.65	0.65		per veh	Effective Stop Rate	
31.5	33.9	32.9	33.6	33.9		30.5	30.5	30.4	30.7		28.7	28.2	29.0	29.7		31.8	30.8	31.2	32.2			Average Speed	

Level of Service (LOS) Method: Delay & vic (HCM 2010).

Roundabout LOS Method: Same as Signalised intersections.

Vehicle movement LOS values are based on average delay and vic ratio (degree of saturation) per movement Vehicle movement LOS values are based on average delay value (does not apply for approaches and intersection).

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

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 M3D).

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

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Organisation: SCJ ALLANCE | Processed: Wednesday, February 17, 2016 1;52:36 PM
Project: N:Projects/0625 City of Turnwater/0625.17 Turnwater Transportation Master Plan/Traffic/Operations/sidra/2040 Baseline/10) Carlyon Ave at Capitol
Bivd.s/p6

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

Projected 2040 No Build PM Peak Hour

Novement	SEL	SET	TWN	NWR	SWL	SWR
raffic 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
T Channelized		None		None		None
Storage Length					0	
/eh in Median Storage, #		0	0		0	
Grade, %	,	0	0		0	,
Peak Hour Factor	95	95	95	%	95	95
Heavy Vehicles, %	0	0	_	_	0	0
/wmt Flow	174	426	289	147	0	0
//ajor/Minor	Major1		Major2		Minor2	
Conflicting Flow All	437	0		0	1137	363
Stage 1	·				363	
Stage 2					774	
ritical Hdwy	4.1			í	7.1	6.2
itical Hdwy Stg 1					6.1	
Critical Hdwy Stg 2					6.1	
ollow-up Hdwy	2.2				3.5	3.3
ot Cap-1 Maneuver	1134				181	686
Stage 1					660	
Stage 2					394	
Platoon blocked, %						
Mov Cap-1 Maneuver	1134				153	686
Vlov Cap-2 Maneuver					153	
Stage 1				í	527	
Stage 2			l.		315	
	0					
Approach	SE		WW		SW	
HCM Control Delay, s	2.5		0		0	
HCMLOS					Þ	
Ainor Lane/Major Mvmt		NWR SEL	SWLr			
Capacity (vervit)						
HOM Cantrol Dalay (c)		- 0.153	o ,			
HCM Control Delay (s)		- 0./				
HCM Lane LUS						

Tumwater Transportation Master Plan SCJ Alliance

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

Projected 2040 No Build PM Peak Hour

Int Delay, s/veh 4.2	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
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	_	_	0	0
Mvmt Flow	0	0	542	453	379	32
Pidjor/VIIIO	1000		Major I		Majorz	
Stage 1	395		. #	, c		, c
Stage 2	1537	,				
Critical Hdwy	6.4		4.11			
Critical Hdwy Stg 1	5.4					
Critical Hdwy Stg 2	5.4					
Follow-up Hdwy	3.5	,	2.209			
Pot 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	Þ					
Minor Lane/Major Mvmt		EBLn1	SB			
Capacity (veh/h)	1153					
HCM Lane V/C Ratio	0.47					
HCM Control Delay (s)	10.9	- 0				
HCM Lane LOS	В	A				

Tumwaler Transportation Master Plan Synchro 9 Report SCJ Alliance 6/10/2016

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	All
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

Tumwater Transportation Master Plan SCJ Alliance

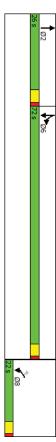
SimTraffic Report 2/17/2016

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

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Natural Cycle: 100 Control Type: Actuated-Uncoordinated	ctuated Cycle Leng	Cycle Length: 120	Area Type:	tersection Summary	Recall Mode	ead-Lag Optimize?	.ead/Lag	otal Lost Time (s)	ost Time Adjust (s)	शा-Red Time (s)	'ellow Time (s)	otal Split (%)	Total Split (s)	linimum Split (s)	linimum Initial (s)	Switch Phase	etector Phase	Permitted Phases	Protected Phases	urn Type	hared Lane Traffic (%	Heavy Vehicles (%)	eak Hour Factor	ravel Time (s)	ink Distance (ft)	ink Speed (mph)	light Turn on Red	aper Length (ft)	Storage Lanes	Storage Length (ft)	deal Flow (vphpl)	uture Volume (vph)	raffic Volume (vph)	ane Configurations	ane Group	
ed-Uncoordinatec	m: 107.8		Other	У	None			4.5	0.0	1.0	3.5	18.3%	22.0	10.0	4.0		00		00		%	1%	0.95	15.0	662	30		25	_	0	1900	235	235	*	WBL	•
					None			4.5	0.0	1.0	3.5	18.3%	22.0	10.0	4.0		00	8		Perm		1%	0.95				Yes		_	225	1900	260	260	74	WBR	-
					None			4.5	0.0	1.0	3.5	21.7%	26.0	24.5	4.0		2		2	NA		1%	0.95	46.3	2035	30					1900	15	15	₽	NBT	→
																						1%	0.95				Yes		0	0	1900	320	320		NBR	*
					Max			4.5	0.0	1.0	3.5	60.0%	72.0	20.0	4.0		6		6	Split		0%	0.95					25	_	0	1900	915	915	s	SBL	•
					Max			4.5	0.0	1.0	3.5	60.0%	72.0	20.0	4.0		6		6	NA		0%	0.95	11.5	505	30					1900	310	310	*	SBT	←

Splits and Phases: 14: 2nd Ave & Custer Way



Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

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

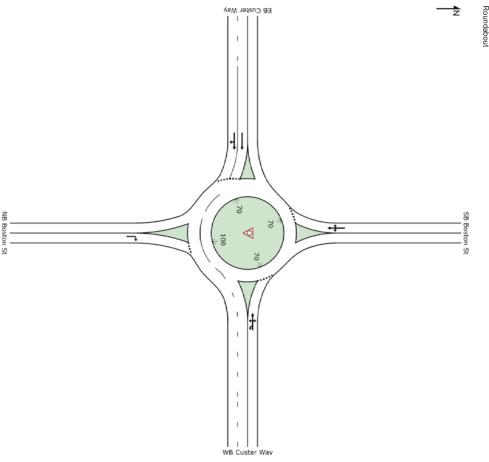
Projected 2040 No Build PM Peak Hour

					39.6 D			HCM 2010 Ctrl Delay HCM 2010 LOS
								Intersection Summary
0.0		4.9				0.4		Green Ext Time (p_c), s
17.5		55.7				15.9		Max Q Clear Time (g_c+l1), s
17.5		67.5				21.5		Max Green Setting (Gmax), s
4.5		4.5				4.5		Change Period (Y+Rc), s
22.0		72.0				20.7		Phs Duration (G+Y+Rc), s
8		6				2		Assigned Phs
8	7	6	5	4	3	2	1	Timer
		C			ш		ш	Approach LOS
		27.9			64.2		67.1	Approach Delay, s/veh
		1289			200		368	Approach Vol, veh/h
		В	C	ш		D	ш	LnGrp LOS
		12.4	33.2	64.2	0.0	45.1	77.8	LnGrp Delay(d),s/veh
		5.3	30.2	7.2	0.0	3.6	10.0	%ile BackOfQ(50%),veh/ln
		0.0	0.0	0.0	0.0	0.0	0.0	Initial Q Delay(d3),s/veh
		0.7	12.4	15.9	0.0	0.6	30.1	Incr Delay (d2), s/veh
		11.7	20.8	48.2	0.0	44.6	47.8	Uniform Delay (d), s/veh
		1.00	1.00	1.00	0.00	1.00	1.00	Upstream Filter(I)
		1.00	1.00	1.00	1.00	1.00	1.00	HCM Platoon Ratio
		1118	1065	303	0	244	273	Avail Cap(c_a), veh/h
		0.29	0.90	0.87	0.00	0.50	0.90	V/C Ratio(X)
		1118	1065	229	0	244	273	Lane Grp Cap(c), veh/h
			1.00	0.92		1.00	1.00	Prop In Lane
		9.8	53.7	13.9	0.0	8.0	15.5	Cycle Q Clear(g_c), s
		9.8	53.7	13.9	0.0	8.0	15.5	Q Serve(g_s), s
		1900	1810	1618	0	1599	1792	Grp Sat Flow(s),veh/h/ln
		326	963	200	0	121	247	Grp Volume(v), veh/h
		1900	1810	1489	129	1599	1792	Sat Flow, veh/h
		0.59	0.59	0.14	0.14	0.15	0.15	Arrive On Green
		1118	1065	211	18	244	273	Cap, veh/h
		0	0	_	_	_	_	Percent Heavy Veh, %
		0.95	0.95	0.95	0.95	0.95	0.95	Peak Hour Factor
		_	_	0	_	_	_	Adj No. of Lanes
		326	963	184	16	121	247	Adj Flow Rate, veh/h
		1900	1900	1900	1881	1881	1881	Adj Sat Flow, veh/h/ln
		1.00	1.00	1.00	1.00	1.00	1.00	Parking Bus, Adj
			1.00	1.00		1.00	1.00	Ped-Bike Adj(A_pbT)
		0	0	0	0	0	0	Initial Q (Qb), veh
		6	_	12	2	18	ω	Number
		310	915	320	15	260	235	Future Volume (veh/h)
		310	915	320	15	260	235	Traffic Volume (veh/h)
		→	Ħ		₩	-14	H	Lane Configurations
		SBT	SBL	NBR	NBT	WBR	WBL	Movement
		+	*	7	_	1	4	
		-	_	,	•	•		

Tumwater Transportation Master Plan SCJ Alliance

W Site: 15) Custer Way at Boston St

Projected 2040 Baseline Roundabout



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Project: N/Projects/0625 City of Turnwater/0625.17 Turnwater Transportation Master PlanTraffic/Operations/sidra/2040 Baseline/15-Custer Way at Boston
St.sip6

MOVEMENT SUMMARY

W Site: 15) Custer Way at Boston St

Projected 2040 Baseline Roundabout

Movement Performance - Vehicles	nance - Ve	hicles								
Mov OD	Demand	Flows	Deg.	Average	Level of	95% Back of Queue	if Queue	Prop.	Effective	Average
ID Mov	Total HV	ξ¥	Satn	Delay		Vehicles	Distance #	Queued	Stop Rate	Speed
South: NB Boston St										
18 R2	121	2.0	0.234	10.2	LOS B	1.1	26.8	0.72	0.72	31.7
Approach	121	2.0	0.234	10.2	LOSB	1.1	26.8	0.72	0.72	31.7
East WB Custer Way	~									
1u U	26	2.0	0.697	13.0	LOS B	0.0	0.0	0.00	0.00	37.1
1 5	247	2.0	0.697	13.0	LOS B	0.0	0.0	0.00	0.00	36.1
6 T1	568	2.0	0.697	13.0	LOS B	0.0	0.0	0.00	0.00	36.3
16 R2	σı	2.0	0.697	13.0	LOS B	0.0	0.0	0.00	0.00	35.4
Approach	847	2.0	0.697	13.0	LOSB	0.0	0.0	0.00	0.00	36.2
North: SB Boston St										
7 12	51	2.0	0.027	6.5	LOS A	0.1	3.6	0.70	0.54	33.0
4 T1	ъ	2.0	0.027	6.5	LOS A	0.1	3.6	0.70	0.54	32.8
14 R2	ഗ	2.0	0.027	6.5	LOS A	0.1	3.6	0.70	0.54	32.1
Approach	16	2.0	0.027	6.5	LOS A	0.1	3.6	0.70	0.54	32.6
West: EB Custer Way	~									
2 T1	1047	2.0	0.609	11.4	LOS B	5.4	136.1	0.67	0.55	31.7
12 R2	279	2.0	0.609	11.1	LOS B	5.3	134.8	0.67	0.53	30.7
Approach	1326	2.0	0.609	11.4	LOSB	5.4	136.1	0.67	0.54	31.4
All Vehicles	2311	2.0	0.697	11.9	LOSB	5.4	136.1	0.43	0.35	33.1

Level of Service (LOS) Method: Delay & vic (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 ratio (movement LOS values are based on average 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 M3D).

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

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Organisation: SCLALLIANCE | Processed: Tuesday, February 16, 2015 5-16,04 Pty
Project: N.Projects/0625 City of Turnwater/0625,17 Turnwater Transportation Master PlanTrafficOperations/sidra/2040 Baseline/15-Custer Way at Boston
5.3.16

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

•

PM Peak Hour

	Projecte	
	ed 2040	
2	0	
	$\frac{8}{8}$	
	₿	

	•					4	
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	
Lane Configurations	-<		₽)			2 ,	
Traffic Volume (vph)	180	290	615	70	100	290	
Future Volume (vph)	180	290	615	70	100	290	
Ideal Flow (vphpl)	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		Perm	NA	
Protected Phases	000		2			6	
Permitted Phases					6		
Detector Phase	00		2		6	6	
Switch Phase							
Minimum Initial (s)	4.0		4.0		4.0	4.0	
Minimum Split (s)	20.0		20.0		20.0	20.0	
Total Split (s)	21.0		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	
Total Lost Time (s)	4.0		4.0			4.0	
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	None		Min		Min	Min	
Intersection Summary							
Area Type:	Other						
Cycle Length: 55							
Actuated Cycle Length: 45.1							
Natural Cycle: 55							
Control Type: Actuated-Uncoordinated	ordinated						

Splits and Phases: 16: Deschutes Way & Boston St



Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

HCM 2010 Signalized Intersection Summary 16: Deschutes Way & Boston St

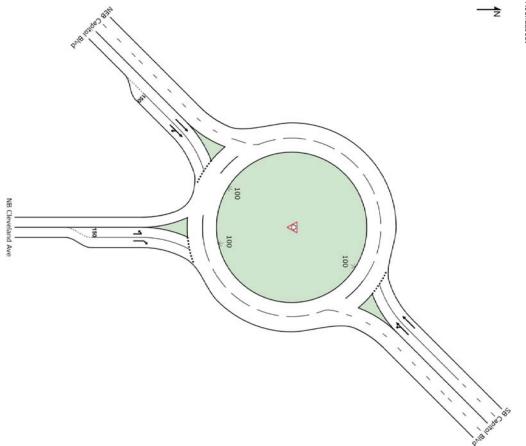
Projected 2040 No Build PM Peak Hour

	^	*	→	*	•	←	
Movement	WBL	WBR	NBT	NBR	SBL	SBT	
Lane Configurations	≺		₹			٤,	
Traffic Volume (veh/h)	180	290	615	70	100	290	
Number	ے د	18	<u>ه</u> و	13 2		290	
Initial Q (Ob), veh	0 0	0 5	0 ^	0 12	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/h/ln	1881	1900	1900	1900	1900	1900	
Adj Flow Rate, veh/h	189	305	647	74	105	305	
Adj No. of Lanes	0	0	_	0	0	_	
	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	
Grp Volume(v), veh/h	495	0	0	721	410	0	
O Serve(a s) s	15.1	000	000	15.7	470	000	
Cycle Q Clear(q_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 Grp Cap(c), veh/h	538	80	000	0.74	000	30	
Avail Can(c a) veh/h	538	0.00	0.00	1063	660	0.00	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	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	
%ile RackOfO(50%) veh/in	100	0.0	0.0	8.7	5.7	0.0	
LnGrp Delay(d),s/veh	38.3	0.0	0.0	12.1	12.7	0.0	
LnGrp LOS	D			В	В		
Approach Vol, veh/h	495		721			410	
Approach LOS	D 30.3		B -			B	
Timer	_	2	w	4	57	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
Green Ext Time (p. c). s		6.4				3.8	0.0
Intersection Cumman							
HCM 2010 Ctd Dolay			30				
HCM 2010 CIT Delay			20.2				
TOW FOLD FOO			c				
Notes							

Tumwater Transportation Master Plan SCJ Alliance

Site: 17) Cleveland Ave at Capitol Blvd

Projected 2040 Baseline Roundabout



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MOVEMENT SUMMARY

Site: 17) Cleveland Ave at Capitol Blvd

Projected 2040 Baseline Roundabout

MOVE	MOVELLELL FELLOLLIGITCE - VELICIES	Illalice - ve	111000								
Mov	OD	Demand Flows	Flows	Deg.	Average	Level of	95% Back of	f Queue	Prop.	Effective	
				Satn	Delay				Queued	Stop Rate	
										per veh	
South: N	South: NB Cleveland Ave	d Ave									
36	Ľ	26	2.0	0.059	8.8	LOS A	0.2	5.5	0.61	0.59	
18a	꼰	311	2.0	0.382	9.0	LOS A	1.9	49.2	0.67	0.68	
Approach	Sh	337	2.0	0.382	9.0	LOS A	1.9	49.2	0.67	0.68	
NorthEa	NorthEast: SB Capitol Blvd	tol Blvd									
1ax	Z	468	2.0	0.663	11.3	LOS B	7.4	187.8	0.27	0.09	
6x	7.	1268	2.0	0.663	11.3	LOSB	7.4	187.8	0.27	0.09	
Approach	S	1737	2.0	0.663	11.3	LOSB	7.4	187.8	0.27	0.09	
SouthW	SouthWest: NEB Capitol Blvd	apitol Blvd									
2x	Τ1	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	ch	811	2.0	0.434	8.9	LOS A	2.6	66.7	0.64	0.56	
All Vehicles	cles	2884	2.0	0.663	10.4	LOSB	7.4	187.8	0.42	0.29	

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

Roundabout LOS Method: Same as Signalised Intersections.

Roundabout LOS walues are based on average delay and v/c ratio (degree of saturation) per movement vehicle movement. Post in 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.

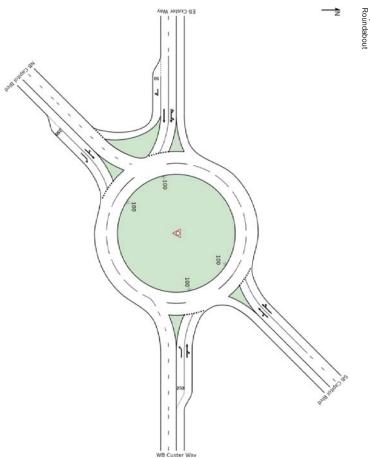
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: NIProjects/0625 City of Turnwater/0625.17 Turnwater Transportation Master Plan/Traffic/Operations/sidra/2040 Baseline/17-Cleveland Ave at Capitol
Bivd.sip6

W Site: 18) Custer Way at Capitol Blvd

Projected 2040 Baseline



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Bird.s/p6

MOVEMENT SUMMARY

Site: 18) Custer Way at Capitol Blvd

Projected 2040 Baseline Roundabout

₽₩	M 0 0	Demand Flows Total HV	Flows	Deg. Satn	Average Delav	Level of Service	95% Back o	f Queue Distance	Prop.	Effective Stop Rate	Average Speed
		veh/h			sec		veh			per veh	mph
East W	East: WB Custer Way	-									
à	ニ	200	2.0	0.508	20.8	LOSC	3.7	94.1	0.92	1.00	26.8
6	-	442	2.0	0.841	37.2	LOSD	12.5	317.8	1.00	1.38	23.6
16b	R3	51	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	LOSC	12.5	317.8	0.97	1.26	24.5
NorthEa	NorthEast: SB Capitol Blvd	ol Blvd									
1bx	ធ	37	2.0	0.830	28.4	LOSC	9.3	236.5	0.95	1.15	26.1
6x	-	911	2.0	0.830	27.7	LOSC	9.6	244.8	0.95	1.15	26.1
16ax	꼰	316	2.0	0.830	26.5	LOSC	9.6	244.8	0.96	1.15	26.3
Approach	Sh.	1263	2.0	0.830	27.4	LOSC	9.6	244.8	0.95	1.15	26.1
West: E	West: EB Custer Way	žΫ									
5u	C	26	2.0	0.850	36.4	LOSD	9.1	230.8	0.99	1.25	23.4
5a	ニ	379	2.0	0.850	36.4	LOSD	9.1	230.8	0.99	1.25	22.8
2	7	721	2.0	0.850	30.5	LOSC	10.3	261.1	1.00	1.27	25.2
12b	ఔ	79	2.0	0.099	5.5	LOS A	0.6	14.2	0.75	0.65	33.4
Approach	h	1205	2.0	0.850	30.8	LOSC	10.3	261.1	0.98	1.22	24.7
SouthW	SouthWest: NB Capitol Blvd	itol Blvd									
5bx	ნ	21	2.0	1.032	73.4	LOS F	20.8	528.5	1.00	1.78	17.3
2 _X	1	563	2.0	1.032	73.4	LOS F	20.8	528.5	1.00	1.78	17.2
12ax	꼰	195	2.0	0.538	23.6	LOSC	2.9	73.8	0.84	0.90	27.2
Approach	¥	779	2.0	1.032	60.9	LOSE	20.8	528.5	0.96	1.56	18.9
All Vehicles	cles	3895	2.0	1.032	36.0	LOSD	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 wic 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).

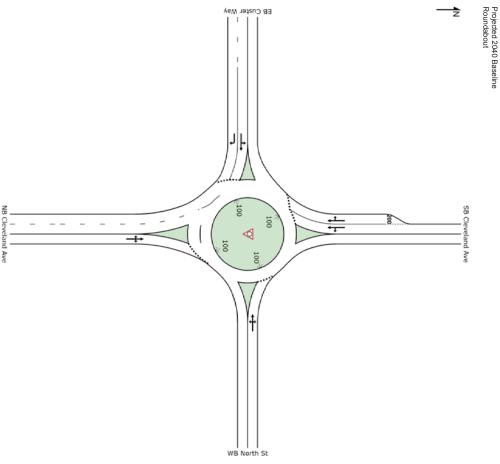
Roundabout Capacity Model: SIDRA Standard.

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 M3D). HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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₩ Site: 19) Custer Way at Cleveland Ave/North St



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Bivd.s/p6

MOVEMENT SUMMARY

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

Projected 2040 Baseline Roundabout

Movement Performance - Vehicles	mance - Ve	hiclos								
Mov OD	Demand	Flows	Den	Average	l evel of	95% Rack of Ollelle	Ollelle	Drop	Π # ective	Average
Mov	Total HV	₹	Satn	Delay	Service	Vehicles	Distance	Queued	Stop Rate	Speed
									per veh	mph
South: NB Cleveland Ave	Ave									
3 12	163	2.0	0.683	21.8	LOSC	6.5	166.3	0.93	1.06	27.3
8 T1	216	2.0	0.683	21.8	LOSC	6.5	166.3	0.93	1.06	27.3
18 R2	21	2.0	0.683	21.8	LOSC	6.5	166.3	0.93	1.06	26.7
Approach	400	2.0	0.683	21.8	LOSC	6.5	166.3	0.93	1.06	27.3
East: WB North St										
1 5	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	LOSB	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	Ave									
7 12	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 Custer Way	~									
5 12	74	2.0	0.587	11.9	LOS B	5.8	146.5	0.85	0.80	31.6
	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	LOSB	3.0	75.6	0.77	0.70	31.3
Approach	889	2.0	0.587	11.3	LOSB	5.8	146.5	0.82	0.76	31.5
All Vehicles	2437	2.0	0.683	13.3	LOSB	6.5	166.3	0.84	0.82	30.6
l evel of Service (LOS) Method: Delay & v/c (HCM 2010)	Method: De	olav & v/c	(HCM 2010)							

Level of Service (LCS) Method: Delay & vic (HCM 2010).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay and vic ratio (degree of saturation) per movement LOS Teven are based on average delay and vic ratio (degree of saturation) per movement LOS F will result if vic > 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 (vic not used as specified in HCM 2010).

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies Roundabout Capacity Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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HCM 2010 TWSC 20: Hoadly St & North St

Projected 2040 No Build PM Peak Hour

Approach HCM Control Delay, s HCM LOS HCMIOS HCM LOS HCM LOS Minor Lane/Major Mynnt Capacity (veh/h) Capacit	EB trol Delay, s 1.3 Bellajor Mymit NBLn1 verhin 219 VCC Railo 0.882	EB Irol Delay, s 1.3 ReMajor Mvmt NBLn1 Veh/h) 219	EB 1.3 irol Delay, s 1.3	irol Delay, s	trol Delay, s	trol Delay, s			Stage 2 -	Stage 1 -	Mov Cap-2 Maneuver -	Mov Cap-1 Maneuver 898	Stage 2 -		Pot Cap-1 Maneuver 898		Critical Hdwy Stg 2 -		Critical Hdwy 4.11		Stage 1 -	low All 705	Major/Minor Major1	Mvmt Flow 79 500	1	r Factor 95		Storage, # -	Storage Length -	zed -	Free	#/hr 0	Future Vol, veh/h 75 475	, veh/h 75	Movement EBL EBT	Int Delay, s/veh 3.8	Intersection
m	m	l _m							ľ	•					•						•	0		0	_			0	•	- None		0	5		3T EBR		
0 1 1				BT E						•	•			٠	•	٠					•	0		5	_	95				ne :	æ	0	57	5	Ħ		
- 0.015			- 1065	3R WBI			0.2	WB				1065			1065	2.209			4.11			505	Major2	16	_	95					Free		15	1	WBL		
•			5	L WBT			2	w	ľ	Ċ	ľ	5			5	9						5 0	2	6 621				- 0			Ŧ			5 590	L WBT		
				WBR SBLn1																		0		84						None			80		WBR		
		19	146	n1		C	22.9	NB	392	399	104	104	428	455	125	3.5	6.1	6.1	7.1	709	661	1370	Minor1	2	0	95					Stop	0	2	2	NBL		
									41/	407	122	122	428	463	142	4	5.5	5.5	6.5	737	661	1398		5	0	95	0	0			Stop	0	5	5	NBT		
												573			573	3.3			6.2			503		=	0	95				None	Stop	0	10	10	NBR		
						F	53.6	SB	384	383	106	106	451	436	126	3.5	6.1	6.1	7.1	668	695	1363	Minor2	47	0	95					Stop	0	45	45	SBL		
									406	436	128	128	462	447	150	4	5.5	5.5	6.5	663	695	1358		2	0	95	0	0			Stop	0	2	2	SBT		
												465			465	ယ	,		6.2			663		26	0	95				None	Stop	0	25	25	SBR		

Tumwater Transportation Master Plan
Synchro 9 Report
SCJ Alliance
6/10/2016

SimTraffic Performance Report

Projected 2040 Baseline PM Peak Hour

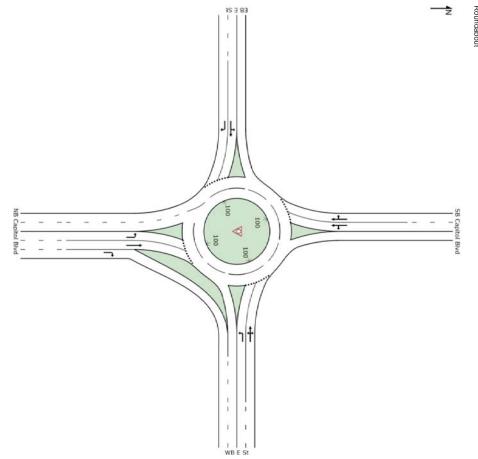
21: I-5 NB Off-Ramp/Deschutes Way & E St Performance by movement

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

Tumwaler Transportation Waster Plan
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♥ Site: 22) E St at Capitol Blvd

Projected 2040 Baseline Roundabout



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MOVEMENT SUMMARY

W Site: 22) E St at Capitol Blvd

Projected 2040 Baseline Roundabout

Movem	Movement Performance - Vehicles	nance - Ve	hicles								
Mov	OD	Demand Flows	Flows	Deg.	Average	Level of	95% Back of Queue	f Queue	Prop.	Effective	Average
₹		veh/h	_%	v/c	Sec		veriicies	tt Distallice	Manan	per veh	udu naado
South: N	South: NB Capitol Blvd										
ω	2	211	2.0	0.274	7.8	LOS A	1.8	46.3	0.78	0.69	31.4
00	7	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	5	1268	2.0	0.439	4.3	LOS A	3.7	92.8	0.44	0.38	34.7
East: WB E St	3 E St										
_	2	674	2.0	0.710	18.3	LOS B	6.6	168.0	0.86	0.98	27.8
6	7	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	ד	1205	2.0	0.710	17.4	LOS B	6.6	168.0	0.86	0.97	28.5
North: SE	North: SB Capitol Blvd	2									
7	2	232	2.0	1.062	85.0	LOSF	23.7	601.8	1.00	1.96	15.7
4	7	916	2.0	1.062	79.3	LOSF	29.1	740.3	1.00	2.05	16.3
14	R2	142	2.0	1.062	76.1	LOSF	29.1	740.3	1.00	2.10	16.5
Approach	ד	1289	2.0	1.062	79.9	LOSE	29.1	740.3	1.00	2.04	16.2
West: EB E St	3 E St										
GI	2	63	2.0	0.917	47.9	LOSD	12.6	319.5	1.00	1.49	21.2
2	71	437	2.0	0.917	47.9	LOSD	12.6	319.5	1.00	1.49	21.1
12	R2	342	2.0	0.895	56.2	LOSE	9.2	232.9	0.97	1.35	19.1
Approach	ה	842	2.0	0.917	51.3	LOSD	12.6	319.5	0.99	1.44	20.3
All Vehicles	les	4605	2.0	1.062	37.5	LOSD	29.1	740.3	0.81	1.19	23.0

Level of Service (LOS) Method: Delay & vic (HCM 2010).

Roundabout LOS Method: Same as Signalised intersections.

Vehicle movement LOS values are based on average delay and vic ratio (degree of saturation) per movement LOS F will result if vic > 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 (vic not used as specified in HCM 2010).

Roundabout Capacity Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation. HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies

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Organisation: SOLAL LIANCE | Processed: Tuesday, February 16, 2016 542-2P M
Project: N.:Projects/0625 City of Turnwater/0625, 17 Turnwater/Transportation Master Plan/Traffic/Operations/sidra/2040 Baseline/22-E St-Cap.sp6

HCM 2010 TWSC 23: Cleveland Ave & South St

Projected 2040 No Build PM Peak Hour

HCM 95th %tile Q(veh)	HCM Lane LOS	HCM Control Delay (s)	HCM Lane V/C Ratio	Capacity (veh/h)	Minor Lane/Major Mvmt	HCM LOS	HCM Control Delay, s	Approach	Stage 2	Stage 1	Mov Cap-2 Maneuver	Mov Cap-1 Maneuver	Platoon blocked, %	Stage 2	Stage 1	Pot Cap-1 Maneuver	Follow-up Hdwy	Critical Hdwy Stg 2	Critical Hdwy Stg 1	Critical Hdwy	Stage 2	Stage 1	Conflicting Flow All	Major/Minor	Mvmt Flow	Heavy Vehicles, %	Peak Hour Factor	Grade, %	Veh in Median Storage, #	Storage Length	RT Channelized	Sign Control	Conflicting Peds, #/hr	Future Vol, veh/h	Traffic Vol, veh/h	Movement	пи оснаў, этесп	Int Delay shick	Interception
					NBT	C	20.5	WB	293	334	55	55		424	334	80	3.5	5.8	5.8	6.8	768	968	1736	Minor1	5	0	95	0	0	0		Stop	0	5	5	WBL	č	л	
- 0.7	- C	- 20.5		- 285	NBRWBLn1							532				532	3.3			6.9			487		47	0	95				None	Stop	0	45	45	WBR			
0.3	В	10.6		710	SBL																																		
	Þ	1.5			SBT																			Ma								_				_			
							0	NB				·						·		÷		·	0	lajor1	963	_	95	0	0			Free	0	915	915	NBT			
																							0		=	_	95				None	Free	0	10	10	NBR			
							1.9	SB	ļ.			710				710	2.21			4.12			974	Major2	63	_1	95					Free	0	60	60	SBL			
												,								í			0		1284		95					Free			1220	SBT			

Synchro 9 Report 6/10/2016

Tumwater Transportation Master Plan SCJ Alliance

HCM 2010 TWSC 24: Linwood Ave & 7th Ave

Projected 2040 No Build PM Peak Hour

HCM Lane LOS	HCM Control Delay (s)	HCM Lane V/C Ratio	Capacity (veh/h)	Minor Lane/Major Mvmt	HCM LOS	HCM Control Delay, s	Approach	Stage 2	Stage 1	Mov Cap-2 Maneuver	Mov Cap-1 Maneuver	Platoon blocked, %	Stage 2	Stage 1	Pot Cap-1 Maneuver	Follow-up Hdwy	Critical Hdwy Stg 2	Critical Hdwy Sta 1	Critical Hdwv	Stage 2	Stage 1	Conflicting Flow All	Major/Minor	Mvmt Flow	Heavy Vehicles, %	Peak Hour Factor	Grade, %	Veh in Median Storage, #	Storage Length	RT Channelized	Sign Control	Conflicting Peds, #/hr	Future Vol, veh/h	Traffic Vol, veh/h	Movement	Int Delay, s/veh 8	Intersection
> >	9.1		887	NBLn1		1.2	EB				1017				1017	2.227			4.13		, ,	547	Major1	26	ω	95				,	Free	0	25	25	EBL	ίπ	
2 A	8.6	0.026	1017	EBL				,	,		,		,								, ,	0		163	ω	95	0	0		í	Free	0	155	155	EBT		
Þ	0			EBT					1													٥		0	ω	95				None	Free	0	0	0	EBR		
	,	ŀ		EBR																			<														
Þ	7.5	0.001	1422	WBL		0	WB		,		1422				1422	2.209			4.11		, 5	163	lajor2		_	95					Free	0	_	_	WBL		
Þ	0			WBT					,													0		363	_	95	0	0			Free	0	345	345	WBT		
- D	- 32.5	- 0.675	- 374	WBR SBLn1						•											, c	0		184	_	95				None	Free	0	175	175	WBR		
					⊳	9.1	NB	558	769	345	345		579	791	365	3.5	6.1	6.1	7.1	468	216	684	Minor1	0	0	95					Stop	0	0	0	NBL		
								519	708	326	326		520	728	336	4	55	5.5	6.5	549	216	765		0	0	95	0	0		í	Stop	0	0	0	NBT		
											887				887	ယ		. i	6.2		, 5	163		_	0	95				None	Stop	0	_	_	NBR		
					D	32.5	SB	766	569	361	361		789	585	370	3.509	6.11	6.11	7.11	216	457	673	Minor2	232	_	95					Stop	0	220	220	SBL		
								706	568	367	367		726	569	378	4.009	5.51	5.51	6.51	216	457	673		0	_	95	0	0	,		Stop	0	0	0	SBT		
								l,	,		607				607	3.309			6.21			455		21		95				None	Stop	0	20	20	SBR		

Tumwater Transportation Master Plan SCJ Alliance

HCM 2010 AWSC 25: Linwood Ave & 2nd Ave

Projected 2040 No Build PM Peak Hour

Intersection											
Intersection Delay, s/veh Intersection LOS	57.6 F										
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT
Traffic Vol, veh/h	0	130	145	130	0	250	305	65	0	180	305
Future Vol, veh/h	0	130	145	130	0	250	305	65	0	180	305
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
Heavy Vehicles, %	2	_	_	_	2	_	_	_	2	0	0
Mvmt Flow	0	137	153	137	0	263	321	68	0	189	321
Number of Lanes	0	_	_	0	0		_	0	0		_
Approach		EB				WB				NB	
Opposing Approach		WB				EB				SB	
Opposing Lanes		2				2				2	
Conflicting Approach Left		SB				NB				ΕB	
Conflicting Lanes Left		2				2				2	
Conflicting Approach Right		NB				SB				WB	
Conflicting Lanes Right		2				2				2	
HCM Control Delay		35				62				61	
HCM LOS		D				т				'n	
Lane		NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2		
Vol Left, %		100%	0%	100%	0%	100%	0%	100%	0%		
Vol Thru, %		0%	82%	0%	53%	0%	82%	0%	65%		
Vol Right, %		0%	18%	0%	47%	0%	18%	0%	35%		
Sign Control		Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop		
Traffic Vol by Lane		180	370	130	275	250	370	180	510		
LT Vol		180	0	130	0	250	0	180	0		
Through Vol		0	305	0	145	0	305	0	330		
RT Vol		0	65	0	130	0	65	0	180		
Lane Flow Rate		189	389	137	289	263	389	189	537		
Geometry Grp		7	7	7	7	7	7	7	7		
Degree of Util (X)		0.543	_	0.407	0.795	0.749	_	0.549	_		
Departure Headway (Hd)		10.324	9.703	10.717	9.888	10.242	9.621	10.429	9.644		
Convergence, Y/N		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Cap		351	378	338	368	355	378	351	381		
Service Time		8.049	7.428	8.428	7.599	7.964	7.343	8.062	7.317		
HCM Lane V/C Ratio		0.538	1.029	0.405	0.785	0.741	1.029	0.538	1.409		
HCM Control Delay		24.7	78.6	20.6	41.8	38	78.2	25	78.1		
HCM Lane LOS		C	'n	C	т	ш	П	C	П		
		د.	110	1.9	67	57	11 8	w	11.8		
				7					·		

Synchro 9 Report 6/10/2016

Tumwater Transportation Master Plan SCJ Alliance

HCM 2010 AWSC 25: Linwood Ave & 2nd Ave

Projected 2040 No Build PM Peak Hour

Intersection					
Intersection Delay, s/veh					
Intersection LOS					
Movement	SBU	SBL	SBT	SBR	
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	_	_	_	
Mvmt Flow	0	189	347	189	
Number of Lanes	0	_	_	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		T			
lano					

Tumwater Transportation Master Plan SCJ Alliance

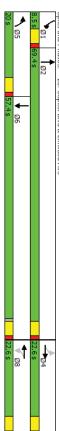
Lanes, Volumes, Timings
26: Capitol Blvd & Linwood Ave

Projected 2040 No Build PM Peak Hour

	J,	₩	ב	_# NOT	₩	10 N	J# NDL	→	NBK	™	SBT
Traffic Volume (vph)	115	ى م ئ	255	f 5 _	ი ა	10	215	1090	3 3	d d _	
Future Volume (vph)	115 1900	1900 5	255 1900	1900	1900	1900	215	1900	1900	1900	
Storage Length (ft)	150		0	100		0	150		0	150	
Storage Lanes			0	_		0	_		0	_	
Taper Length (ft)	25			25			25			25	
Right Turn on Red			Yes			Yes			Yes		
Link Speed (mph)		30			30			30			
Link Distance (ft)		489			427			2664			
Travel Time (s)		11.1			9.7			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	
Heavy Vehicles (%)	1%	2%	1%	2%	2%	2%	1%	1%	2%	2%	
Shared Lane Traffic (%)											
Turn Type	Perm	NA		Perm	Z		Prot	A		Prot	
Protected Phases		4		,	00		5	2		_	
Permitted Phases	4			00							
Detector Phase	4	4		00	00		5	2		_	
Switch Phase											
Vlinimum Initial (s)	5.0	5.0		4.0	4.0			15.0		4.0	
Vlinimum Split (s)	22.5	22.5		20.5	20.5			20.0		8.5	
Total Split (s)	22.6	22.6		22.6	22.6			69.4		8.5	
Total Split (%)	22.5%	22.5%		22.5%	22.5%			69.1%		8.5%	
Yellow Time (s)	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	
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								Lag		Lead	Lag
Lead-Lag Optimize?								Yes		Yes	
Recall Mode	None	None		None	None			Max		None	
Intersection Summary											
Area Type: O	Other										
Actuated Cycle Length: 94.2											
Natural Cycle: 100											

Splits and Phases: 26: Capitol Blvd & Linwood Ave

Control Type: Actuated-Uncoordinated



Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

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

Projected 2040 No Build PM Peak Hour

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	J,	¥		_#	¥		J,	}		Ħ	→	
Traffic Volume (veh/h)	115	ω.	255	귱.	ъ.	10	215	1090	5	10.	1425	400
Future Volume (veh/h)	115	57	255	15	57	10	215	1090	15	10	1425	400
Number	7	4	14	ω	8	18	5	2	12		6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1900	1863	1863	1900	1881	1881	1900	1863	1881	1900
Adj Flow Rate, veh/h	121	5	268	16	5	=	226	1147	16	=	1500	421
Adj No. of Lanes	_	_	0	_	_	0	_	2	0	_	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, %	_	2	2	2	2	2	_	_	_	2	_	_
Cap, veh/h	317	5	286	88	94	208	270	2424	34	19	1482	398
Arrive On Green	0.18	0.18	0.18	0.18	0.18	0.18	0.15	0.67	0.67	0.01	0.53	0.53
Sat Flow, veh/h	1405	29	1574	1102	519	1142	1792	3609	50	1774	2787	749
Grp Volume(v), veh/h	121	0	273	16	0	16	226	568	595	1	938	983
Grp Sat Flow(s),veh/h/ln	1405	0	1603	1102	0	1661	1792	1787	1872	1774	1787	1749
Q Serve(g_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 Clear(g_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	317	>	0.98	00.1	>	0.69	00.I	1300	0.03	1.00	000	0.43
Lane Gip Cap(c), verm	029	000	0.04	0 10	000	202	0/2	0.47	0.47	0.50	000	106
Avail Cap(c_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(I)	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	_ ယ	26.1	26.1	45.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/in	3.0	0.0	7.0.2	0.5	0.0	0.4	7.4	6.9	8.2	0.4	31.9	3/.2
Livel breadyd),syven	37.4	0.0	/5./	0.00	0.0	33.1	59.1	2.4	> -	75.	49.1	09.1
LIPIDLOS	-	2	г	-		C	г	A	A	r		
Approach Vol, veh/h		394			32			1389			1932	
Approach Delay, s/veh		63.9			41.9			17.3			59.4	
Approach LOS		ш			D			В			ш	
Timer		2	ω	4	5	6	7	œ				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.5	71.3		22.6	19.5	57.4		22.6				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	4.0	64.9		18.1	15.5	52.9		18.1				
Max Q Clear Time (g_c+l1), s	2.6	17.2		18.7	14.2	54.9		20.1				
Green Ext Time (p_c), s	0.0	35.6		0.0	0.0	0.0		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			44.1									
HCM 2010 LOS			D									

Tumwater Transportation Master Plan SCJ Alliance

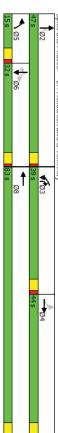
Lanes, Volumes, Timings 27: Henderson Blvd & Yelm Hwy

Projected 2040 No Build
PM Peak Hour

P P P P P P P P P P		·	ļ	4	•	†	/	≯	₫ →	•	*	4	
1)) 10 955 195 510 780 85 140 200 700 230 1900 1905 195 195 510 780 85 140 200 700 230 1900 1900 1900 1900 1900 1900 1900 19	Lane Group Lane Configurations	EBL.	≱	EBR	WBL	₩BT	WBR	NBL	NBT	NBR	SBL	SBT	
1) 10 955 195 510 780 85 140 200 700 230 335 1900 1900 1900 1900 1900 1900 1900 190	Traffic Volume (vph)	10.	955	195	510	780	85	140	200	700	230	335	
1900 1900	Future Volume (vph)	10	955	195	510	780	85	140	200	700	230	335	
200 0 450 0 200 100 0 201 101 1 1 1 1 1 1 1 1 1	Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
1	Storage Length (ft)	200		0	450		0	200		100	0		
25 25 25 25 25 25 25 25 25 25 25 25 25 2	Storage Lanes			0	_		0	_		_	_		
Perm VAS VAS <td>Taper Length (ft)</td> <td>25</td> <td></td> <td></td> <td>25</td> <td></td> <td></td> <td>25</td> <td></td> <td></td> <td>25</td> <td></td> <td></td>	Taper Length (ft)	25			25			25			25		
30	Right Turn on Red			Yes			Yes			Yes			
1947 1645 3441 1606 3452 3461 3461 3461 3466 3461 3466 3465	Link Speed (mph)		30			30			30			30	
Add Add	Link Distance (ft)		1947			1645			3441			1606	
0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95	Travel Time (s)		44.3			37.4			78.2			36.5	
) 1% 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	
C(%) Perm NA Prot NA Prot NA pm+ov Perm NA 4 4 3 8 5 2 3 6 6 4 4 3 8 5 2 3 6 6 6.0 6.0 5.0 6.0 5.0 5.0 5.0 6.0 6 4.0 4.0 5.0 5.0 5.0 5.0 5.0 6.0	Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	
Perm NA Prot NA Prot NA pm+ov Perm NA 4 4 3 8 5 2 3 6 6 4 4 3 8 5 2 3 6 6 60 60 60 50 60 50 60 60 60 60 60 50 60 50 60 50 60	Shared Lane Traffic (%)												
A	Turn Type	Perm	NA		Prot	NA		Prot	NA	pm+ov	Perm	NA	
4 4 4 3 8 5 2 3 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	Protected Phases		4		ω	00		5	2	ω		6	
A 4 4 3 8 5 2 3 6 6 6.0 6.0 5.0 6.0 5.0 6.0 5.0 6.0 24.5 24.5 9.5 24.5 9.5 24.5 9.5 24.5 44.0 44.0 39.0 83.0 15.0 47.0 39.0 32.0 32.0 33.8% 33.8% 30.0% 63.8% 11.5% 36.2% 30.0% 24.6% 24.6% 33.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 9) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Permitted Phases	4								2	6		
6.0 6.0 5.0 6.0 5.0 6.0 5.0 6.0 6.0 6.0 6.0 6.0 6.0 6.0 6.0 6.0 6	Detector Phase	4	4		ω	00		5	2	ω	6	6	
Cherry C	Switch Phase												
245 245 9.5 245 9.5 245 9.5 245 245 245 245 245 245 245 245 245 24	Minimum Initial (s)	6.0	6.0		5.0	6.0		5.0	6.0	5.0	6.0	6.0	
44.0 44.0 39.0 83.0 115.0 47.0 39.0 32.0 32.0 32.0 33.8% 33.8% 33.8% 53.5 35.	Minimum Split (s)	24.5	24.5		9.5	24.5		9.5	24.5	9.5	24.5	24.5	
33.8% 33.8% 30.0% 63.8% 11.5% 36.2% 30.0% 24.6% 24.6% 35. 35. 35. 35. 35. 35. 35. 35. 35. 35.	Total Split (s)	44.0	44.0		39.0	83.0		15.0	47.0	39.0	32.0	32.0	
3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5	Total Split (%)	33.8%	33.8%		30.0%	63.8%		11.5%	36.2%	30.0%	24.6%	24.6%	N)
1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 (s) 0.0	Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	
Adjust (s) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 Time (s) 4.5	All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Time (s) 4.5 4	Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Dplimize? Lag Lag Lead Lead Lag Lag Splimize? Yes	Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Dplimize? Yes	Lead/Lag	Lag	Lag		Lead			Lead		Lead	Lag	Lag	
le Max Max None Max None None None None None None Olher	Lead-Lag Optimize?	Yes	Yes		Yes			Yes		Yes	Yes	Yes	
Summary	Recall Mode	Max	Max		None	Max		None	None	None	None	None	
	Intersection Summary												
	Агеа Туре:	Other											

Splits and Phases: 27: Henderson Blvd & Yelm Hwy

Cycle Length: 130
Actuated Cycle Length: 130
Natural Cycle: 140
Control Type: Actuated-Uncoordinated



Tumwater Transportation Master Plan SCJ Alliance

HCM 2010 Signalized Intersection Summary 27: Henderson Blvd & Yelm Hwy

Projected 2040 No Build PM Peak Hour

	1	ţ	1	1	Ť	1	۶	→	*	•	—	•
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	Ħ	ᢌ		_#	→		J.	→	-4	Ħ	→	-4
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	ω	00	18	5	2	12	_	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1900	1881	1881	1900	1881	1881	1881	1881	1881	1881
Adj Flow Rate, veh/h	1	1005	205	537	821	89	147	211	0	242	353	32
Adj No. of Lanes	_	2	0	_	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, %	_	_	_	_	_	_	_	_	_	_	_	_
Cap, veh/h	243	899	183	475	1965	213	145	615	947	304	398	338
Arrive On Green	0.30	0.30	0.30	0.27	0.60	0.60	0.08	0.33	0.00	0.21	0.21	0.21
Sat Flow, veh/h	617	2960	602	1792	3253	353	1792	1881	1599	1177	1881	1599
Grp Volume(v), veh/h	11	606	604	537	451	459	147	211	0	242	353	32
Grp Sat Flow(s),veh/h/ln	617	1787	1775	1792	1787	1819	1792	1881	1599	1177	1881	1599
Q Serve(g_s), s	1.6	39.5	39.5	34.5	17.4	17.4	10.5	<u>=</u>	0.0	26.5	23.7	2.1
Cycle Q Clear(g_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
Prop In Lane	1.00		0.34	1.00		0.19	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
V/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
Avail Cap(c_a), veh/h	243	543	539	475	1079	1098	145	615	947	304	398	33 33 80
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 Delay (d) skeh	33 1	45.00	AF 2	47.8	13.6	136	л о о	22.00	0.00	500	1.00	21.00
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
Initial Q Delay(d3),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
%ile BackOfQ(50%),veh/ln	0.3	30.7	30.7	27.8	8.9	9.0	8.4	5.8	0.0	9.8	14.6	0.9
LnGrp Delay(d),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
LnGrp LOS	С	F	F	F	В	В	F	С		Е	т	D
Approach Vol, veh/h		1221			1447			358			627	
Approach Delay, s/veh		119.8			57.4			76.8			66.7	
Approach LOS		F			ш			ш			П	
Timer	_	2	ယ	4	5	6	7	8				
Assigned Phs		2	ω	4	5	6		8				
Phs Duration (G+Y+Rc), s		47.0	39.0	44.0	15.0	32.0		83.0				
Change Period (Y+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_c+l1), 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		26.7				
Intersection Summary												
HCM 2010 Ctrl Delay			81.7									
HCM 2010 LOS			F S									

Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

HCM 2010 TWSC 28: Trosper Rd & Rural Rd

Projected 2040 No Build PM Peak Hour

BBL EBT WBT WBR SBL SBR 110 265 425 135 150 165 160	Minor Lane/Major Mvmt EBL Capacity (veh/h) 996 HcM Lane V/C Ratio 0.116	mt	Lane/Major Mvmt		0000		trol Delay, s	\pproach EB	Stage 2	Stage 1		Nov Cap-1 Maneuver 996	Platoon blocked, %	Stage 2		uver		Critical Hdwy Stg 2		4			low All	Major/Minor Major1	Avmt Flow 116	0	r Factor		storage, #		zed	Ţ.	#/hr	Future Vol. veh/h 11		Movement EBL	int Dolay, siveli	nt Delay shieh 0	ntersection
WBT WBR SBL 425 135 150 425 135 150 425 135 150 6 20 0 0 0 0 Free Free Slop Free Free Slop None 150 0 - 0 0 0 - 150 0 0 - 0 0 0 0 0 0 102 447 142 158 Major2 Minor2 447 142 158 518 518 - 0 1029 - 1029 - 1029 - 1029 - 1029 - 518 - 511 - 223 558 - 223 558 - 223 558 - 0 32.6 - 0 32.7 - 14.3	_	4 6	8	SL EI			.7	В		•		8		•		8	2		٠				9																
WBT WBR SBL 425 135 150 425 135 150 425 135 150 425 135 150 0 0 0 0 Free Free Slop None 150 0 0 0 0 0 0 0 0 95 95 95 1 1 1 2 447 142 158 Major2 Minor2 1029 1 1 1 2 1518 1516 1511 1525 1526 1527 158 1598 1		,	1	ST W					٠	•	٠	•	٠	1		•		•	•	•	٠		0		79	0	95	0	0		ne s	D D	0	55 5	5	Ψ			
WBR SBL 135 150 135 150 0 0 0 Free Stop None 150 - 0 0 - 0 0 - 0 0 - 150 - 150 - 150 - 102 142 158 - 142 158 - 511 - 6.42 - 5.42 - 6.42 - 7			٠	BT W																																			
WBR SBL 135 150 135 150 135 150 0 0 0 0 0 0 free Stop None 150 0 0 95 95 1 2 142 158 Minor2 1029 518 511 642 542 542 542 542 542 542 542	1	. 0	,	BR SB																																			
WBR SBL 135 150 135 150 135 150 0 0 0 0 0 0 free Stop None 150 0 0 95 95 1 2 142 158 Minor2 1029 518 511 642 542 542 542 542 542 542 542			223	Ln1 SE																				<u> </u>												_			
SBL SBL 150 150 0 0 Slop 150 0 95 2 158 518 511 6.42 5.43 5.41 6.42 5.42 5.42 5.42 5.42 5.42 5.42 5.43	14.3	317	558	3Ln2			0	WB						ï				,		,		,		ajor2	447	_	95	0	0				0	425					
														·									0		142	_	95				None	Free	0	135	125	WBR			
SBR 165 165 165 165 165 165 165 165 165 165					ę	D	32.6	SB	519	598	223	223		602	598	259	3.518	5.42	5.42	6.42	511	518	1029	Minor2	158	2	95	0	0	150	. 7	Ston	0	150	150	SBL			
												558				558	3.318			6.22			518		174	2	95			0	None	Ston	0	165	165	SBR			

Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

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

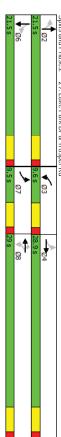
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Projected 2040 No Build
PM Peak Hour

		,	•	4				-	•		4	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	_#	*		J,	→	-4	J,	₩		JI.	₩	
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
Storage Lanes			_	_		_	_		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)		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+pt	NA		pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	7	4		ω	8			2			6	
Permitted Phases	4			000		000	2			6		
Detector Phase	/	4		cu	000	00	2	2		6	6	
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0			5.0	
Minimum Split (s)	9.5	26.5		9.5	26.5	26.5	21.5	21.5			21.5	
Total Split (s)	9.5	28.9		9.6	29.0	29.0	21.5	21.5			21.5	
Total Split (%)	15.8%	48.2%		16.0%	48.3%	48.3%	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	
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	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	Lag						
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes						
Recall Mode	None	None		None	None	None	Max	Max		Max	Max	
Intersection Summary												
Area Type:	Other											
Cycle Length: 60												
Actuated Cycle Length: 4	7.7											
Natural Cycle: 60												
Control Type: Actuated-Unicooldinated	Ilcooldillated											

Splits and Phases: 29: Lake Park Dr & Trosper Rd



Tumwater Transportation Master Plan SCJ Alliance

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

Projected 2040 No Build PM Peak Hour

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Novement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
ane Configurations	_#	⇟		_#	→	TA.	JI.	₽÷		_#	Þ,	
raffic Volume (veh/h)	10	415	S S S	65	540	155	75	88	70	160	25	15
Future volume (vervn)	7 10	4 15	1 3	بر در	240	18	лò	ی ق	10	1 00	62	16
nitial Q (Qb), veh	0 -	0 +	0 1	0	0	0 0	0	0 1	0 1	0 -	0	0 5
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1900	1881	1881	1881	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	⇉	437	58	86	568	163	79	32	74	168	26	16
Adj No. of Lanes	_	2	0	_	_	_	_		0	_	_	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
ercent Heavy Veh, %	_	_	_	_	_	_	0	0	0	0	0	0
Cap, veh/h	261	1102	146	468	740	629	575	169	390	513	364	224
Allive Oli Green	1703	0.33	0.35	1700	1001	1500	1304	0.33 E11	1101	1300	1100	670
Srn Volume(v) web/h	11	245	250	68	568	163	70	5	106	168	0 -	A)
Grp Sat Flow(s).veh/h/ln	1792	1787	1807	1792	1881	1599	1386	0 0	1692	1308	0 0	1780
) 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		0.70	1.00		0.38
ane Grp Cap(c), veh/h	261	621	628	468	740	629	575	0	559	513	0	588
//C Ratio(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
HCM Platoon Ratio	1.00	1.00	1.00	100	1,00	1.00	1,00	1.00	1.00	100	1.00	1.00
Jpstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Jniform 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
ncr Delay (d2), 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
nitial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	2.7	2.7	0.6	7.6	1.6	0.9	0.0	1.2	2.2	0.0	0.4
nGrp Delay(d),S/ven		3.1	3.	9.8	10.9	0.0	13.3	0.0	3.	0.8	0.0	
INGID LUS	α	2 0	σ	A	200	,	Œ	Ž	σ	a	2	٦
approach Vol, ven/n		506			150			3 8			210	
Approach LOS		B 13.1			B.0			13.2			D.8	
	,	,	,		,							
Imer	-	7	C.	4	5	0	/	œ				
Assigned Phs		2 2	ω	4		6	7	0 00				
PhS Duration (G+Y+RC), S		21.5	1.0	22.4		21.5	5.2	24.8				
nange Period (Y+RC), S		4.5	4.5	4.5		4.5	4.5	4.5				
Max Glear Time (G. G.11). S		7.0	ა <u>ე</u>	7 /		0.7	ى د د	15.5				
Green Ext Time (b. c). s		<u>۔</u> د د	0.0	7.0		1.0	0.0	4 5				
ntersection Summary												
HCM 2010 Ctrl Delay			14.4									
HCM 2010 LOS			В									

Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

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

Projected 2040 No Build
PM Peak Hour

Actuated Cycle Length: 130		Cycle Length: 130	rea Type:	tersection Summary	Recall Mode	ead-Lag Optimize?	ead/Lag	otal Lost Time (s)	ost Time Adjust (s)	\ll-Red Time (s)	'ellow Time (s)	otal Split (%)	otal Split (s)	Minimum Split (s)	finimum Initial (s)	witch Phase	etector Phase	ermitted Phases	rotected Phases	Turn Type	hared Lane Traffic (%)	leavy Vehicles (%)	eak Hour Factor	ravel Time (s)	ink Distance (ft)	ink Speed (mph)	Right Turn on Red	aper Length (ft)	torage Lanes	storage Length (ft)	deal Flow (vphpl)	uture Volume (vph)	raffic Volume (vph)	ane Configurations	ane Group	
Offset: 126 (97%), Referenced to phase 8:WBTL, Start of Red	Ö		Other		Max			4.6	0.0	1.0	3.6	27.4%	35.6	35.6	4.0		4		4	Split		1%	0.95					25	_	100	1900	85	85	J,	EBL	<u>,</u>
se 8:WBTI					Max			4.6	0.0	1.0	3.6	27.4%	35.6	35.6	4.0		4		4	NA		1%	0.95	14.8	652	30					1900	435	435	÷	EBT	Ļ
L, Start of																						1%	0.95				Yes		0	0	1900	175	175		EBR	1
Red					C-Max			4.6	0.0	1.0	3.6	25.8%	33.6	33.6	4.0		00		00	Split	38%	1%	0.95					25	_	150	1900	430	430	J	WBL	1
					C-Max			4.6	0.0	1.0	3.6	25.8%	33.6	33.6	4.0		œ		00	NA		1%	0.95	11.8	520	30					1900	365	365	\$÷	WBT	†
																						1%	0.95				Yes		0	0	1900	20	20		WBR	*
					Max	Yes	Lead	4.6	0.0	1.0		22.5%	29.2	24.5	4.0		5		5	Prot		1%	0.95					25	_	250	1900	325	325	J,	NBL	۶
					Max	Yes	Lead	4.6	0.0	1.0		32.7%	42.5	30.6	4.0		2		2			1%	0.95	20.4	896	30					1900	415	415	→	NBT	-
					C-Max			4.6	0.0	1.0	3.6	25.8%	33.6	33.6	4.0		œ	2	00	vo+md		1%	0.95				Yes		_	0	1900	475	475	74	NBR	*
					None	Yes	Lag	4.6	0.0	1.0			18.3	8.6	4.0		_		_	Prot		1%	0.95					25	2	150	1900	165	165	_7(SBL	•
					Max	Yes	Lag	4.6	0.0	1.0	3.6	24.3%	31.6	31.6	4.0		6		6	NA		1%	0.95	42.3	1861	30					1900	490	490	÷	SBT	←
																						1%	0.95				Yes		0	250	1900	110	110		SBR	*

Splits and Phases: 30: Littlerock Rd/2nd Ave & Trosper Rd

№	0 01	→ _{Ø4}	₹7 08 (R)	
42.5 s	18.3 s	35.6 s	33.6 s	
<u>→</u> Ø5				
29.2s 31.6s		_		

Tumwater Transportation Master Plan SCJ Alliance

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

Projected 2040 No Build PM Peak Hour

	-	ţ	1	1	†	1	۶	→	*	•	—	•
lovement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
ane Configurations	H	⇟		H	❖		_74	→	-1	H	→	
raffic Volume (veh/h)	85	435	175	430	365	20	325	415	475	165	490	110
-uture Volume (veh/h)	, 89	435	175	430	365	20	325	415	475	165	490	110
Number	7	4 0	14	ω	0 00	18	o 07	2	12	o _	0 6	16
nitial Q (Qb), ven	3 0	C	3 0	100	c	100	100	C	100	3 0	c	3 0
Parking Bus, Adi	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1900	1881	1881	1900	1881	1881	1881	1881	1881	1900
Adj Flow Rate, veh/h	89	458	121	286	618	21	342	437	379	174	516	116
Adj No. of Lanes	202	2	0	005	2	0	200	202	200	202	2	0000
Percent Heavy Veh %	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
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
at Flow, veh/h	1792	2803	735	1792	3618	123	1792	1881	1599	1792	2904	650
3rp Volume(v), veh/h	89	291	288	286	321	318	342	437	379	174	317	315
Grp Sat Flow(s),veh/h/ln	1792	1787	1751	1792	1881	1860	1792	1881	1599	1792	1787	1767
Jude O Clear(a.c.), s	5 0	19.2	19.5	17.8	19.5	19.5	24.6	27.9	19.6	12.5	22.2	22.4
Prop In Lane	1.00	i	0.42	1.00		0.07	1.00	!	1.00	1.00		0.37
ane Grp Cap(c), veh/h	427	426	418	400	420	415	339	548	823	189	371	367
//C Ratio(X)	0.21	0.68	0.69	0.72	0.77	0.77	1.01	0.80	0.46	0.92	0.85	0.86
wall Cap(c_a), veh/h	100	100	1 2 4 1 8	167	1 67	1 67	100	100	100	1 00	3/1	36/
lpstream Filter(I)	0.92	0.92	0.92	0.72	0.72	0.72	0.79	0.79	0.79	1.00	1.00	1.00
Iniform Delay (d), s/veh	39.7	45.0	45.1	37.3	37.8	37.8	52.7	42.5	20.1	57.6	49.6	49.7
ncr Delay (d2), 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
nitial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	10.5	10.4	9.6	11.2	11.1	16.5	15.9	13.0	0.5	13.1	13.2
nGrp LOS	D +0.7	D	D	D 43.0	D #/.	D	F 70.4	D	0.12	F 4	F	F 71.7
hproach Vol, veh/h		668			925			1158			806	
Approach Delay, s/veh		51.5			46.5			55.6			77.9	
\pproach LOS		D			D			Е			Е	
imer	_	2	ယ	4	5	6	7	8				
ssigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	18.3	42.5		35.6	29.2	31.6		33.6				
Change Period (Y+Rc), s	4.6	4.6		4.6	4.6	4.6		4.6				
Max Green Setting (Gmax), s	13.7	37.9		31.0	24.6	27.0		29.0				
1	0.0	29.9		27.5	26.6	24.4		21.5				
Max Q Clear Time (g_c+l1), s Green Ext Time (p_c), s												
<pre>Max Q Clear Time (g_c+l1), s Green Ext Time (p_c), s Intersection Summary</pre>												
Max Q Clear Time (g_c+11), s Green Ext Time (p_c), s Intersection Summary HCM 2010 Ctrl Delay			57.5									

Synchro 9 Report 6/10/2016

Tumwater Transportation Master Plan SCJ Alliance

Lanes, Volumes, Timings
31: Tyee Dr/l-5 SB Ramps & Trosper Rd

Projected 2040 No Build
PM Peak Hour

Spills and Phases: 31:	Intersection Summary Area Type: Other Cycle Length: 130 Actuated Cycle Length: 130 Offiset: 118 (91%), Referenced to phase 4:EBT and 8:WBT, Start of Red Natural Cycle: 110 Control Type: Actuated-Coordinated	Lead-Lag Optimize? Recall Mode	Lost Time Adjust (s) Total Lost Time (s)	All-Red Time (s)	Total Split (%)	Total Split (s)	Minimum Initial (s) Minimum Split (s)	Switch Phase	Detector Phase	Permitted Phases	Turn Type Protected Phases	Shared Lane Traffic (%)	Peak Hour Factor	Travel Time (s)	Link Distance (ff)	Right Turn on Red	Taper Length (ft)	Storage Lanes	Storage Length (ft)	Ideal Flow (vphpl)	Future Volume (vph)	Lane Configurations	Lane Group	
31: Tyee Dr/l-5 SB Ramps & Trosper Rd \$\hfrac{\phi}{D6}\$ 39 s	Other 30 nced to phas	Yes None	0.0 4.6	1.0	19.2%	25.0	4.0 8.6	;	7		Prot 7	1%	0.95				25	_	200	1900	205	20C	EBL	\
SB Ramp	se 4:EBT	Yes C-Max	0.0 4.6	1.0	31.5%	41.0	33.6		4		NA A	1%	0.95	11.8	520	3				1900	800	° 3	EBT	ļ
s & Trosp	and 8:WF	Yes C-Max	0.0 4.6	1.0	31.5%	41.0	33.6	;	4	4	Perm	1%	0.95			Yes		_	100	1900	25	ات ا	EBR	*
er Rd	3T, Start	Yes	0.0 4.6	1.0	21.5%	28.0	4.U 8.6	;	ω	c	Prot	1%	0.95				25	_	275	1900	275	ر ا د ا	WBL	•
28 s 28 s 28 (R)	of Red	Yes C-Max	0.0	1.0	33.8%	44.0	29.6	;	œ	c	» N	1%	0.95	20.1	883	3				1900	340	2 →	WBT	
												1 %	0.95			Yes		0	0	1900	400	3	WBR	,
		Max	0.0 4.6	1.0	16.9%	22.0	20.5	;	2	ı	Split	2%	0.95				25	_	75	1900	ယ ပ	ال ہ آ	NBL	ر
41 s		Max	0.0 4.6	1.0	16.9%	22.0	20.5	;	2	1	₂ NA	2%	0.95	18.9	83 2	3				1900	155	1 5 7	NBT	_
(R)									23	1	pt+ov	2%	0.95			Yes		_	125	1900	435	A 25	NBR	1
07 25s		Max	0.0 4.6	1.0	30.0%	39.0	36.6	,	6	c	Split	1%	0.95				25	_	400	1900	385	20 -7	SBL	4
		Max	0.0 4.6	1.0	30.0%	39.0	36.6	;	6	c	o NA	1%	0.95	21.6	95.5	3				1900	430	A30 →	SBT	*
		Max	0.0 4.6	1.0	30.0%	39.0	36.6		6	6	Perm	1%	0.95			Yes		_	400	1900	475	47E	SBR	4

Tumwater Transportation Master Plan SCJ Alliance

HCM 2010 Signalized Intersection Summary 31: Tyee Dr/l-5 SB Ramps & Trosper Rd

Projected 2040 No Build PM Peak Hour

Movement Lane Configurations Traffic Volume (veh/h) Future Volume (veh/h) Parking Bus, Adj Adj Flow, Rate, veh/h Adj Flow, Rate, veh/h Adj Flow, Rate, veh/h Adj Flow, Rate, veh/h Adj Flow, Packing Bus, Adj Adj Flow, Veh/h Adj Flow, Veh/h Fercent Heavy Veh, % Cap, veh/h Fercent Heavy Veh, % Fercent Heavy Veh, % Cap, veh/h Sat Flow, veh/h Cipy Sat Flow, Veh/h Cipy Sat Flow, Veh/h Sat Flow, Veh/h Cipy Sat F			٠	٠		٠		-	-	
Intigurations of time (veh/h) 205 colume (veh/h) 205 dolume (veh/h) 205 dolume (veh/h) 1.00 dolume (veh/h) 1.00 dolume (veh/h) 216 dolume (veh/h) 1792 dolume (veh/h) 1792 dolume (veh/h) 1792 dolume (veh/h) 216 dolume (veh/	1	4	1	1	٠	-	•	•	+	4
infigurations of the product of the	T EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
olume (veh/h) 205 olume (veh/h) 205 olume (veh/h) 205 olume (veh/h) 206 // (Ob), veh 1.00 s.Adj(A, pbT) 1.00 lour Factor 1.00 f Lanes 1 n Green 1.03 hay Veh, % 1 hay Veh, % 1 // (All A, pbT) 1.00 f Lanes 1.00 f Lanes 1.00 f Lanes 1.00 // (All A, pbT) 1.00 // (All A, pbT	↑	J,	44		_#	*	TA.	-71 -71	*	
Volume (veh/h) 205 (Ob), veh 0 a Adj(A, pbT) 1.00 Bus, Adj 1.00 Flow, veh/h/ln 1881 Flow, veh/h/ln 216 I Lanes 0.95 Leave 0.95 Heavy Veh, % 1 1 n Green 0.31 1, veh/h 1792 Flow(s), veh/ln 1792 (g_s), s 14.2 Clear(g_c), s 14.2 Lane 1.00 p Cap(c), veh/lh 281 Q(X) 281 Q(X) 2.00 m Filler(I) 0.65 Daelay (G), s/veh 8.2 Daelay (G), s/veh 8.2 Daelay (G), s/veh 8.2 Daelay (G), s/veh 50.6 CS D D D H Phs 50.6 CS D D 1.00 Period (Y+-Rc), s 1 Period (Y+-Rc), s 1 Period (Y+-Rc), s 1		275	340	400	35	155	435	385	430	475
(Ob), veh 0 adj(A, pbT) 1.00 Bus, Adj 1.00 Row, veh/hin 1881 Rate, veh/h 216 In Green 0.95 Heavy Veh, % 1 In Green 0.31 In Green 1.792 Imme(N), veh/h 1.792 (J_s), s 14.2 Ilane 1.00 p Cap(c), veh/h 211 O(X) p Cap(c), veh/h 281 O(X) Dolay (G), sveh 328 Dolay (G), sveh 42.5 Dolay (G), sveh 42.5 Dolay (G), sveh 82 Dolay (G), sveh 82 Dolay (G), sveh 90 So 00 So 00 So 00 So 00 J Phs LORO (Y+Rc), s 11 J Phs Brid (Y+Rc), s 11 J Phs J HPs All Phs All P	0 25	2/5	340	400	35	2 55	435	385	430	4/5
100 11,00 11,00 11,00 11,00 11,00 11,00 1 1 2,81 0,31 11,792 216 11,792 11,42		o ω	0 00	18	» (J	2	12	۰ -	0 0	16
1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00	130	300	c	300	300	С	300	30	o	3 0
1881 216 216 216 216 217 0.95 1 0.31 1792 216 217 226 1142 1142 1142 1142 1100 281 0.77 281 0.77 281 2.00 0.65 8.2 0.05 0.05	1.00	1.00	100	1.00	1.00	3	1.00	3 .	18	1.0
216 1 0.95 1 1 281 0.31 1792 216 11792 2142 142 142 142 142 10.07 281 0.77 281 2.00 0.65 42.5 8.2 0.65 0.76 0.76 0.77 0.76 0.77 0.76 0.77 0.76 0.77 0.77 0.77 0.78 0.77 0.78 0.77 0.78 0.77 0.78 0.77 0.78 0.77 0.78 0.77 0.78 0.77 0.78 0.77 0.78		1881	1881	1900	1863	1863	1863	1881	1881	1881
1 0.95 1 1 281 031 1792 2716 1792 2716 1792 2714.2 1.00 281 0.77 2		289	358	0	37	163	405	405	453	184
0.95 1 281 1792 216 1792 142 142 1142 1.00 281 0.77 281 2.00 0.65 42.5 8.2 0.0 7.6 50.6 D		_	2	0	_	_	_	2	_	
1 281 0.31 1792 114.2 11.00 281 0.77 281 2.00 0.65 42.5 8.2 0.0 7.6 D	5 0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
281 0.31 1792 216 11792 1142 1142 1142 1281 0.77 281 0.77 281 2.00 0.65 42.5 8.2 0.0 7.6 50.6 D		_	_	_	2	2	2	_	_	
0.31 1792 216 1792 1142 1142 1.00 281 0.77 281 2.00 0.65 42.5 8.2 0.0 7.6 50.6 D	0 456	313	1083	0	237	249	489	616	498	423
1792 216 1792 142 142 1.00 281 0.77 281 2.00 0.65 42.5 8.2 0.0 0.6 8.2 0.0		0.17	0.30	0.00	0.13	0.13	0.13	0.26	0.26	0.26
216 1792 14.2 14.2 1.00 2.81 0.77 2.81 2.00 0.65 42.5 8.2 0.0 7.6 D		1792	3668	0	1774	1863	1583	2329	1881	1599
1792 142 142 10.00 281 0.77 281 2.00 0.65 42.5 8.2 0.0 7.6 50.6 D		289	358	0	37	163	405	405	453	184
14.2 11.2 1.00 2.81 0.77 2.81 2.00 0.65 42.5 8.2 0.0 7.6 50.6	=	1792	1787	0	1774	1863	1583	1165	1881	1599
1.42 1.00 281 0.77 281 2.00 0.65 42.5 82 0.0 7.6 50.6 D		20.6	10.1	0.0	2.4	10.8	17.4	20.1	30.3	12.4
1.00 281 0.77 281 2.00 0.65 42.5 82 0.0 7.6 50.6 D		20.6	10.1	0.0	2.4	10.8	17.4	20.1	30.3	12.4
281 0.77 281 2.00 0.65 42.5 8.2 0.0 7.6 50.6	1.00	1.00		0.00	1.00		1.00	1.00		1.00
0.77 281 2.00 0.65 42.5 42.5 8.2 0.0 7.6 50.6	0 456	313	1083	0	237	249	489	616	498	423
281 2,00 0,65 42.5 82 00 7,6 50,6		0.92	0.33	0.00	0.16	0.65	0.83	0.66	0.91	0.43
2.00 0.65 42.5 8.2 0.0 7.6 D		322	1083	0	237	249	489	616	498	423
42.5 42.5 8.2 0.0 7.6 50.6 D		1.00	1.00	1.00	1.00	1.0	1.00	3.0	1.00	1.00
82 0.0 7.6 50.6 D	3 20.03	52.8	35.1	0.00	49.8	53.4	41 8	426	46.3	30.7
0.0 7.6 50.6 D		30.7	0.8	0.0	1.4	12.6	14.9	5.4	23.2	ω
7.6 50.6 D		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
50.6 D		12.9	5.1	0.0	1.3	6.4	15.5	6.9	18.9	5.9
1	4 20.3	83.5	35.9	0.0	51.2	66.1	56.7	48.0	69.5	43.0
_	CCC	Ŧ	D		D	Е	Е	D	Е	
	4		647			605			1042	
_			57.2			58.9			56.5	
_	2		ш			Е			Е	
	C 2	4	5	6	7	ω				
		4		6	7	∞				
		4		39.0	25.0	44.0				
		41.7		4.6	4.6	4.6				
x), s		41.7 4.6		34.4	20.4	39.4				
Max Q Clear Time (g_c+l1), s 19.4		41.7 4.6 36.4		32.3	2	12.1				
Green Ext Time (p_c), s 0.0		41.7 4.6 36.4 26.9			10.2	2 4				
ntersection Summary		41.7 4.6 36.4 26.9 4.2		1.2	2.3	1				
HCM 2010 Ctrl Delay		41.7 4.6 36.4 26.9 4.2		1.2	2.3	1				
HCM 2010 LOS		41.7 4.6 36.4 26.9 4.2		1.2	2.3	1				

SCJ Alliance	Tumwater Transportation Master Plan

Synchro 9 Report 6/10/2016

HCM 2010 TWSC 32: I-5 NB Ramps & Trosper Rd

Projected 2040 No Build PM Peak Hour

Maj F E	_	١									
FBL EBL EBL CHANGE FIRE		i									
Major Fire	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SEL	S
Majort Wajors Wajors Wajors With National Research Wajors	Traffic Vol, veh/h	0	1030	665	0	1015	410	0	145	0	
hr 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Future Vol, veh/h	0	1030	665	0	1015	410	0	145	0	
Free Free Free Free Free Free Free Free Slop Slop Slop	Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	
Free Free Free Yield Free Yield Free Yield Free Yield Free Free Free Yield Free	Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	S
300	RT Channelized			Free			Free		Yield		
gge. # . 0 . 0 . 0 . 0 . 0 0 0 0 0 0 0 0 0 0 0	Storage Length	300									
95 95 95 95 95 95 95 95 95 95 95 95 95 9	Veh in Median Storage, #		0			0		0		0	
95 95 95 95 95 95 95 95 95 95 95 95 96 10084 700 0 1068 432 0 153 Major1	Grade, %		0			0		0		0	
1 1 1 1 1 1 1 1 1 1	Peak Hour Factor	95	95	95	95	95	95	95	95	95	
Major1 Major2 Minor1 Major2 Minor1	Heavy Vehicles, %	_	_	_	_	_	_	_	_	0	
Flow All 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Mvmt Flow	0	1084	700	0	1068	432	0	153	0	
Flow All	Major/Minor	Major1			Major2			Minor1			
ge 1 ye 2 wy Sig 1	Conflicting Flow All		0				0		542		
pe 2	Stage 1					,					
wy Sig 1	Stage 2								1 ,		
WS 1g1	Critical Howy								1.12		
Hawy	Critical Hdwy Stg 7										
Maneuver 0 0 0 0 0 pg 1 0 0 0 0 0 0 pg 2 0 0 0 0 0 0 n Maneuver - - - - - - Maneuver - - - - - - - Maneuver - - - - - - - - - Maneuver -	Follow-up Hdwy								3.91		
ge 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Pot Cap-1 Maneuver	0	,	0	0	,	0	0	417		
pe 2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Stage 1	0		0	0		0	0	,		
CKed.	Stage 2	0		0	0		0	0			
Maneuver	Platoon blocked, %										
Maneuver	Mov Cap-1 Maneuver			·					417		
ge 2	Mov Cap-2 Maneuver	l.							,		
EB WB NB NB NB NB NB NB N	Stage 1										
rol Delay, s	Stage 2		١.			١.					
rol Delay, S 0 0 Included the second of	Approach	EB			WB			NB			
Major Mvmt NBLn1 EBT WBT	HCM Control Delay, s	0			0			18.5			
NBLn1 EBT WB 417 - 0.366 - 18.5 - C - 1	HCMLOS							c			
417 - 0.366 - 18.5 - C -	Minor Lane/Major Mvmt	NBLn1	EBT	WBT							
0.366 - 18.5 - C -	Capacity (veh/h)	417									
1	HCM Cartel Delay (c)	0.366									
	HCM Lang LOS	18.5									
	HCM 95th %tile O(veh)	16									

Tumwater Transportation Master Plan SCJ Alliance

Lanes, Volumes, Timings 33: Capitol Blvd & Trosper Rd

Projected 2040 No Build PM Peak Hour

	\	ţ	4	1	1	*	۶	→	*	•	←	•
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	J,	2,	74	_#	¥		J,	♣		_#	*	74
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	50		0	250		0	100		200
Storage Lanes	_		_	_		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)		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		2	00	00		2	2		6	6	
Permitted Phases			4									6
Detector Phase	4	4	2	00	00		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 Split (s)	20.0	20.0	20.0	20.0	20.0		20.0	20.0		20.0	20.0	20.0
Total Split (s)	27.0	27.0	49.0	21.0	21.0		49.0	49.0		33.0	33.0	33.0
Total Split (%)	20.8%	20.8%	37.7%	16.2%	16.2%		37.7%	37.7%		25.4%	25.4%	25.4%
Yellow Time (s)	ა .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 Optimize?												
Recall Mode	None	None	C-Min	None	None		C-Min	C-Min		Min	Min	Min
Intersection Summary												
	Other											
Jth: 130												
Actuated Cycle Length: 130	i-	T C										
Oilser, 0 (0%), Rene eliced to pridse z:NBTE, Stattor Green, Master Illiersection	o pridse z.	NDIL, SI	alt of Gle	eii, ividste	a IIIeise							
Control Type: Actuated-Coordinated	dinated											
	2	1	2									
Jolita di id i idasca. Jas. Gu	oc. Capitol Diva & Hooper Iva	x - 1030C					•			†		
Ø2 (R)			22 -	3 Ø6			₹ ₩04	94		21 €	80	
1			C				6/3			2		

Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

HCM 2010 Signalized Intersection Summary 33: Capitol Blvd & Trosper Rd

Projected 2040 No Build PM Peak Hour

Movement		EBT ↓	EBR 🗸	WBL	WBT	WBR /	NB 🅕	NBT →	NBR 🔪	SBL 🗸	◆	SB 🔌
Lane Configurations Traffic Volume (veh/h)	595	6; 2 ,	460	55 _#	250	50	690 _#	770 *	10	35 _#	985 \$	
Future Volume (veh/h)	595	65	460	50	250	50	690	770	10	35	985	
Number	7	4	14	ω	œ	18	5	2	12	_	6	
Initial Q (Qb), veh	1 8 0	0	100	1 8 0	0	3 0	100	0	1 8 0	100	0	
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/h/ln	1881	1881	1881	1900	1900	1900	1881	1881	1900	1881	1881	
Adj Flow Rate, veh/h	675	0	247	. 53	263		516	1105	, =	37	1037	
Adj No. 01 Lanes Peak Hour Factor	0 95	2 2 0	0 -	S _	0 95 -	3, c	0 -	0 95	3 9 0	0 -	0 %	
Percent Heavy Veh, %				0 0	0	0				3		
Cap, veh/h	634	0	836	237	201	40	620	1287	13	400	797	
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	
Sat Flow, veh/h	3583	0	1599	1810	1536	310	1792	3719	37	1792	3574	
Grp Volume(v), veh/h	675	0	247	53	0	316	516	559	557	37	1037	
Grp Sat Flow(s),veh/h/ln	1792	0	1599	1810	0	1845	1792	1881	1875	1792	1787	
Cycle Q Clear(q c), s	23.0	0.0	11.2	3 s 4	0.0	17.0	36.6	37.9	37.9	2.1	29.0	
Prop In Lane	1.00		1.00	1.00		0.17	1.00		0.02	1.00		
Lane Grp Cap(c), veh/h	634	000	836	237	000	241	620	651	649	400	797	
Avail Cap(c, a), veh/h	634	0.00	836	237	0.00	241	620	651	649	400	797	
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	
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.79	0.79	0.79	0.17	0.17	
Incr Delay (d2), s/veh	54.2	0.0	0.2	0.5	0.0	165.8	10.0	11.2	11.2	0.0	136.9	
nitial 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 BackOfQ(50%),veh/ln	16.1	0.0	8.6	1.7	0.0	19.8	19.9	21.8	21.7	1.1	29.4	
LnGrp Delay(d),s/veh	103.9	0.0	16.4	51.1	0.0	222.3	63.8	65.6	65.7	40.1	187.4	
Annroach Vol veh/h	-	922	,		260		r	1630	r	,	1074	
Approach Delay, s/veh		80.5			197.7			65.1			182.3	
Approach LOS		т			F			ш			т	
Timer		2	ယ	4	5	6	7	∞				
Assigned Phs		2		4		6		8				
Phs 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 U clear Time (g_c+II), 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 Ctrl Delay			112.4									
HCM Z010 LOS			7									
Notes												

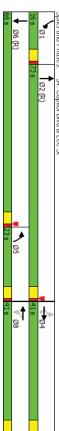
Tumwater Transportation Master Plan SCJ Alliance

Lanes, Volumes, Timings 34: Capitol Blvd & Lee St

Projected 2040 No Build PM Peak Hour

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		ž,	74	JI.	¥		J#	∳		J	∳	
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		
Storage Lanes	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)		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			00		5	2		_	6	
Permitted Phases	4		4	00								
Detector Phase	4	4	4	00	00		5	2		_	6	
Switch Phase												
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0		6.0	12.0		6.0	12.0	
Minimum Split (s)	29.0	29.0	29.0	30.0	30.0		11.0	25.0		11.0	25.0	
Total Split (s)	41.0	41.0	41.0	41.0	41.0		23.0	73.0		16.0	66.0	
Total Split (%)	31.5%	31.5%	31.5%	31.5%	31.5%		17.7%	56.2%		12.3%	50.8%	
Yellow Time (s)	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	
Lost Time Adjust (s)		0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		4.6	4.6	4.6	4.6		4.6	4.6		4.6	4.6	
Lead/Lag							Lag	Lag		Lead	Lead	
Lead-Lag Optimize?								Yes			Yes	
Recall Mode	None	None	None	None	None		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	ed to phas	e 2:NBT a	and 6:SB	T, Start of	Red							
Control Type: Actuated-Coordinated	rdinated											

Splits and Phases: 34: Capitol Blvd & Lee St



Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

HCM Signalized Intersection Capacity Analysis 34: Capitol Blvd & Lee St

Projected 2040 No Build
PM Peak Hour

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	•	↓	4	1	†	>	٠	→	*	•	-	•
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		ž,	-4	_#	❖		_3(≯		_#	⇒	
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	
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Fit		1.00	0.85	1.00	0.87		1.00	1.00		1.00	0.99	
Flt Protected		0.96	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1797	1599	1805	1646		1787	3565		1787	3528	
Flt Permitted		0.64	1.00	0.36	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		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	=	89	205	1221	21	74	1337	126
RTOR Reduction (vph)	0	0	69	0	67	0	0	<u>.</u>	0	0	5 5	0
Lane Group Flow (vpn)	1% 0	1%	1%	0% 0	⊋ 33	0% 0	1%	1%	<u>1</u> % c	1%	1%	1% 0
Turn Type	Perm	X.	Perm	Perm	NA NA		Prot	NA N		Prot	X.	
Protected Phases		4			8		5	2		_	6	
Permitted Phases	4		4	œ								
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	
Clearance Time (s)		4 6	4 6	2.6	4 6		0.10	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	
v/s Ratio Prot					0.02		c0.11	0.35		0.04	c0.41	
v/s Ratio Perm		c0.22	0.02	0.02								
v/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		3 .0		.00			13.00	1.00		1.43	0.3/	
Delay (s)		79.2	38.0	38.2	38.0		65.3	18.0		87.0	10.7	
Level of Service		П	D	D	D		П	В		Π	В	
Approach Delay (s)		68.0			38.1			24.7			14.3	
Approach LOS		Е			D			С			В	
Intersection Summary												
HCM 2000 Control Delay			25.2	Ŧ	CM 2000	HCM 2000 Level of Service	service		C			
HCM 2000 Volume to Capacity ratio	/ ratio		0.84)	2	:						
Actuated Cycle Length (s)			130.0	S	Sum of lost time (s)	time (s)			73.8			
Intersection Capacity Utilization	ם		82.0%	<u></u>	ICU Level of Service	f Service			D			
⊇			15									
c Critical Lane Group												

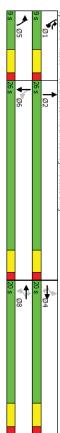
Tumwater Transportation Master Plan SCJ Alliance

Lanes, Volumes, Timings
35: Littlerock Rd & Fred Meyer/Costco Drwy

Projected 2040 No Build PM Peak Hour

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		2,	74		2,	74	J,	4		H	↑	
Traffic Volume (vph)	0	0	0	140	57	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	1900
Storage Length (ft)	0		0	0		0	100		0	175		0
Storage Lanes	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)		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+pt	NA	
Protected Phases		4			00	_	5	2		_	6	
Permitted Phases	4		4	00		00				6		
Detector Phase	4	4	4	00	00	_	5	2		_	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	
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	9.0	9.0	20.0		9.0	20.0	
Total Split (s)	20.0	20.0	20.0	20.0	20.0	9.0	9.0	26.0		9.0	26.0	
Total Split (%)	36.4%	36.4%	36.4%	36.4%	36.4%	16.4%	16.4%	47.3%		16.4%	47.3%	
Yellow Time (s)	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	
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)		4.0	4.0		4.0	4.0	4.0	4.0		4.0	4.0	
Lead/Lag						Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?						Yes	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	2											
Natural Cycle: 55	coordinated											
Control Type: Actuated-Uncoordinated	coordinated											

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



Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

HCM 2010 Signalized Intersection Summary 35: Littlerock Rd & Fred Meyer/Costco Drwy

	Projected
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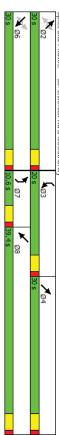
Lane Configurations Traffic Volume (veh/h) Future Volume (veh/h)	0 0	o o 4 ,	0074	140 140	ഗ ഗ 🕰	135 74	0 0 	1040 1040	105 105	105 	965 965	00
Number	7	4	14	w	00	18	с л (2	12	_ ;	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1881	1881	1881	1881	1900	1881	1881	1900
Adj Flow Rate, veh/h	0	0	0	147	ۍ ت	142	0	1095	. 11	111	1016	0
Adj No. of Lanes	0	i _		0	i _	-		2	0		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	_	_	_	_	_		_	_	_
Cap, veh/h Arrive On Green	000	291	247	372 0.15	0 15	379	0 00 4	1618	164 0 49	423 0.08	2385	900
Sat Flow. veh/h	0	1900	1615	1390	47	1599	1792	3278	332	1792	3668	0
Grp Volume(v), veh/h	0	0	0	152	0	142	0	597	609	111	1016	0
Grp Sat Flow(s),veh/h/ln	0	1900	1615	1437	0	1599	1792	1787	1823	1792	1787	0
Q Serve(g_s), s	0.0	0.0	0.0	4.5	0.0	3.3	0.0	11.3	11.3	<u>-1</u>	5.9	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	4.5	0.0	<u>ω</u>	0.0	11.3	11.3	<u></u>	5.9	0.0
Prop In Lane	0.00		1.00	0.97	,	1.00	1.00		0.18	1.00		0.00
Lane Grp Cap(c), ven/h	200	167	24/	3/9	200	3/9	2 4	288	900	423	2385	200
V/C Ratio(X)	0.00	0.00	0.00	0.40	0.00	700	0.00	0.68	0.68	0.26	0.43	0.00
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	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
Incr 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 BackOfQ(50%),veh/ln	0.0	0.0	0.0	1.8	0.0	1.5	0.0	6.5	6.6	0.6	3.0	0.0
LnGrp 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
LnGrp LOS				æ		σ.		σ.	æ	Þ	Þ	
Approach Vol, veh/h		0			294			1206			1127	
Approach Delay, s/veh		0.0			16.4			12.7			4.2	
Approach LOS					В			В			Þ	
Timer		2	ω	4	5	6	7	ω				
Assigned Phs	_	2		4	5	6		8				
Phs 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 (g_c+l1), s	ω.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 Ctrl Delay			9.5									
HCM 2010 LOS			Α									

Tumwater Transportation Master Plan SCJ Alliance

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

Projected 2040 No Build PM Peak Hour

Splits and Phases: 36: Littlerock Rd & Costco Drwy



Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

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

Projected 2040 No Build
PM Peak Hour

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Movement	SEL	SET	SER	NWL	TWN	NWR	NEL	NET	NER	SWL	SWT	SWF
Lane Configurations		2	٦,		2,	٦,	Ji,	∌		JI.	→	
Traffic Volume (vph)	100	33.	20	95	57 .	260	65	825	145	265	735	100
Future Volume (vph)	100	30	20	95	υī	260	65	825	145	265	735	100
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	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	0.98		1.00	0.98	
Flt Protected		0.96	1.00		0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1830	1615		1814	1615	1787	3494		1787	3510	
Flt Permitted		0.73	1.00		0.67	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1389	1615		1278	1615	1787	3494		1787	3510	
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)	105	32	21	100	5	274	68	868	153	279	774	105
RTOR Reduction (vph)	0	0	14	0	0	184	0	18	0	0	13	
Lane Group Flow (vph)	0	137	7	0	105	90	68	1003	0	279	866	
Heavy Venicles (%)	0%	0%	0%	0%	0%	0%	- %	1%	1%	- 1%	1%	_
Turn Type	Perm	NA	Perm	Perm	ع ک	Perm	Prot	NA		Prot	NA O	
Promitted Phases	٨	0	4	ى	7	ى	,	4		c	o	
Actuated Green G (s)	c	0.60	26.0	1	26.0	0.40	л	26.1		15.0	275 Q	
Effective Green, q (s)		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	0.07	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	
Vehicle Extension (s)		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	0.01		0.25	0.17	0.58	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		0	В		0	В	D	0		D	В	
Approach Delay (s)		21.0			19.9			33.0			23.2	
Approach LOS		С			В			C			C	
Intersection Summary												
HCM 2000 Control Delay HCM 2000 Volume to Canacity ratio	ratio		26.5	Ŧ	CM 2000	HCM 2000 Level of Service	service		C			
Actuated Cycle Length (s)			79.1	Sı	Sum of lost time (s)	time (s)			12.0			
Intersection Capacity Utilization	_		65.9%		ICU Level of Service	of Service			С			
Analysis Period (min)			15									
c Critical Lane Group												

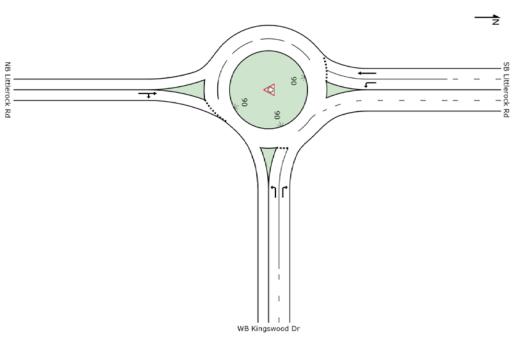
Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 2/17/2016

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♥ 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

Mov	OD	Demand Flows	Flows	Deg.		Level of	95% Back of Queue	f Queue	Prop.	Effective	Average
		Total		Satn	Delay				Queued	Stop Rate	Speed
		veh/h	%	v/c	sec		veh	ŧ		per veh	mp
South: N	South: NB Littlerock Rd	Rd									
00	1	895	1.0	1.009	22.0	LOSF	48.8	1229.0	1.00	0.81	29.2
18	R2	168	1.0	1.009	21.9	LOS F	48.8	1229.0	1.00	0.81	28.5
Approach	ä	1063	1.0	1.009	22.0	LOSC	48.8	1229.0	1.00	0.81	29.1
East W	East: WB Kingswood Dr	d Dr									
_	2	195	1.0	0.364	16.1	LOS B	3.0	75.4	0.99	0.93	31.7
16	R2	=======================================	1.0	0.067	4.2	LOS A	0.0	0.0	0.00	0.49	36.5
Approach	'n	305	1.0	0.364	11.8	LOSB	3.0	75.4	0.63	0.77	33.2
North: S	North: SB Littlerock Rd	Rd									
7	2	95	1.0	0.123	11.4	LOSB	0.7	17.4	0.48	0.66	33.7
4	1	837	1.0	0.684	5.7	LOS A	7.7	195.2	0.75	0.57	35.2
Approach	ä	932	1.0	0.684	6.3	LOS A	7.7	195.2	0.73	0.58	35.1
All Vehicles) Do	2300	1.0	1.009	14.3	LOSB	48.8	1229.0	0.84	0.71	31.8

Level of Service (LOS) Method: Delay & vic (HCM 2010).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay and vic ratio (degree of saturation) per movement LOS ratio (are the same that the sa

Roundabout Capacity Model: SIDRA Standard.

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

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

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

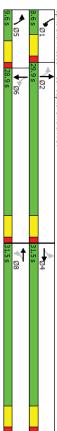
SIDRA INTERSECTION 6.1 | Copyright © 2000-2015 Alcolik and Associates Pty Ltd | sidrasolutions.com
Organisation: SCJ ALLIANCE | Processed: Wednesday, February 17, 2016 2:14:41 PM
Project NJ. Projects 10625 City of Turnwater 0625.17 Turnwater Transportation Master Plan/TrafficiOperations/sidra/2040 Baseline/Projected 2040 Baseline
PM.sip6

Lanes, Volumes, Timings 38: Capitol Blvd & X St

Projected 2040 No Build PM Peak Hour

Area Type: Other Cycle Length: 70 Actuated Cycle Length: 46 Natural Cycle: 75	Recall Mode None None None None None Max None Intersection Summary	Optimize? Yes Yes	Lead Lag L	4.5 4.5 4.5 4.5 4.5	t (s) 0.0 0.0 0.0 0.0 0.0 0.0) 1.0 1.0 1.0 1.0 1.0 1.0	s) 3.5 3.5 3.5 3.5 3.5) 45.0% 45.0% 45.0% 45.0% 13.7% 42.7%	31.5 31.5 31.5 9.6	315 315 315 315 05 355		4 4 8 8 5 2	4	hases 4 8 5 2	Turn Type Perm NA Perm NA pm+pt NA pm+pt	2(%)	8) 0% 0% 0% 0% 0% 1%	or 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95		30 30	d Yes Yes	ft) 25 25 25	1 0 1 0 1 0	t) 100 0 100 0 150 0	1900 1900 1900 1900 1900 1900 1900	30 1 20 35 1 20 25 1190 20) 30 1 20 35 1 20 25 1190 20	lurations 🐧 🖒 🐧 🎁	Lane Group EBL EBT EBR WBL WBT WBR NBL NBT NBR SBL	シレン ハイアク コマシ
	None	Yes	Lead	4.5	0.0	1.0	3.5	12.3%	86	9.5		_	6		pm+pt						Yes	25						J.		*
	Max	Yes	Lag	4.5	0.0	1.0	3.5	41.3%	28.9	7.0)	6		6	NA		1% 1%		31 1	30	Yes				1900 1900	1190 50		44	SBT SBR	4

splits and Phases: 38: Capitol Blvd & X St



Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

HCM 2010 Signalized Intersection Summary 38: Capitol Blvd & X St

Projected 2040 No Build PM Peak Hour

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	_#	ॐ		_#	ॐ		_#	∌		_3(⇒	
Traffic Volume (veh/h)	30		20	33	_	20	25	1190	20	35	1190	50
Number	7	4 -	14	ب د	ω <u>-</u>	18 20	J C	2	12	ا د	6 6	16
Initial Q (Qb), veh	0	0.	0	0	0	0 :	0	0 1	o i	0 -	0	0 :
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1881	1881	1900	1881	1881	1900
Adj Flow Rate, veh/h	32	_	21	37	_	21	26	1253	21	37	1253	53
Adj No. of Lanes		i _	0	·	:	0	i _	2	0	i _	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 ven, %	200	J C	157	200	J C	167) A -	2024	ر ا)) (3006	2
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	66	1792	3495	148
Grp Volume(v), veh/h	32	0	22	37	0	22	26	622	652	37	640	666
Grp Sat Flow(s),veh/h/ln	1412	0	1626	1412	0	1626	1792	1787	1871	1792	1787	1855
Q Serve(g_s), s	0.9	0.0	0.6	111	0.0	0.6	0.3	10.4	10.4	0.4	10.7	10.
Pron In Lane	100	0.0	0.0	1 00	0.0	0.0	100	0.4	0.03	100	10.7	0.08
Lane Grp Cap(c), veh/h	285	0	164	285	0	164	347	1011	1058	365	1025	1064
V/C 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
Avail Cap(c_a), veh/h	992	30	978	1 992	200	9/8	506	1011	1058	469	1025	1064
HCM Platoon Ratio	1.00	0.00	1.00	1 .	0.00	1 .	1 .0	1.00	1.00	1.00	3 .	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
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.
%ile BackOtQ(50%),ven/in	10.4	0.0	10 0	10.4	0.0	100	л O. T	o (J o &	6.0	5.2	6.0	0.2
LnGrp LOS	В		В	В		Б.	> i	D	D i	A	D i	
Approach Vol, veh/h		54			59			1300			1343	
Approach Delay, s/veh		19.1			19.1			9.2			9.1	
Approach LOS		В			В			Þ			Α	
Timer	_	2	ယ	4	ഗ	6	7	<u></u>				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.0	29.9		9.0	5.6	30.3		9.0				
Change Period (Y+Rc), 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				
Green Ext Time (g_c+11), s	0.0	11.3		0.5	2.3	10.3		0.7				
Intersection Summary												
HCM 2010 Ctrl Delay			9.5									
HCM 2010 LOS			Þ									

Tumwater Transportation Master Plan SCJ Alliance

HCM 2010 TWSC 39: Elm St & X St

Projected 2040 No Build PM Peak Hour

None Sip Slop Slop Slop Slop Slop Slop Slop Slo	Intersection Int Delay, siveh 2.3 Movement Traffic Vol, veh/h Future Vol, veh/h	m	EBT 15	10 10 10 10 10 10 10 10 10 10 10 10 10 1		WBL 5	WBT 5	WBR 5	NBL 5	NBT 90	NBR 10		SBL
Slop Slop Slop Slop Slop Free	Traffic Vol, veh/h Future Vol, veh/h Conflicting Peds, #/hr	0 0 0	0 15	0 10		0 5 5	0 5 5	0 5 5	0 5 5	0 % %			
	Sign Control RT Channelized	Stop -	Stop	Stop				Stop	Free	Free -	1 (0	Z 7	Free Fre
Minor2	Storage Length		٠, د								١ ٥		
95 95 95 95 95 95 95 95 95 95 95 95 95 9	ven in Wedian Storage, #		0 0				0 0				0		
Minor2 Minor1 Major1 Minor2 Minor1 Major1 182 182 66 190 179 100 68 66 66 - 111 111	Grade, % Peak Hour Factor	S .	у 9 0	95 .		9,	5 O	9,	95 -	_	й 0	ў 9	
Minor2	Heavy Vehicles, %	0 0	0	0 8		0	0	0	0		0		0
Minor2 Minor1 Ma 182 182 66 190 179 100 66 66 - 111 111 - 1 116 116 - 79 68 - 62 7.1 6.5 6.2 7.1 6.5 6.2 6.1 5.5 - 6.1 5.5 - 6.1 6.1 5.5 - 6.1 5.5 - 6.1 7.3 6.1 5.5 - 6.1 5.5 - 6.1 9.5 844 - 899 807 - 74 99.6 803 - 93.5 842 - 77 714 714 1003 751 716 961 1 90.7 4 714 1003 751 716 961 1 91.7 844 - 896 805 - 77 94.7 844 - 896 805 - 77 94.7 844 - 896 805 - 77 94.7 844 - 896 805 - 77 95.7 9.7 9.6 1486 - 77 1546 - 797 796 1486 77 1546 - 797 796 1486 77 1546 - 797 796 1486 77 1546 - 797 796 1486 77 1546 - 797 796 1486 77 1546 - 797 796 1486 77 1546 - 797 796 1486 77 1546 - 797 796 1486 797 796 1486 797 1546 - 797 796 1486 797 1546 - 797 796 1486 797 1546 - 797 796 1486 797 1546 - 797 796 1486 797 1547 - 796 1486 797 1548 - 797 796 1486 797 1549 - 797 796 1486 797 1540 - 797 796 1486 797 1541 - 797 796 1486 797 1542 - 797 796 1486 797 1543 - 797 796 1486 797 1544 - 797 796 1486 797 1545 - 797 796 1486 797 1546 - 797 796 1486 797 1547 - 797 796 1486 797 1548 - 797 796 1486 797 1549 - 797 796 1486 797 1540 - 797 796 1486 - 797 1540 - 797 796 1486 797 1540 - 797 796 1486 797 1540 - 797 796 1486 797 1540 - 797 796 1486 797 1540 - 797 796 1486 797 1540 - 797 797 1540 - 797 797 1540 - 797 797 1540 - 797 797 1540 - 797 797 1540 - 797 1540 - 797 1540 - 797 1540 - 797 1540 - 797 1540 - 797 1540 - 797 1540 -	Mvmt Flow	==	16	=		Ŋ	5	ហ	5		95		1
182 182 66 190 179 100 66 66 - 111 111 - 111 - 166 62 7.1 6.5 6.2 7.1 6.5 6.2 7.1 6.5 6.2 7.1 6.5 6.2 6.1 5.5 - 6.1 5.5 - 6.1 5.5 - 6.1 6.1 5.5 - 6.1 5.5 - 6.1 5.5 - 6.1 7.1 714 1003 774 718 961 1 7.1 714 1003 751 716 961 1 7.1 714 1003 751 716 9.1 7.1 714 1003 751 716 9.1 7.1 714 1003 751 716 9.1 7.1 714 1003 751 716 9.1 7.1 714 1003 751 716 9.1 7.1 714 1003 751 716 9.1 7.1 714 1003 751 716 9.1 7.1 714 1003 751 716 9.1 7.1 714 1003 751 716 9.1 7.1 714 1003 751 716 9.1 7.1 714 1003 751 716 9.1 881 801 751 751 76 9.6 7.1 704 805 805 - 751 76 9.6 7.2 9.6 7.3 0 - 797 796 1486 - 797 796 1486 7.3 0 - 9.7 7.6 0 9.6 7.3 0 - 9.7 7.6 0 0 9.6 7.3 0 - 9.7 7.6 0 0 9.6 7.3 0 - 9.7 7.9 0 0	Major/Minor	Minor2			M	linor1			Major1				Major2
116 116 . 79 68	Conflicting Flow All Stage 1	182	182	- 66		190	179	. 100	- 68		. 0	0 0	. 0
7.1 6.5 6.2 7.1 6.5 6.2 6.1 5.5 - 6.1 5.5 - 6.1 6.1 5.5 - 6.1 5.5 - 6.1 6.1 5.5 - 6.1 5.5 - 6.1 6.1 5.5 - 6.1 5.5 - 6.1 6.1 5.5 - 6.1 5.5 - 6.1 6.1 5.5 - 6.1 5.5 - 6.1 6.1 5.5 - 6.1 5.5 - 6.1 6.1 5.5 - 6.1 5.5 - 6.1 6.1 5.5 - 6.1 5.5 - 6.1 6.1 5.5 - 6.1 5.5 - 6.1 6.	Stage 2	116	116	,		79	66	,					
6.1 5.5 . 6.1 5.1 5.5 . 6.1 5.5 . 6.1 5.5 . 6.1 5.5 . 6.1 5.5 . 6.1 5.5 . 6.1 5.1 5.5 . 6.1 5.5 . 6.1 5.5 . 6.1 5.5 . 6.1 5.5 . 6.1 5.5 . 6.1 5.1 5.5 . 6.1 5.5 . 6.1 5.5 . 6.1 5.5 . 6.1 5.5 . 6.1 5.5 . 6.1 5.1 5.5 . 6.1 5.1 5.5 . 6.1 5.1 5.5 . 6.1 5.1 5.5 . 6.1 5.1 5.5 . 6.1 5.1 5.5 . 6.1 5.1 5.5 . 6.1 5.1 5.5 . 6.1 5.1 5.1 5.5 . 6.1 5.1 5.1 5.1 5.1 5.1 5.1 5.1 5.1 5.1 5	Critical Hdwy	7.1	6.5	6.2		7.1	6.5	6.2	4.1		i.		
3.5 4 3.3 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5	Critical Hdwy Stg 1	6.1	n 5.5			6.1	n 55		l.				
784 716 1003 774 718 961 1 950 844 . 899 807 . 807 894 803 . 935 842 . 7174 714 1003 751 716 961 1 774 714 1003 751 716 961 1 774 714 1003 751 716 . 716 . 7174 714 . 751 716 . 7175 716 . 7175 716 . 7175 7176 . 7175 7176 . 7175 7176 . 7175 7176 . 7175 7176 . 7175 7176 . 7175 7176 . 7175 7176 . 7175 7175 7175 7175 7175 7175 7175 71	Follow-up Hdwy	3.5	4	ယ		3.5	4	ယ	2.2				
950 844 . 899 807 . 894 803 . 935 842	Pot Cap-1 Maneuver	784	716	1003		774	718	961	1546				
T714 714 1003 751 716 961 7714 714 714 714 715 751 716 961 997 997 997 997 997 997 997 997 997 99	Stage 1 Stage 2	950 894	844			935	807						
## NBL NBT NBREBLnTWBLn1 SBL SBT SBR	Platoon blocked, %	1	1	2		4	1	2	1		1		
947 844 - 896 805 - 881 801 - 908 842 - 908 84	Mov Cap-1 Maneuver Mov Cap-2 Maneuver	774	714	- 1003		751	716	961	1540				
B81 801 - 908 842 - EB WB S 9,7 9,6 A A A 1. 0,046 0.02 B 0,003 - 0,04	Stage 1	947	844			896	805	,			1		
EB WB 9,7 9,6 A A A A A A A A A A A A A A A A A A A	Stage 2	881	801			908	842						
8 9.7 9.6 A NBT NBREBLINIVBLINI SBL SBT SBR 1546 - 797 796 1486 0.0003 - 0.046 0.02 0.003 0 - 9.7 9.6 0 A A A - A A A	Approach	EB				WB			NB				SB
A A A A A A A A A A A A A A A A A A A	HCM Control Delay, s	9.7				9.6			0.3				0
mt NBL NBT NBREBLnTWBLn1 SBL SBT S 1546 - 797 796 1486 - 0.003 - 0.046 0.02 - \$\begin{array}{cccccccccccccccccccccccccccccccccccc	HCM LOS	A				⊳							
1546 - 797 796 1486 - 0.003 - 0.046 0.02		NBL	NBT	NBR E	:BLn1W	BLn1	SBL	SBT	SBR				
5) 7.3 0 - 9.7 9.6 0 - A A A A A .	Capacity (veh/h)	1546			797	796	1486						
A A . A A A .	ICM Control Delay (s)	7.3	0		9.7	9.6	0						
	ICM Lane LOS	Α	Þ										

Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

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

Projected 2040 No Build
PM Peak Hour

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⊅	74		2 ,	74	JI.	44		JI.	44	
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
Storage Length (ft)	0		125	0		100	175		0	225		0
Storage Lanes	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)		834			700			1337			1300	
Travel Time (s)		19.0			15.9			30.4			29.5	
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 (%)												
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		4			00		5	2		_	6	
Permitted Phases	. 4		4.	000	,	000	1 2	,		6		
Delector Filase	4	4	4	c	c	c	c	7		-	c	
Minimum Initial (e)	7.0	7.0	7.0	70	7.0	70	л	20		7.0	α Ο	
Minimum Split (s)	33.5	33 5	33	33.5	33 5	33.5	9.5	27.5		11.5	27.5	
Total Split (s)	34.0	34.0	34.0	34.0	34.0	34.0	9.5	29.4		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%	
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	
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 Optimize?							Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None	None	None	Max		None	Max	
Intersection Summary												
Area Type:	Other											
Cycle Length: 75												
Actuated Cycle Length: 61.1												
Natural Cycle: 75												
Control Type: Actuated-Uncoordinated	oordinated											

Tumwater Transportation Master Plan SCJ Alliance

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34s 34s 34s

40: Capitol Blvd & Dennis St

HCM Signalized Intersection Capacity Analysis 40: Capitol Blvd & Dennis St

Projected 2040 No Build PM Peak Hour

Analysis Period (min) c Critical Lane Group	Intersection Capacity Utilization	Actuated Cycle Length (s)	HCM 2000 Volume to Capacity ratio	HCM 2000 Control Delay	Intersection Summary	Approach LOS	Approach Delay (s)	Level of Service	Delay (s)	Incremental Delay, d2	Progression Factor	Uniform Delay, d1	v/c Ratio	v/s Ratio Perm	v/s Ratio Prot	Lane Grp Cap (vph)	Vehicle Extension (s)	Clearance Time (s)	Actuated g/C Ratio	Effective Green, g (s)	Actuated Green, G (s)	Permitted Phases	Protected Phases	Turn Type	Heavy Vehicles (%)	Lane Group Flow (vph)	RTOR Reduction (vph)	Adi. Flow (vph)	Peak-hour factor, PHF	Satd. Flow (perm)	Flt Permitted	Satd. Flow (prot)	Elt Drotacted	Erit Otili. I actor	Lapo Litil Eactor	Tetal Loct time (c)	Future Volume (vph)	Traffic Volume (vph)	Lane Configurations	Movement	
	ilization	s)	apacity ratio	Y																		4		Perm	1%	0	0	237	0.95							1900	225	225		EBL	,
						С	28.5	С	30.0	8.7	1.00	21.4	0.76	c0.21		368	3.0	4.5	0.28	17.8	17.8		4	NA	1%	279	0	42	0.95	1337	0.71	1805	006	100	1 4:5	1900	40	40	ž,	EBT	ļ
15	66.1%	64.5	0.70	16.0				В	17.0	0.0	1.00	17.0	0.02	0.01		441	3.0	4.5	0.28	17.8	17.8	4		Perm	1%	10	27	37	0.95	1599	1.00	1599	100	0 - 0	3 4.5	1900	333	35	٦,	EBR	1
	=	(0		_																		00		Perm	0%	0	0	42	0.95							1900	40	40		WBL	4
	ICU Level of Service	Sum of lost time (s)		HCM 2000 Level of Service		В	17.6	В	18.0	0.2	1.00	17.8	0.18	0.05		386	3.0	4.5	0.28	17.8	17.8		∞	NA	0%	68	0	26	0.95	1402	0.74	1843	0.07	100	1 00 4.5	1900	25	25	ž,	WBT	†
	of Servic	t time (s)) Level of				В	17.2	0.0	1.00	17.1	0.05	0.01		445	3.0	4.5	0.28	17.8	17.8	00		Perm	0%	22	57	79	0.95	1615	1.00	1615	1 00	0.85	1 00	1900	75	75	٦,	WBR	~
	Ф			Service				В	10.3	0.4	1.00	10.0	0.13	0.06	0.00	160	3.0	4.5	0.47	30.2	30.2	2	5	pm+pt	1%	21	0	21	0.95	303	0.16	1787	0.05	100	100	1900	20	20	ı	NBL	٠
						В	14.6	В	14.7	1.6	1.00	13.1	0.59		0.27	1618	3.0	4.5	0.46	29.4	29.4		2	NA	1%	960	သ	921	0.95	3551	1.00	3551	100	0.73	0.4.0	1900	8/5	875	∌	NBT	→
	С	13.5		В																					1%	0	0	42	0.95							1900	40	40		NBR	•
								Þ	7.9	0.3	1.00	7.6	0.17	0.08	c0.01	280	3.0	4.5	0.56	36.2	36.2	6	_	pm+pt	1%	47	0	47	0.95	348	0.18	1787	0 - 0	1 .0	3 ::	1900	45	45	J,	SBL	•
						В	13.8	В	14.0	2.0	1.00	12.0	0.67		c0.33	1765	3.0	4.5	0.50	32.4	32.4		6	NA	1%	1175	10	1053	0.95	3515	1.00	3515	100	0.73	0.4.0	1900	1000	1000	∌	SBT	•
																									1%	0	0	132	0.95							1900	125	125		SBR	•

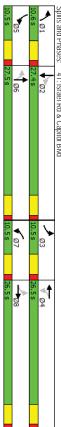
Tumwater Transportation Master Plan SCJ Alliance Synchro 9 Report 2/17/2016

Lanes, Volumes, Timings
41: Israel Rd & Capitol Blvd

Projected 2040 No Build
PM Peak Hour

Natural Cycle: 90 Control Type: Actuated-Uncoordinated	Actuated Cycle Length: 74.7	Cycle Length: 75	Area Type:	Intersection Summary	Recall Mode	Lead-Lag Optimize?	Lead/Lag	Total Lost Time (s)	Lost Time Adjust (s)	All-Red Time (s)	Yellow Time (s)	Total Split (%)	Total Split (s)	Minimum Split (s)	Minimum Initial (s)	Switch Phase	Detector Phase	Permitted Phases	Protected Phases	Turn Type	Shared Lane Traffic (%)	Heavy Vehicles (%)	Peak Hour Factor	Travel Time (s)	Link Distance (ft)	Link Speed (mph)	Right Turn on Red	Taper Length (ft)	Storage Lanes	Storage Length (ft)	Ideal Flow (vphpl)	Future Volume (vph)	Traffic Volume (vph)	Lane Configurations	Lane Group	
ated-Unc	ıgth: 74.7		_	ary		.2			_												(%)	_										ے	ح	S		
ordinatec			Other		None	Yes	Lead	4.5	0.0	1.0	3.5	14.0%	10.5	10.5	6.0		ω	00	ω	pm+pt		0%	0.95					25	_	0	1900	75	75	JI.	EBL	\
					None	Yes	Lag	4.5	0.0	1.0	3.5	35.3%	26.5	26.5	6.0		00		8	NA		0%	0.95	62.5	2751	30					1900	280	280	¥ [→]	EBT	ļ
																						0%	0.95				Yes		0	0	1900	215	215		EBR	4
					None	Yes	Lead	4.5	0.0	1.0	3.5	14.0%	10.5	10.5	6.0		7	4	7	pm+pt		2%	0.95					25	_	150	1900	140	140	J,	WBL	•
					None	Yes	Lag	4.5	0.0	1.0	3.5	35.3%	26.5	26.5	6.0		4		4	N		2%	0.95	16.5	725	30					1900	290	290	₽ [,]	WBT	†
																						2%	0.95				Yes		0	0	1900	205	205		WBR	<i>></i>
					None	Yes	Lead	4.5	0.0	1.0	3.5	14.1%	10.6	10.5	6.0		_	6	_	pm+pt		1%	0.95					25	_	150	1900	185	185	Ji,	NBL	۶
					Max	Yes	Lag	4.5	0.0	1.0	3.5	36.7%	27.5	26.5	6.0		6		6	NA		1%	0.95	21.2	934	30					1900	470	470	∌	NBT	→
																						1%	0.95				Yes		0	0	1900	40	40		NBR	•
					None	Yes	Lead	4.5	0.0	1.0	3.5	14.0%	10.5	10.5	6.0		5	2	5	pm+pt		1%	0.95					25	_	100	1900	135	135	H	SBL	•
					Max	Yes	Lag	4.5	0.0	1.0	3.5	36.5%	27.4	26.5	6.0		2		2	NA		1%	0.95	30.4	1337	30					1900	885	885	÷	SBT	←
																						1%	0.95				Yes		0	0	1900	100	100		SBR	•

41: Israel Rd & Capitol Blvd



Tumwater Transportation Master Plan SCJ Alliance

HCM 2010 Signalized Intersection Summary 41: Israel Rd & Capitol Blvd

Projected 2040 No Build PM Peak Hour

	\	ţ	4	4	4	1	J	-	7	*	+	4
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	_#	Þ,		JI.	¥ [→]		Ħ	44		_#	44	
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	ω	œ	18	7	4	14	_	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_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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
n/h/ln	1900	1900	1900	1863	1863	1900	1881	1881	1900	1881	1881	1900
	79	295	163	147	305	216	195	495	42	142	932	105
Adj No. of Lanes	_	_	0	_	_	0	_	2	0	_	2	0
_	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
ň, %	0	0	0	2	2	2	_	_	_	_	_	
Cap, veh/h	215	328	181	276	305	216	261	1051	89	405	1001	113
ireen	0.07	0.29	0.29	0.08	0.30	0.30	0.08	0.31	0.31	0.08	0.31	0.31
	1810	1151	636	1774	1016	720	1792	3336	282	1792	3239	365
Grp Volume(v), veh/h	79	0	458	147	0	521	195	265	272	142	514	523
ĥ.	1810	0	1788	1774	0	1736	1792	1787	1831	1792	1787	1817
	2.2	0.0	18.2	4.2	0.0	22.2	5.5	& &	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		0.41	1.00		0.15	1.00		0.20
p(c), veh/h	215	0	510	276	0	521	261	563	577	405	553	562
	0.37	0.00	0.90	0.53	0.00	1.00	0.75	0.47	0.47	0.35	0.93	0.93
'n	244	0	531	277	0	521	261	563	577	413	553	562
0	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	0.00) I OO	100	0.00	35.00	100	20.1	3	15.00	2.00	3.00
ber Delay (d.), siven	1 9.4	0.0	170	20.9	0.0	20.7	11.5	20.4	20.4	0.7	24.0	24.0
Initial O Delay(d3) s(veh	00 -:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%).veh/ln	12	0.0	11.4	2.2	0.0	16.2	ω :	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	С		D	С		Е	С	С	С	В	D	
Approach Vol, veh/h		537			668			732			1179	
Approach Delay, s/veh		40.0			55.5			25.1			45.2	
Approach LOS		D			ш			С			D	
Timer	_	2	ω	4	5	6	7	ω				
Assigned Phs	_	2	ω	4	5	6	7	∞				
Phs Duration (G+Y+Rc), s	10.6	27.4	9.3	26.7	10.2	27.8	10.4	25.6				
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	6.1	22.9	6.0	22.0	6.0	23.0	6.0	22.0				
Max Q Clear Time (g_c+l1), 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			41.8									
HCM 2010 LOS			D									

SCJ Alliance	Tumwater Transportation Master Plan

Synchro 9 Report 6/10/2016

> HCM 2010 TWSC 42: 66th Ave & Black Lake Belmore Rd

Projected 2040 No Build PM Peak Hour

Movement	Int Delay, Siven 6.1	_					
75 105 135 210 125 75 105 135 210 125 75 105 0 0 0 0 If Companies and the process of the proces	Vlovement	EBL	EBT	WBT	WBR	SBL	SBR
75 105 135 210 125 IT FICE Free Free Free Free Free Free Slop - None None None O O O O O O O O O O O O O O O O O O O	Traffic Vol, veh/h	75	105	135	210	125	140
Free Slop	uture Vol, veh/h	75	105	135	210	125	140
Free Free Free Free Stop - None - Non	Conflicting Peds, #/hr	0	0	0	0	0	0
. None . None None	Sign Control		Free	Free	Free	Stop	Stop
ge.#	RT Channelized		None		None		None
ge. # . 0 0 0 . 0 0 0 0 0 0 0 0 0 0 0 0 0	Storage Length					0	
National Process National Pr	Veh in Median Storage, #		0	0		0	
95 95 95 95 95 95 95 79 111 1 1 1 221 1 32	Grade, %		0	0		0	
Majori Major Major Major Minor 1 1 1 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Peak Hour Factor	95	95	95	95	95	95
Major Major Major Minor Major Minor M	Heavy Vehicles, %	_	_	_1	_	0	0
Major Major2 Minor2	/wmt Flow	79	111	142	221	132	147
Major! Major2 Minor2 363 0 - 0 521 363 0 - 253 258 4.111 - - 6.4 6.4 4.111 - - 5.4 5.4 2.209 - - 5.19 5.4 2.209 - - 5.19 794 - 1201 - - 782 - - - - 782 - - - - 483 - - - - 727 - - - - 727 - - - - - 727 - - - - - 727 - - - - - 727 - - - - - 727 - - - - - <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>							
363 0	Vlajor/Minor	Major1		Major2		Minor2	
## EBL EBT WBT WBR SBLn1 268	Conflicting Flow All	363	0		0	521	253
## 1201 - 6.4 Fig. 1	Stage 1					253	
4.11 - 6.4 2.209 - 5.4 2.209 - 3.5 1201 - 519 - 794 - 794 - 782 - 783 - 784 - 783 - 784 - 783 - 784 - 783 - 784 - 787 - 787 - 788 -	Stage 2					268	
Fr 1201	Critical Hdwy	4.11				6.4	6.2
Fr 1201	Critical Hdwy Stg 1					5.4	
2209	Critical Hdwy Stg 2					5.4	
1201	-ollow-up Hdwy	2.209				3.5	ω ω
The control of the co	ot Cap-1 Maneuver	1201				519	791
EB WB WB SBLn1 EBL EBT WB WB SSLn1 EBL CBT WB SSLn1 EBL CBT WB SSLn1 C C TOTAL COMMENT COMMENT C C TOTAL COMMENT C C TOTAL CAMPAN C C TOTAL C T	Stage 1					794	
### FBL EBI WBI WBR SBLn1 EB	Stage 2					782	
EB WB WB SBLn1 EBL EBI WB SBLn1 1201	Platoon blocked, %						
EB WB SB *** *** *** *** *** *** *** *** *** *	Mov Cap-1 Maneuver	1201				483	791
EB WB SB S 34 0 158 C C mt EBL EBT WBT WBR SBLn1 1201 608 0.006 0.459 5) 8.2 0 15.8 A A C	Nov Cap-2 Maneuver					483	
EB WB SB \$ 3.4 0 15.8 \$ 1201 608 0.006 0.459 8 2 0 15.8 A A A	Stage 1					794	
EB WB WB 3.4 0 mt EBL EBT WBT WBR SBLn1 1201 608 0.006 0,459 8.2 0 158 A A C	Stage 2					727	
EB WB \$ 3.4 0 mit EBL EBT WBT WBR SBLn1 1201 - 608 0.066 - 0.459 \$ 2 0 - 158 A A - C							
mit EBL EBT WBT WBRSBLn1 1201 608 0.066 0.459 s) 8.2 0 15.8 A A C	hpproach	EB		WB		SB	
mt EBL EBT WBT WBRSBLn1 1201 - 608 0.066 - 0.459 8.2 0 - 15.8 A A - C	HCM Control Delay, s	3.4		0		15.8	
mt EBL EBT WBT WBRSI 1201	1CM LOS					С	
1201 (0.066 (8.2 0 (A A	Ninor Lane/Major Mvmt	EBE		WBR SBLn1			
0.066 (8.2 0 (A A	Capacity (veh/h)	1201		- 608			
8.2 0 A A	ICM Lane V/C Ratio	0.066		- 0.459			
Α Α		8.2		- 15.8			
	HCM Control Delay (s)			ר			

Tumwater Transportation Master Plan SCJ Alliance

HCM 2010 TWSC 43: Kirsop Rd & 66th Ave

Projected 2040 No Build PM Peak Hour

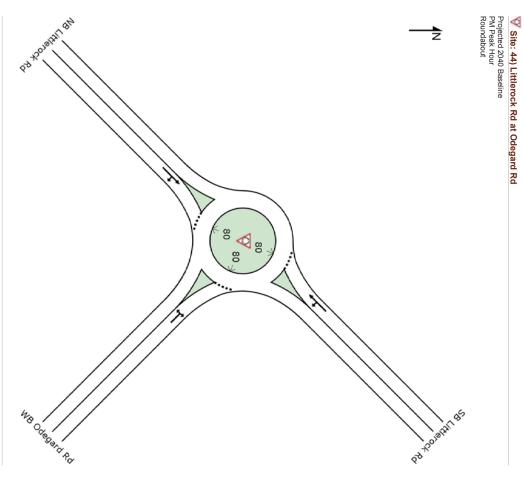
Intersection												
Int Delay, s/veh 9.2	2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	40	5	205	5	2	5	340	15	5	5	15	85
Future Vol, veh/h	40	5	205	5	2	5	340	5	5	5	15	85
Conflicting Peds, #/hr	0	0	0	0	0	0	0		0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized		í	None		None	None		ì	None			None
Storage Length						,		,			,	
Veh in Median Storage, #	í	0	ï		0	i		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
Mvmt Flow	42	5	216	5	2	5	358	16	5	5	16	89
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	809	808	61	916	850	18	105	0	0	21	0	0
Ctoro 1	7,	1,1		NCT NCT	101							

Major/Minor	Minor2			Minor1			M.	Major1			Major2		
Conflicting Flow All	809	808	61	916	850	18		105	0	0	21	0	0
Stage 1	71	71		734	734			·					į.
Stage 2	738	737		182	116								
Critical Hdwy	7.11	6.51	6.21	7.1	6.5	6.2		4.11		·	4.1	·	,
Critical Hdwy Stg 1	6.11	5.51		6.1	5.5	,						·	
Critical Hdwy Stg 2	6.11	5.51		6.1	5.5			·		·		·	,
Follow-up Hdwy	3.509	4.009	3.309	3.5	4	ა ა	2	2.209			2.2		,
Pot Cap-1 Maneuver	300	316	1007	255	300	1066		1493		·	1608	·	,
Stage 1	941	838		415	429								
Stage 2	411	426		824	803	ï		í		·			í
Platoon blocked, %												,	,
Mov Cap-1 Maneuver	240	238	1007	160	226	1066		1493		·	1608		,
Mov Cap-2 Maneuver	240	238		160	226							,	,
Stage 1	712	835		314	325			·		·		·	,
Stage 2	308	322		641	801								
Approach	EB			WB				NB			SB		
HCM Control Delay, s	14.5			19.1				7.7			0.3		
HCM LOS	В			C									
Minor Lane/Major Mvmt	NBL	NBT	NBR EBLn1WBLn1	1WBLn1	SBL	SBT	SBR						
Capacity (veh/h)	1493		- 639	9 268	1608								
HCM Lane V/C Ratio	0.24		- 0.41	0.412 0.047	0.003								
HCM Control Delay (s)	8.2	0	- 14.5	5 19.1	7.2	0							
HCM Lane LOS	A	Ð		ВС	Þ	A	,						
HCM 95th %tile Q(veh)	0.9			2 0.1	0								

Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

SITE LAYOUT



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₩ Site: 44) Littlerock Rd at Odegard Rd

Projected 2040 Baseline PM Peak Hour Roundabout

Movem	Movement Performance - Vehicles	nance - Vel	nicles								
Mov	OD	Demand Flows	Flows	Deg.	Average	Level of	95% Back of Queue	f Queue	Prop.	Effective	Average
ō		Total		Satn			Vehicles	Distance	Queued	Stop Rate	
		Vervi	%	V/C	Sec	ı	ven		ı	per ven	II pi
SouthEa	SouthEast: WB Odegard Rd	ard Rd									
3x	L2	26	0.0	0.082	18.7	LOS B	0.5	12.5	0.85	0.84	31.0
18x	R2	⇉	0.0	0.082	13.4	LOSB	0.5	12.5	0.85	0.84	30.3
Approach	¥	37	0.0	0.082	17.2	LOSB	0.5	12.5	0.85	0.84	30.8
NorthEa	NorthEast: SB Littlerock Rd	ock Rd									
×	L2	⇉	1.0	0.829	10.2	LOS B	19.5	491.0	0.57	0.38	35.5
6x	11	995	1.0	0.829	4.9	LOSA	19.5	491.0	0.57	0.38	35.6
Approach	ř	1005	1.0	0.829	4.9	LOSA	19.5	491.0	0.57	0.38	35.6
SouthW	SouthWest: NB Littlerock Rd	rock Rd									
2x	7	1026	1.0	0.832	4.5	LOSA	20.5	517.5	0.35	0.36	36.3
12x	R2	σı	1.0	0.832	4.4	LOSA	20.5	517.5	0.35	0.36	35.4
Approach	ň	1032	1.0	0.832	4.5	LOSA	20.5	517.5	0.35	0.36	36.3
All Vehicles	cles	2074	1.0	0.832	4.9	LOSA	20.5	517.5	0.47	0.38	35.9
25	level of Service (LOS) Method: Delay & v/c (HOM 2010)	Method: De	Nov 8. v/o) DOM 2010							

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

Roundabout LOS Method: Same as Signalised Intersections.

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 M3D).

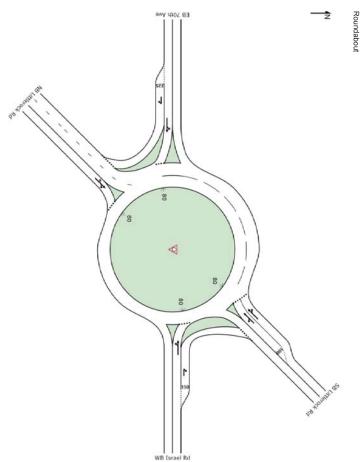
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation

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PM.sip6

SITE LAYOUT

W Site: 45) Littlerock Rd at Israel Rd

Projected 2040 Baseline PM Peak Hour Roundabout



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PM.sip6

W Site: 45) Littlerock Rd at Israel Rd

Projected 2040 Baseline PM Peak Hour Roundabout

Movem	Movement Performance - Vehicles	nance - Ve	nicles								
ōŞ	Mov C	Demand Flows Total HV	VH Swol	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles Distan	r Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
										per veh	
East: WI	East: WB Israel Rd										
à	7	116	1.0	0.581	17.9	LOS B	5.9	148.5	1.00	1.06	31.6
6	71	247	1.0	0.581	13.7	LOS B	5.9	148.5	1.00	1.06	31.8
16b	R3	447	1.0	0.504	8.3	LOSA	4.3	108.2	0.83	0.84	33.9
Approach	ä	811	1.0	0.581	11.3	LOSB	5.9	148.5	0.91	0.94	32.9
NorthEa	NorthEast: SB Littlerock Rd	ck Rd									
1bx	L3	232	1.0	0.684	21.0	LOSC	7.7	193.8	0.95	1.10	31.1
6x	71	647	1.0	0.684	13.9	LOS B	8.2	205.5	0.96	1.08	32.0
16ax	R1	179	1.0	0.684	12.8	LOS B	8.2	205.5	0.96	1.06	32.5
Approach	ä	1058	1.0	0.684	15.2	LOSB	8.2	205.5	0.96	1.08	31.9
West El	West EB 70th Ave										
5a	ニ	132	1.0	0.415	12.4	LOS B	2.4	59.3	0.79	0.89	33.6
2	71	132	1.0	0.415	8.4	LOSA	2.4	59.3	0.79	0.89	34.0
12b	R3	121	1.0	0.159	6.3	LOSA	0.7	18.2	0.62	0.78	35.0
Approach	'n	384	1.0	0.415	9.1	LOSA	2.4	59.3	0.73	0.86	34.1
SouthW	SouthWest: NB Littlerock Rd	ock Rd									
5bx	L3	289	1.0	1.055	63.4	LOSF	39.7	1001.2	1.00	2.01	19.8
2x	7	426	1.0	1.055	57.0	LOSF	39.7	1001.2	1.00	2.01	19.7
12ax	<u>R</u>	100	1.0	1.055	56.7	LOSF	39.7	1001.2	1.00	2.01	19.6
Approach	ř	816	1.0	1.055	59.2	LOSE	39.7	1001.2	1.00	2.01	19.7
All Vehicles	des	3068	1.0	1.055	25.1	LOSC	39.7	1001.2	0.93	1.26	27.7

Level of Service (LOS) Method: Delay & vic (HOM 2010).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay and vic ratio (degree of saturation) per movement

LOS F will result if vic > 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 (vic not used as specified in HOM 2010).

Roundabout Capacity Model: SIDRA Standard.

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

Gap-Acceptance Capacity: SIDRA Standard (Akçelik 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 2040 No Build PM Peak Hour

	,	ļ	1	1	Ť	>	۶	→	*	•	-	4
Lane Group	EBL	EBT	EBR .	WBL .	WBT	WBR	NBL .	NBT .	NBR .	SBL	SBT	SBR
Lane Configurations	J,	₽		J,	₹		JI.	₹		J,	₽	
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 (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	200		0	150		0	100		0
Storage Lanes			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)		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+pt	NA		pm+pt	NA		pm+pt	N		pm+pt	NA	
Protected Phases	7	4		ω	00		5	2		_	6	
Permitted Phases	4			00			2			6		
Detector Phase	7	4		ω	00		5	2		_	6	
Switch Phase												
Minimum Initial (s)	4.0	5.0		4.0	5.0		4.0	6.0		4.0	6.0	
Minimum Split (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 Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Max		None	Max	
Intersection Summary												
Area Type:	Other											
Cycle Longth: 40												

Cycle Length: 60
Actualed Cycle Length: 58.3
Natural Cycle: 70
Control Type: Actualed-Uncoordinated

Splits and Phases: 46: Linderson Way & Israel Rd

05 ₩<u>ø</u>6 07 (1)

SCJ Alliance Tumwater Transportation Master Plan

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

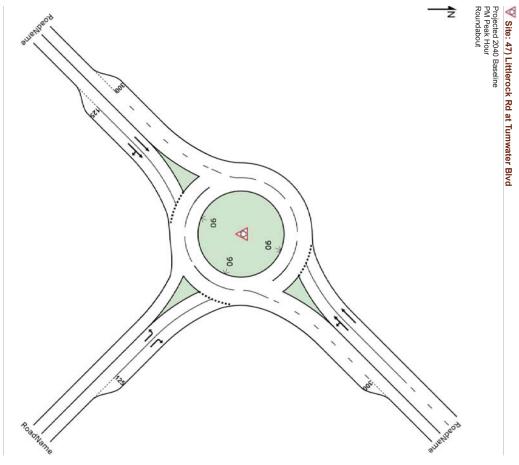
Projected 2040 No Build PM Peak Hour

						•	Ŀ	•	,	-	_	
	1	ţ	1	1	1	1	و	_	•	*	+	*
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	H	Ŧ,		J1	₽÷		J1	₽÷		_#	₽÷	
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	ω	00	18	5	2	12	_	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	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	g	2 -1	200	2 -	2 -1	000	2 -	2 -	000	2 -	2 -1	000
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	8 _		i _	; <u> </u>	2	2	2
Cap, veh/h	22/	366	115	254	521	0.28	400	560	2 43	395	251	251
Sat Flow, veh/h	1792	1374	431	1792	1770	94	1792	1726	132	1792	864	864
Grp Volume(v), veh/h	74	0	553	142	0	515	211	0	295	42	0	294
Grp Sat Flow(s),veh/h/ln	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	,	0.07	1.00	,	0.50
Lane Grp Cap(c), veh/h	227	0	481	254	0	549	400	0	603	395	0	501
V/C Ratio(X)	0.33	0.00	1.15	0.56	0.00	5.40	0.53	0.00	603	0.1	0.00	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(I)	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
% ile BackOfO(50%) web/in	0.0	0.0	10.0	1 7	0.0	10.0	2 0	0.0	<u> </u>	0 0	0.0	4 0
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	В		F	В		D	В		В	В		C
Approach Vol, veh/h		627			657			506			336	
Approach Delay, s/veh		99.7			38.9			18.2			22.1	
Approach LOS		TI			D			В			С	
Timer		2	ω	4	5	6	7	00				
Assigned Phs	_	2	ω	4	5	6	7	∞				
Phs Duration (G+Y+Rc), s	6.5	24.0	9.0	20.5	8.6	21.9	7.3	22.2				
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 (g_c+l1), s	3.0	9.6	5.4	18.0	6.1	10.7	3.8	18.2				
Green Ext Time (p_c), s	0.0	2.3	0.0	0.0	0.0	2.0	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			49.2									
HCM 2010 LOS			D									

Tumwater Transportation Master Plan SCJ Alliance

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SITE LAYOUT



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W Site: 47) Littlerock Rd at Tumwater Blvd

Projected 2040 Baseline PM Peak Hour Roundabout

Moveme	Movement Performance - Vehicles	ance - Ver	icles								
Mov	OD	Demand Flows	=lows	Deg.	Average	Level of	95% Back of Queue	Queue	Prop.	Effective	Average
				Sath					Queued	Stop Rate	Speed
										per veh	mph
SouthEas	SouthEast: RoadName	(v									
3x	L2	416	1.0	0.396	11.3	LOS B	2.5	62.2	0.54	0.72	33.7
18x	R2	400	1.0	0.390	5.8	LOSA	2.4	60.5	0.54	0.63	35.2
Approach	_	816	1.0	0.396	8.6	LOSA	2.5	62.2	0.54	0.68	34.4
NorthEas	NorthEast: RoadName										
×	L2	426	1.0	0.640	14.1	LOS B	6.0	150.6	0.77	0.87	33.5
6x	7	511	1.0	0.640	7.7	LOSA	6.0	150.6	0.69	0.75	34.7
Approach	,	937	1.0	0.640	10.6	LOSB	6.0	150.6	0.73	0.80	34.1
SouthWe	SouthWest RoadName	е									
2x	7	295	0.0	0.314	6.4	LOSA	1.9	47.9	0.62	0.59	35.6
12x	R2	232	0.0	0.268	6.4	LOSA	1.5	38.5	0.60	0.69	35.1
Approach	7	526	0.0	0.314	6.4	LOSA	1.9	47.9	0.61	0.64	35.4
All Vehicles	es	2279	0.8	0.640	8.9	LOSA	6.0	150.6	0.63	0.72	34.5
of S	Level of Service (LOS) Method: Delay & v/c (HOM 2010)	Method: De	lav & v/c	(HCM 2010)							

Level of Service (LOS) Method: Delay & vc (HCM 2010).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay and vicratio (degree of saturation) per movement LOS F will result if vic > 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 (vic 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 M3D).

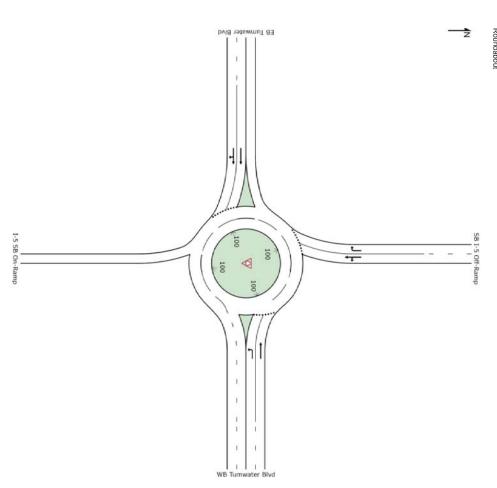
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation

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SITE LAYOUT

W Site: 48) Tumwater Blvd at I-5 SB Ramps

Projected 2040 Baseline Roundabout



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Ramps.s\p6

♥ Site: 48) Tumwater Blvd at I-5 SB Ramps

Projected 2040 Baseline Roundabout

Movement Performance - Vehicles	Performa	nce - Veh	icles								
>	OD	Demand Flows	lows	Deg.	Average	Level of	95% Back of Queue	Queue	Prop.	Effective	Average
ō	Mov	Total veh/h	% <	Satn v/c	Delay sec		Vehicles veh	Distance ft	Queued	Stop Rate per veh	Speed mph
East: WB Tumwater Blvd	ımwater Blv	ď									
_	L2	363	2.0	0.243	4.4	LOSA	0.0	0.0	0.00	0.00	28.0
6 Т	7	563	2.0	0.315	4.5	LOSA	0.0	0.0	0.00	0.00	26.0
Approach		926	2.0	0.315	4.5	LOSA	0.0	0.0	0.00	0.00	26.8
North: SB I-5 Off-Ramp	5 Off-Ramp										
7 L	[2	405	2.0	0.568	13.5	LOS B	3.4	87.4	0.71	0.80	24.6
4 T1		32	2.0	0.568	13.5	LOS B	3.4	87.4	0.71	0.80	27.1
14	R2	542	2.0	0.600	12.8	LOS B	4.0	101.0	0.72	0.81	24.6
Approach		979	2.0	0.600	13.1	LOSB	4.0	101.0	0.71	0.81	24.7
West EB Tumwater Blvd	ımwater Blv	a.									
2 1		753	2.0	0.988	37.4	LOS D	26.8	681.7	0.96	1.64	18.2
12 F	22	363	2.0	0.988	54.4	LOS D	26.8	681.7	1.00	2.17	17.0
Approach		1116	2.0	0.988	42.9	LOS D	26.8	681.7	0.98	1.81	17.8
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 & vic (HCM 2010).

Roundabout LOS Method: Same as Signalised intersections.

Vehicle movement LOS values are based on average delay and vic ratio (degree of saturation) per movement LOS to with a sare based on average delay value (does not apply for approaches and intersection).

LOS F will result if vic > 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 (vic not used as specified in HCM 2010).

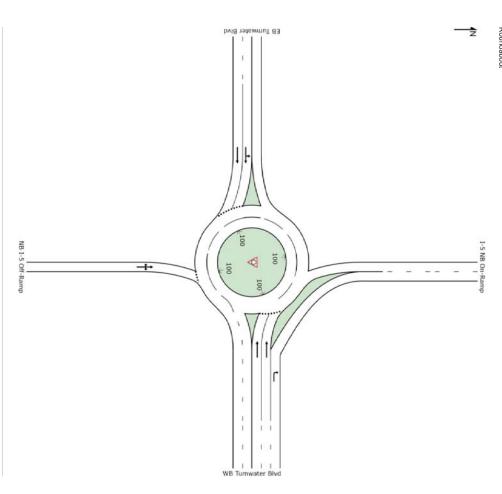
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
HCMS Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
HCMS Delay Formula option is used. Capacity SIDRA Standard (Axçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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SITE LAYOUT

W Site: 49) Tumwater Blvd at I-5 NB Ramps

Projected 2040 Baseline Roundabout



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♥ Site: 49) Tumwater Blvd at I-5 NB Ramps

Projected 2040 Baseline Roundabout

Mov	OD	Demand Flows	Flows	Deg.	Average	Level of	95% Back of Queue	Queue	Prop.	Effective	Average
				Satn	Delay				Queued		Speed
										per veh	mph
South: N	South: NB I-5 Off-Ramp	mp									
ω	L2	182	2.0	0.571	15.6	LOS B	3.4	86.8	0.75	0.86	24.5
8	⇉	σı	2.0	0.571	15.6	LOSB	3.4	86.8	0.75	0.86	27.0
18	R2	182	2.0	0.571	15.6	LOSB	3.4	86.8	0.75	0.86	23.4
Approach	5	369	2.0	0.571	15.6	LOS B	3.4	86.8	0.75	0.86	24.0
East: WI	East: WB Tumwater Blvd	Blvd									
6	ユ	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	LOSA	0.0	0.0	0.00	0.00	25.0
Approach	ä	1838	2.0	0.671	5.3	LOSA	7.3	185.2	0.34	0.36	24.0
West E	West EB Tumwater Blvd	Blvd									
5	L2	394	2.0	0.294	5.0	LOSA	0.0	0.0	0.00	0.00	28.1
2	⇉	747	2.0	0.420	5.7	LOSA	0.0	0.0	0.00	0.00	26.1
Approach	ä	1141	2.0	0.420	5.5	LOSA	0.0	0.0	0.00	0.00	26.7
All Vehicles	les	3348	2.0	0.671	6.5	LOSA	7.3	185.2	0.27	0.29	24.9

Level of Service (LOS) Method: Delay & vic (HCM 2010).

Roundabout LOS Method: Same as Signalised intersections.

Vehicle movement LOS values are based on average delay and vic ratio (degree of saturation) per movement LOS to with a sare based on average delay and vic ratio (degree of saturation) per movement LOS F will result if vic > 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 (vic 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.
HCMS Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
HCMS Capachy SIDRA Standard (Axçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

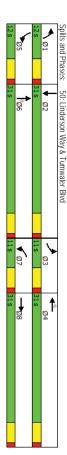
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Ramps.s/p6

Lanes, Volumes, Timings
50: Linderson Way & Tumwater Blvd

Projected 2040 No Build PM Peak Hour

Area Type:	Intersection Summary	Recall Mode	Lead-Lag Optimize?	Lead/Lag	Total Lost Time (s)	Lost Time Adjust (s)	All-Red Time (s)	Yellow Time (s)	Total Split (%)	Total Split (s)	Minimum Split (s)	Minimum Initial (s)	Switch Phase	Detector Phase	Permitted Phases	Protected Phases	Turn Type	Shared Lane Traffic (%	Heavy Vehicles (%)	Peak Hour Factor	Travel Time (s)	Link Distance (ft)	Link Speed (mph)	Right Turn on Red	Taper Length (ft)	Storage Lanes	Storage Length (ft)	Ideal Flow (vphpl)	Future Volume (vph)	Traffic Volume (vph)	Lane Configurations	Lane Group	
Other		None	Yes	Lead	5.0	0.0	1.0	4.0	12.9%	11.0	11.0	6.0		ω		ω	Prot	ల	2%	0.95					25	2	300	1900	90	90	7	EBL	,
		Max	Yes	Lag	5.0	0.0	1.0	4.0	36.5%	31.0	31.0	6.0		00		00	NA		2%	0.95	20.3	895	30					1900	655	655	≱	EBT	ţ
																			2%	0.95				Yes		0	0	1900	245	245		EBR	1
		None	Yes	Lead	5.0	0.0	1.0	4.0	12.9%	11.0	11.0	6.0		7		7	Prot		1%	0.95					25	_	350	1900	130	130	_#	WBL	4
		Max	Yes	Lag	5.0	0.0	1.0	4.0	36.5%	31.0	31.0	6.0		4		4	NA		1%	0.95	29.0	1275	30					1900	805	805	\$	WBT	1
		Max	Yes	Lag	5.0	0.0	1.0	4.0	36.5%	31.0	31.0	6.0		4	4		Perm		1%	0.95				Yes		_	250	1900	30	30	-4	WBR	1
		None	Yes	Lead	5.0	0.0	1.0	4.0	14.1%	12.0	11.0	6.0		_		_	Prot		1%	0.95					25	_	250	1900	175	175	_#	NBL	۶
		None	Yes	Lag	5.0	0.0	1.0	4.0	36.5%	31.0	31.0	6.0		6		6	NA		1%	0.95	23.1	1018	30					1900	135	135	→	NBT	→
		None	Yes	Lag	5.0	0.0	1.0	4.0	36.5%	31.0	31.0	6.0		6	6		Perm		1%	0.95				Yes		_	150	1900	75	75	74	NBR	•
		None	Yes	Lead	5.0	0.0	1.0	4.0	14.1%	12.0	11.0	6.0		5		5	Prot		1%	0.95					25	_	300	1900	210	210	_#	SBL	•
		None	Yes	Lag	5.0	0.0	1.0	4.0	36.5%	31.0	31.0	6.0		2		2	NA		1%	0.95	47.1	2073	30					1900	235	235	→	SBT	+
															Free		Free		1%	0.95				Yes		_	700	1900	790	790	74	SBR	*

Area Type: Ciner
Cycle Length: 85
Actuated Cycle Length: 74
Natural Cycle: 85
Control Type: Actuated-Uncoordinated



SCJ Alliance Tumwater Transportation Master Plan

HCM 2010 Signalized Intersection Summary 50: Linderson Way & Tumwater Blvd

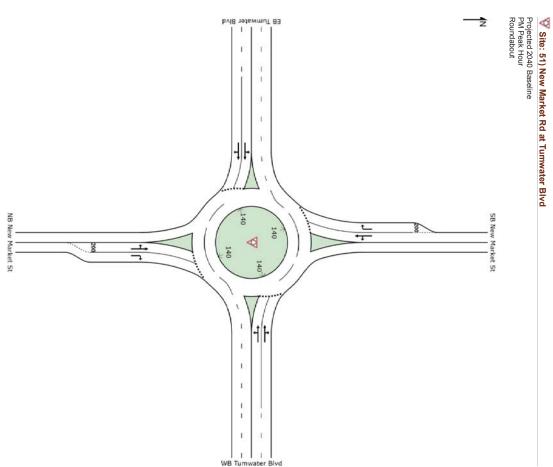
Projected 2040 No Build PM Peak Hour

	-	ţ	1	1	†	1	۶	→	¥	•	←	•
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	<u>-7</u> -31	↑		JI.	\$	74	JI.	→	٦,	J,	→	-4
Traffic Volume (veh/h)	9	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	ω	00	18	7	4	14	_	6	16	57	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	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	0	_	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, %	2	2	2	_	_	_	_	_	_	_	_	_
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
	3442	2522	944	1792	3574	1599	1792	1881	1599	1792	1881	1599
Grp Volume(v), veh/h	95	484	463	137	847	32	184	142	79	221	247	0
Grp Sat Flow(s), veh/h/ln	1721	1770	1696	1792	1787	1599	1792	1881	1599	1792	1881	1599
Q Serve(g_s), 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_c), 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
Lane Grp Cap(c), veh/h	244	638	611	149	1333	596	174	342	291	174	342	291
V/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_a), 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(I)	200	1.00	3.0	1.00	1.00	1.00	1.00	2.00	2.00	33.00	27.00	0.00
Uniform Delay (d), s/ven	32.0	20.3	20.3	32.8	0.0	14.5	32.6	26.1	25.4	32.6	27.8	0.0
Initial O Delay(d3) s(veh	0 .	0.0	0.0	00.0	0.0	0.0	04.5	0.0	0.0	0.0	0.0	0.0
%ile BackOfO(50%) veh/ln	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	С	С	С	F	С	В	F	С	С	F	С	
Approach Vol, veh/h		1042			1016			405			468	
Approach Delay, s/veh		29.1			29.1			67.7			106.7	
Approach LOS		С			С			ш			П	
Timer	_	2	ယ	4	5	6	7	00				
Assigned Phs	_	2	ω	4	5	6	7	∞				
Phs Duration (G+Y+Rc), s	12.0	18.1	10.1	ಬ	12.0	18.1	11.0	31.0				
Change Period (Y+Rc), s	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 (g_c+l1), 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			46.8									
HCM 2010 LOS			D									

Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

SITE LAYOUT



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Site: 51) New Market Rd at Tumwater Blvd

Projected 2040 Baseline PM Peak Hour Roundabout

Moveme Mov ID South: NB 3 8 18 Approach	Movement Performance - Vehicles Mov DD Demand Flows Mov Total HV ID Mov Total HV South: NB New Market St % 5 0.0 3 L2 26 0.0 8 T1 5 0.0 18 R2 68 0.0 Approach 100 0.0 East: WB Turmwater Blvd 0.0 0.0	nance - Vehicles Demand Flows Total HV veh/h % et St 0.0 68 0.0 100 0.0	Flows HV %	Deg. Sam v/c 0.055 0.085	Average Delay sec 13.9 6.8 6.2	LOS B LOS A LOS A	95% Back of Queue Vehicles Distan veh 0.2 0.2 0.4 0.4	ت ت	Distance ft 5.4 9.4 9.4	Ustance Queued ft 0.65 5.4 0.65 9.4 0.65 9.4 0.65	P Qu
18	공 그 [0.00	0.0	0.055	6.2 6.2 6.2	LOSA		0.2		9 5 6	5.4 0.65 9.4 0.65
Approac East: W	Approach East: WB Tumwater Blvd		0.0	0.085	8.2	LOS			0.4	0.4 9.4	0.4 9.4 0.65
_	[2	68	2.0	0.335	11.0	LOS B	Φ.	В 2.3		2.3	2.3 57.4
6	7	784	2.0	0.335	3.8	LOSA	⊳	A 2.3		2.3	2.3 58.6
16	R 2	63	2.0	0.335	4.2	LOSA	⊳	A 2.3		2.3	2.3 58.6
Approach	ch	916	2.0	0.335	4.4	LOSA	Þ	§A 2.3		2.3	2.3 58.6
North: S	North: SB New Market St	et St									
7	L2	126	4.0	0.215	13.4	LOS	Φ	B 0.9	В	B 0.9	B 0.9 22.7
4	7	26	4.0	0.215	6.3	LOSA	≻	A 0.9		0.9	0.9 22.7
14	R2	232	4.0	0.262	6.1	LOSA	Þ	A 1.1		1.1	1.1 29.7
Approach	sh	384	4.0	0.262	8.5	LOSA	A	SA 1.1		1.1	1.1 29.7
West E	West: EB Tumwater Blvd	Blvd									
O	L2	95	4.0	0.420	11.8	LOS B	₩	В 3.0		3.0	3.0 77.5
Ν	7	911	4.0	0.420	4.5	LOSA	Þ		3.1	3.1 80.0	3.1 80.0 0.52
12 Approach	3 73	1037	4.0	0.420	5 4.8	LOSA		3 3.1		ယ ယ	3.1 80.0
All Vehicles	cles	2437	3.1	0.420	5.5	LOSA	1	3.1		3.1	3.1 80.0

Level of Service (LOS) Method: Delay & vic (HCM 2010).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay and vicratio (degree of saturation) per movement

LOS F will result if vic > 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 (vic not used as specified in HCM 2010).

Bevolation for Consein LOS values are based on average delay for all movements (vic 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 M3D).

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 2-4846 PM
Project: N/Projects10625 City of Turmwater0625.17 Turmwater Transportation Master Plan\traffic\(\text{Operations\)\sidra\(\text{Sidra}\)\(\text{Copyright}\) Baseline\(\text{Projects\}\)
PM.sip6

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

Projected 2040 No Build PM Peak Hour

Control Type: Actuated-Uncoordinated	Actuated Cycle Le	Cycle Length: 95	Area Type:	Intersection Summary	Recall Mode	Lead-Lag Optimize?	Lead/Lag	Total Lost Time (s)	Lost Time Adjust (s)	All-Red Time (s)	Yellow Time (s)	Total Split (%)	Total Split (s)	Minimum Split (s)	Minimum Initial (s)	Switch Phase	Detector Phase	Permitted Phases	Protected Phases	Turn Type	Shared Lane Traffic (%)	Heavy Vehicles (%)	Peak Hour Factor	Travel Time (s)	Link Distance (ft)	Link Speed (mph)	Right Turn on Red	Taper Length (ft)	Storage Lanes	Storage Length (ft)	Ideal Flow (vphpl)	Future Volume (vph)	Traffic Volume (vph)	Lane Configurations	Lane Group	
uated-Unc	ngth: 84.			nary		e?			s)												ic (%)	ی										Ď	ਣ	ns		
coordinated	ω		Other		None	Yes	Lead	5.0	0.0	1.0	4.0	11.6%	11.0	11.0	6.0		_		_	Prot		3%	0.95					25	_	250	1900	150	150	_H	SEL	Ĺ
					Max	Yes	Lag	5.0	0.0	1.0	4.0	35.8%	34.0	34.0	6.0		6		6	NA		3%	0.95	12.7	934	50					1900	980	980	‡	SET	×
								5.0						34.0	6.0		6	6		Perm		3%	0.95				Yes		_	0	1900	195	195	٦,	SER	*
								5.0				٠,		11.0	6.0		5		5	Prot		1%	0.95					25	2	200	1900	225	225	<u> </u>	NWL	5
					Max	Yes	Lag	5.0	0.0	1.0	4.0	35.8%	34.0	34.0	6.0		2		2	NA		1%	0.95	49.4	3620	50					1900	515	515	≯	TWN	×
																						1%	0.95				Yes		0	0	1900	20	20		NWR	~
					None	Yes	Lead	5.0	0.0	1.0	4.0	11.6%	11.0	11.0	6.0		7		7	Prot		1%	0.95					25	_	275	1900	175	175	_#	NEL	अ
					None	Yes	Lag	5.0	0.0	1.0	4.0	41.1%	39.0	39.0	6.0		4		4	NA		1%	0.95	54.6	2404	30					1900	350	350	→	NET	×
					None	Yes	Lag	5.0	0.0	1.0	4.0	41.1%	39.0	39.0	6.0		4	4		Perm		1%	0.95				Yes		_	0	1900	300	300	-4	NER	1
					None	Yes	Lead	5.0	0.0	1.0	4.0	11.6%	11.0	11.0	6.0		ω		ω	Prot		1%	0.95					25	_	200	1900	110	110	_#	SWL	<u></u>
					None	Yes	Lag	5.0	0.0	1.0	4.0	41.1%	39.0	39.0	6.0		00		00	NA		1%	0.95	39.3	1729	30					1900	345	345	ᢌ	SWT	×
																						1%	0.95				Yes		0	0	1900	20	20		SWR	₹

Splits and Phases: 52: Tumwater Blvd & Capitol Blvd

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SCJ Alliance Tumwater Transportation Master Plan

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

Projected 2040 No Build
PM Peak Hour

	Ĺ	K	*	ን	×	~	अ	×	١	*	×	1
1ovement	SEL	SET	SER	NWL	TWN	NWR	NEL	NET	NER	SWL	SWT	SWR
ane Configurations	_#	\$	-14	_# _#	÷		_#	→	-14	_#	→	
raffic 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	_	6	16	5	2	12	7	4	14	ω	ω	18
nitial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1845	1881	1881	1900	1881	1881	1881	1881	1881	1900
Adj Flow Rate, veh/h	158	1032	131	237	542	21	184	368	90	116	363	21
ldj No. of Lanes	_	2	_	2	2	0	_	_	_	_	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, %	ω	ω	ω	_	_	_	_	_	_	_	_	_
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	0.26	0.07	0.26	0.26
	1757	3505	1568	3476	3509	136	1792	1881	1599	1792	3435	198
Grp Volume(v), veh/h	158	1032	131	237	276	287	184	368	90	116	188	196
√ln	1757	1752	1568	1738	1787	1857	1792	1881	1599	1792	1787	1846
	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		0.07	1.00		1.00	1.00		0.11
.ane Grp Cap(c), veh/h	128	1233	552	253	629	653	130	489	416	130	465	480
//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
\vail Cap(c_a), veh/h	128	1233	552	253	629	653	130	776	659	130	737	761
ICM 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
Jpstream Filter(I)	0.1	2.00	1.00	1.00	200	2.00	1.00	2.00	3.00	0.00	25.00	2.00
en	38.2	24.5	18.9	38.0	20.5	20.5	38.2	28.1	23.9	31.9	25.2	25.2
nitial O Dolay(d3) s/yoh	7.00	0.9	3 .	000	2.2	0.1	224.1	0.4	0.0	40.0	0.0	0.0
%ile BackOfO(50%) veh/ln	8 6	11 9	22	4 1	5 0	л с 4	11 1	80	16	<u>ه</u> ه	ω c	ى ص
	194.4	31.4	19.9	77.7	22.7	22.6	262.3	30.4	24.2	83.9	25.8	25.8
	П	C	В	т	C	C	'n	C	C	П	C	С
hproach Vol, veh/h		1321			800			642			500	
Approach Delay, s/veh		49.8			39.0			96.0			39.3	
Approach LOS		D			D			Ŧ			D	
imer	_	2	ω	4	5	6	7	σ				
Assigned Phs	_	2	ω	4	5	6	7	∞				
Phs Duration (G+Y+Rc), s	11.0	34.0	11.0	26.4	11.0	34.0	11.0	26.4				
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				
Vlax Q Clear Time (g_c+l1), s	8.0	11.8	7.3	16.8	7.6	24.3	8.0	9.2				
Green Ext Time (p_c), s	0.0	10.8	0.0	4.6	0.0	3.7	0.0	5.2				
ntersection Summary												
HCM 2010 Ctrl Delay			54.6									
HCM 2010 LOS			D									

Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

> Lanes, Volumes, Timings 53: 65th Ave & Henderson Blvd

Projected 2040 No Build
PM Peak Hour

Actuated Cycle Length: 71.9 Natural Cycle: 90 Control Type: Actuated-Uncoordinated	Cycle Length: 80	Area Type:	Intersection Summan	Recall Mode	Lead-Lag Optimize?	Lead/Lag	Total Lost Time (s)	Lost Time Adjust (s)	All-Red Time (s)	Yellow Time (s)	Total Split (%)	Total Split (s)	Minimum Split (s)	Minimum Initial (s)	Switch Phase	Detector Phase	Permitted Phases	Protected Phases	Turn Type	Shared Lane Traffic (%	Heavy Vehides (%)	Peak Hour Factor	Travel Time (s)	Link Distance (ft)	Link Speed (mph)	Right Turn on Red	Taper Length (ft)	Storage Lanes	Storage Length (ft)	Ideal Flow (vphpl)	Future Volume (vph)	Traffic Volume (vph)	Lane Configurations	Lane Group	
th: 71.9 ed-Uncoordinated	5	Other	У	Max			4.5	0.0	1.0	3.5	65.6%	52.5	27.5	8.0		2	2		Perm	_	1%	0.95					25	_	100	1900	10	10	J,	EBL	,
				Max			4.5	0.0	1.0	3.5	65.6%	52.5	27.5	8.0		2		2	NA		1%	0.95	48.0	2111	30					1900	900	900	₽÷	EBT	ļ
																					1%	0.95				Yes		0	0	1900	105	105		EBR	1
				Max			4.5	0.0	1.0	3.5	65.6%	52.5	27.5	8.0		6	6		Perm		1%	0.95					25	_	150	1900	120	120	_#	WBL	1
				Max			4.5	0.0	1.0	3.5	65.6%	52.5	27.5	8.0		6		6	NA		1%	0.95	40.0	1760	30					1900	645	645	₽÷	WBT	†
																					1%	0.95				Yes		0	0	1900	10	10		WBR	/
				None						3.5						œ	8		Perm		0%	0.95					25	0	0	1900	55	55		NBL	۶
				None			4.5	0.0	1.0	3.5	34.4%	27.5	12.5	8.0		00		œ	NA		0%	0.95	16.0	704	30					1900	0	0	₽	NBT	→
																					0%	0.95				Yes		0	0	1900	89	85		NBR	•
				None						3.5			27.5	8.0		4	4		Perm		0%	0.95					25	0	0	1900	10	10		SBL	•
				None			4.5	0.0	1.0	3.5	34.4%	27.5	27.5	8.0		4		4	NA		0%	0.95	8.0	354	30					1900	0	0	₽	SBT	←
																					0%	0.95				Yes		0	0	1900	5	51		SBR	•

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

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52.5 s	27.5 s
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52.5 s	

Tumwater Transportation Master Plan SCJ Alliance

HCM 2010 Signalized Intersection Summary 53: 65th Ave & Henderson Blvd

Projected 2040 No Build PM Peak Hour

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Movement	EBL	EBT	EBR .	WBL .	WBT	WBR	NBL .	NBT .	NBR .	SBL	SBT	SBR
Lane Configurations	×	₽>		J	₽÷			₽			₽	
Traffic Volume (veh/h)	10	900	105	120	645	10	55	0	85	10	0	Б
Future Volume (veh/h)	10	900	105	120	645	10	55	0	85	10	0	5
Number	5	2	12	_	6	16	ω	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_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1900	1881	1881	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	=	947	111	126	679	=	58	0	89	==	0	ъ
Adj No. of Lanes	_	_	0	_	_	0	0	_	0	0	_	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
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
Grp Volume(v), veh/h	=======================================	0	1058	126	0	690	147	0	0	16	0	0
Grp Sat Flow(s),veh/h/ln	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		0.61	0.69		0.31
Lane Grp Cap(c), veh/h	551	0	1358	315	0	1380	276	0	0	292	0	0
V/C Ratio(X)	0.02	0.00	0.78	0.40	0.00	0.50	0.53	0.00	0.00	0.05	0.00	0.00
Avail Cap(c_a), veh/h	551	0	1358	315	0	1380	623	0	0	610	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(I)	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	5.8	0.0	5.3	16.4	0.0	3.6	27.4	0.0	0.0	25.1	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.0	4.5	3. 8	0.0	1.3	1.9	0.0	0.0	0.1	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 BackOfQ(50%),veh/ln	0.1	0.0	13.1	2.1	0.0	5.5	2.7	0.0	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	Α		Α	С		Α	С			С		
Approach Vol, veh/h		1069			816			147			16	
Approach Delay, s/veh		9.8			7.3			29.3			25.2	
Approach LOS		Α			A			C			С	
Timer	_	2	ω	4	5 1	6	7	∞				
Assigned Phs		2		4		6		∞				
Phs Duration (G+Y+Rc), s		52.5		12.8		52.5		12.8				
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 Q Clear Time (g_c+I1), s		25.2		2.5		37.6		7.8				
Green Ext Time (p_c), s		17.9		1.0		9.1		0.9				
Intersection Summary												
HCM 2010 Ctrl Delay			10.3									
HCM 2010 LOS			Б 2									
LICINI ZOLO ECCO			c									

Synchro 9 Report 6/10/2016

Tumwater Transportation Master Plan SCJ Alliance

Lanes, Volumes, Timings
54: Henderson Blvd & Tumwater Blvd

Projected 2040 No Build PM Peak Hour

Tumwater Transportation Master Plan SCJ Alliance

Spilis and Phases: 54: Henderson Blvd & Tumwater Blvd

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HCM 2010 Signalized Intersection Summary 54: Henderson Blvd & Tumwater Blvd

Projected 2040 No Build PM Peak Hour

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Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations	*			Ž,	*	74		
Traffic Volume (veh/h)	755	57	30	180	300	375		
Future Volume (veh/h)	755	σı	30	180	300	375		
Number	σ ₁	12	ω	00	4	14		
Initial Q (Qb), 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, ven/n/in	188	1900	0061	1881	88	1881		
Adj Flow Rate, veh/h	795	э თ	32	189	316	279		
Auj No. 01 Laries	0,0	005	0,00	005 -	0 0 -	0 -		
Percent Heavy Veh, %	0 2	0 0		č				
Cap, veh/h	790	57	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		
Grp Volume(v), veh/h	801	0	221	0	316	279		
Grp Sat Flow(s), veh/h/ln	1790	0	1868	0	1881	1599		
Q Serve(g_s), s	40.0	0.0	10.5	0.0	12.9	л .Л 1		
Prop In Lane	0.99	0.01	0.14	0	į	1.00		
Lane Grp Cap(c), veh/h	796	0	249	0	543	1173		
V/C Ratio(X)	1.01	0.00	0.89	0.00	0.58	0.24		
Avail Cap(c_a), veh/h	196	200	249	200	543	1173		
HCM Platoon Ratio	1	000	1.0	0.00	100	1.00		
Uniform Delay (d), s/veh	25.0	0.0	38.3	0.0	27.3	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 BackOfQ(50%),veh/ln	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		ш		C	A		
Approach Vol, veh/h	801			221	595			
Approach Delay, s/veh	58.6			68.2	19.0			
Approach LOS	ш			Е	В			
Timer	_	2	ω	4	5	6	7	8
Assigned Phs		2		4				8
Phs Duration (G+Y+Rc), s		44.0		30.0				16.0
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+l1), s		42.0		14.9				12.5
Green Ext Time (p_c), s		0.0		2.6				0.0
Intersection Summary								
HCM 2010 Ctrl Delay			45.3					
HCM 2010 LOS			D					
Notes								

Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

> HCM 2010 TWSC 55: Henderson Blvd & Trails End Dr

Projected 2040 No Build PM Peak Hour

Movement	NWL	NWR	NET	T NER	SWL	SWT
raffic Vol, veh/h	80	55	170	-	110	210
uture Vol, veh/h	80	55	170		110	210
Conflicting Peds, #/hr	0	0			0	0
Sign Control	Stop	Stop	Free	Ţ	Free	Free
RT Channelized		None				None
Storage Length	0					
/eh in Median Storage, #	0			0 -		0
Grade, %	0					0
Peak Hour Factor	95	95	9		95	95
Heavy Vehicles, %	0	0			_	_
Nrmt Flow	84	58	179	_	116	221
//ajor/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 Stg 1	5.4					
Critical Hdwy Stg 2	5.4					
ollow-up Hdwy	3.5	3.3			2.209	
ot Cap-1 Maneuver	405	791			1239	
Stage 1	794					
Stage 2	645					
Platoon blocked, %						
Mov Cap-1 Maneuver	362	791			1239	
Vlov Cap-2 Maneuver	362					
Stage 1	794					·
Stage 2	576					
pproach	WW		NE	m	WS	
HCM Control Delay, s	16.1			0	2.8	
HCM LOS	C					
finor Lane/Major Mvmt	l_		MS			
Capacity (ver/h)		- 465				
Table Care		- 161	8.2 0			
ICM Control Delay (s)						
HCM Control Delay (s)						

Tumwater Transportation Master Plan SCJ Alliance

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

Projected 2040 No Build PM Peak Hour

Natural Cycle: 60	Actuated Cycle Length: 53.4	Cycle Length: 60	Aled Type. One	Intersection Summary	None None None	Lead-Lag Optimize? Yes		4.5 4.5 4.5) 0.0 0.0 0.0	1.0 1.0 1.0	s) 3.5 3.5 3.5	35.8% 35.8% 14.2%	21.5 21.5 8.5	21.5 21.5 8.5	al (s) 7.0	Switch Phase	Detector Phase 8 8 1		hases 8	Turn Type Prot Perm pm+pt	: (%)	0% 1%	ior 0.95 0.95 0.95	24.2	1065	30	d Yes	#	<u></u>) 200 0 175	1900 1900 1900	5 10 15	5 10 15	Lane Configurations	Lane Group SEL SER NEL 1	
					Max N						ω .5		38.5		7.0		6		6	NA			0.95								1900				NET	×
											3.5				7.0		2		2	NA		1%	0.95	90.2	3970	30					1900	535	535	→	SWT	×
					None	Yes	Lag	4.5	0.0	1.0	3.5	0.0%	30.0	27.5	7.0		2	2		Perm		1%	0.95				Yes		_	350	1900	70	70	-34	SWR	₹

Splits and Phases: 56: Littlerock Rd & Black Hills School Drwy



Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

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

Projected 2040 No Build PM Peak Hour

	Ĺ	*	y	×	×	₹	
Movement	SEL	SER	NEL	NET	TWS	SWR	
Lane Configurations	ĸ	-4	æ	→	→	-4	
Traffic Volume (veh/h)	σ.	10	15.	275	535	70	
Future Volume (veh/h)	, сл	10	, 15	275	535	3 70	
Number	- ω	0 18	o _	0 6	0 2	12	
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00		c	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	
Adj Sat Flow, veh/h/ln	1900	1900	1881	1881	1881	1881	
Adj Flow Rate, veh/h	υ	=	16	289	563	74	
Adj No. of Lanes	_	_	_	_	_	_	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	
Percent Heavy Veh, %	0	0	_	_	_	_	
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	
Grp Volume(v), veh/h	5 5	, 1 1	16	289	563	74	
O Serve(a s) s	01	03	01	19	1001	0.8	
Cycle Q Clear(q_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 Grp Cap(c), veh/h	51	46	590	1445	1224	1040	
V/C Ratio(X)	0.10	0.24	0.03	0.20	0.46	0.07	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	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	
inital Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
LnGrp Delay(d).s/veh	21.8	23.7	2.7	1.7	4.2	2.9	
LnGrp LOS	С	С	Α	Α	Α	Α	
Approach Vol, veh/h	16			305	637		
Approach Delay, s/veh	23.1			1.8	4.0		
Approach LOS	С			A	A		
Timer	_	2	3	4	5	6	7 8
Assigned Phs	_	2				6	8
Phs Duration (G+Y+Rc), s	5.2	33.3				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 U Clear Time (g_c+II), s	2.	0.0				3.9	2.3
Green Ext Time (p_c), s	0.0	6.4				8.0	0.0
Intersection Summary							
HCM 2010 Ctrl Delay			3.6				
HCM 2010 LOS			Þ				

Tumwater Transportation Master Plan SCJ Alliance

HCM 2010 TWSC 57: Center St & 76th Ave

Projected 2040 No Build PM Peak Hour

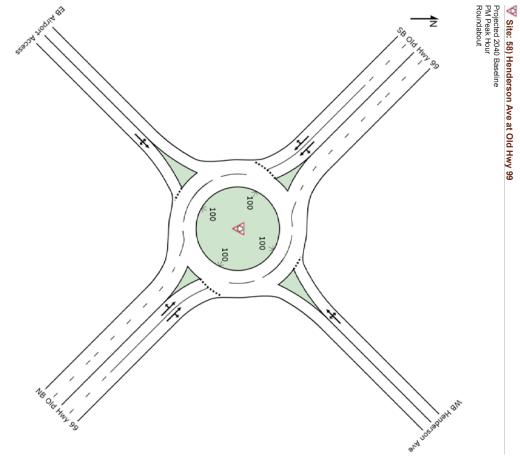
Intersection												
Int Delay, s/veh 4.3	<u></u>											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	85	15	2	15	15	35	2	300	0	15	425	165
Future Vol, veh/h	85	15	2	15	15	35	2	300	0	15	425	165
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop		Free	Free	Free	Free	Free	Free
RT Channelized		í	None		í	None		ì	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, %	ω	ω	ω	=	=	1	_	_	_	ω	w	ω
Mvmt 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	330		575	653							

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	ı							
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 Stg 1	6.13	5.53		6.21	5.61								
Critical Hdwy Stg 2	6.13	5.53		6.21	5.61	,			·			ï	
Follow-up Hdwy		4.027	3.327	3.599	3.599 4.099 3.399	3.399		2.209			2.227	•	•
Pot Cap-1 Maneuver	254	282	544	252	243	704		965	í		1239	í	
Stage 1	507	506		673	636							•	•
Stage 2	668	651		488	450	,		·	í			í	
Platoon blocked, %												,	
Mov Cap-1 Maneuver	224	276	544	236	237	704		965	·		1239	ï	
Mov Cap-2 Maneuver	224	276		236	237							•	•
Stage 1	505	496		671	634	,				٠			
Stage 2	615	649		461	441								
Approach	EB			WB				NB			SB		
HCM Control Delay, s	జ			17				0.1			0.2		
HCM LOS	D			C									
Minor Lane/Major Mumt	N.B.	NRT	NRD FR	NRD FRI n1WRI n1	SB	SBT	SBB						
Capacity (veh/h)	965			233 368	1239		,						
HCM Lane V/C Ratio	0.002		- 0.	0.461 0.186 0.013	0.013								
HCM Control Delay (s)	8.7	0		33 17	7.9	0							
HCM Lane LOS	Α	⊳		D C	A	Α							
HCM 95th %tile Q(veh)	0		ı	2.2 0.7	0								

Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

SITE LAYOUT



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Organisation: SCLALLIANCE | Createst: Thursday, June 9, 2016 1:50:01 FM.
Project: N.Projects/0625 City of Turnwater/0625,17 Turnwater Transportation Master Plan/Traffic/Operations/sidra/2040 Baseline/59) Henderson Ave at Old Hwy
99 sipp

♥ Site: 58) Henderson Ave at Old Hwy 99

Projected 2040 Baseline PM Peak Hour Roundabout

Movem	ent Perfor	Movement Performance - Vehicles	hicles							
Mov	OD OD	Demand Flows	Flows	Deg.	Average	Level of	95% Back of Queue	f Queue	Prop.	Effective
		veh/h		v/c	sec		veh	Þ		per veh
SouthEa	SouthEast: NB Old Hwy 99	1wy 99								
3x	L2	σı	2.0	0.381	7.1	LOSA	2.7	69.3	0.52	
8x	7	763	2.0	0.381	6.8	LOSA	2.8	70.9	0.52	0.34
18x	R2	132	2.0	0.381	6.6	LOSA	2.8	70.9	0.51	0.33
Approach	ä	900	2.0	0.381	6.8	LOSA	2.8	70.9	0.51	0.34
NorthEa	NorthEast: WB Henderson Ave	derson Ave								
×	L2	216	1.0	0.468	12.5	LOS B	2.5	63.9	0.71	
6x	7	⇉	1.0	0.468	12.5	LOSB	2.5	63.9	0.71	
16x	R2	22	1.0	0.468	12.5	LOSB	2.5	63.9	0.71	0.75
Approach	ä	311	1.0	0.468	12.5	LOSB	2.5	63.9	0.71	0.75
NorthWe	NorthWest: SB Old Hwy 99	∃wy 99								
7×	L2	168	1.0	0.690	13.6	LOS B	7.9	199.3	0.78	0.60
4×	7	1421	1.0	0.690	13.1	LOSB	7.9	199.3	0.77	0.57
14x	R2	16	1.0	0.690	12.7	LOSB	7.8	197.2	0.76	0.56
Approach	ä	1605	1.0	0.690	13.1	LOSB	7.9	199.3	0.77	0.58
SouthW	SouthWest: EB Airport Access	ort Access								
5x	L2	26	3.0	0.146	13.7	LOS B	0.6	16.5	0.81	0.81
2x	11	⇉	3.0	0.146	13.7	LOS B	0.6	16.5	0.81	0.81
12x	R2	⇉	3.0	0.146	13.7	LOSB	0.6	16.5	0.81	0.81
Approach	ä	47	3.0	0.146	13.7	LOS B	0.6	16.5	0.81	0.81
All Vehicles	les	2863	1.3	0.690	11.1	LOS B	7.9	199.3	0.68	0.52

Level of Service (LOS) Method: Delay & vic (HCM 2010).

Roundabout LOS Method: Same as Signalised intersections.

Vehicle movement LOS values are based on average delay and vic ratio (degree of saturation) per movement

LOS F will result if vic > 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 (vic not used as specified in HCM 2010).

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 M3D).

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

Roundabout Capacity Model: SIDRA Standard.

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Project: N/Projects/0625 City of Turnwater/0625.17 Turnwater Transportation Master Plan/Traffic/Operations/sidra/2040 Baseline/58) Henderson Ave at Old Hwy
99.sp6

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

Projected 2040 No Build PM Peak Hour

Ш	EBL	_1 EB	EBR 10	Ш	₩BL	WBT	WBR		SEE SEE	SET 1450	SER	NWL	
Traffic Vol, veh/h Future Vol, veh/h			10 10		88	0 0	125 125		130 130	1450 1450	0 0		
Conflicting Peds, #/hr	Ĉ .	2	2				2		0		0	7-0	
Sign Control RT Channelized	Stop -	Stop -	None		Stop -	Stop -	None		Free -	+ree	None	-	ı co
Storage Length							300		250				
Veh in Median Storage, #		0				0	,			0			
Grade, %		0				0	,			0			
Peak Hour Factor	95	95	95		95	95	95		95	95	95	.0	95
Heavy Vehides, %	2	2	2		_	_	_		_	_	_		_
Wwnt Flow	_	_	⇉		32	0	132		137	1526	0		_
					•							:	>
Vajor/Millor	VIIIVI	2000	C7.F	×	1700	2402	300	=	1001			7E37	
Stage 1	1800	1800	, 63		692	692	350		. 00	, c		-	. 6
Stage 2	342	702			1037	1800							
Critical Hdwy	7.54	6.54	6.94		7.52	6.52	6.92		4.12	,	,	4.12	2
Critical Hdwy Stg 1	6.54	5.54			6.52	5.52							
Critical Hdwy Stg 2	6.54	5.54	,		6.52	5.52							
-ollow-up Hdwy	3.52	4.02	3.32		3.51	4.01	3. 33		2.21			2.21	
ot Cap-1 Maneuver	28	28	347		57	29	649		899	,		438	∞
Stage 1	83	130			403	446							
Stage 2	646	439			249	132				·			
Platoon blocked, %			j		i		;						
Nov Cap-1 Maneuver	20	24	347		47	24	649		899		ì	43	38
Vlov Cap-2 Maneuver	20	24	,		47	24					,		
Stage 1	70	110	,		342	444					·		1.0
Stage 2	513	437			203	112							
Approach	EB				₩B				SE			WN	<
HCM Control Delay, s	46.1				43.9				0.8				0
HCM LOS	т				ш								
	NWL	TWN	NWR E	EBLn1WBLn1	BLn1W	WBLn2	SEL	EIS	SER				
Ainor Lane/Major Mvmt	438			100	47	649	899						
vlinor Lane/Major Mvmt Capacity (veh/h)	0 000			0.126 (0.152						
Minor Lane/Major Mvmt Capacity (veh/h) HCM Lane V/C Ratio	0.002				176.9		9.7						
Minor Lane/Major Mvmt Capacity (velvh) HCM Lane V/C Ratio HCM Control Delay (s)	13.2	0				D	Þ						
Minor Lane/Major Mvmt Capacity (velvh) HCM Lane V/C Ratio HCM Control Delay (s) HCM Lane LOS	13.2 B	A 0		ш	П	U	1						

SCJ Alliance Tumwater Transportation Master Plan

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	
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, %	ω	ω		9	9	ω	ω	
Mvmt Flow	58	16		68	16	5	221	
Major/Minor	Minor1			Major1		Major2		
Conflicting Flow All	308	76		0	0	84	0	
Stage 1	76							
Stage 2	232					,		
Critical Hdwy	6.43	6.23				4.13		
Critical Hdwy Stg 1	5.43							
Follow-In Howy Sig 2	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	В							
Minor Lane/Major Mvmt	NBT	NBRWBLn1 S	SBL SBT					
Capacity (veh/h)		- 727 18						
HCM Lane V/C Ratio		- 0.101 0.0						
HCM Control Delay (s)		- 10.5 7.4	7.4 0					
HCM Lane LOS								
HCM 95th %tile Q(veh)		- 0.3						

Synchro 9 Report 6/10/2016

Tumwater Transportation Master Plan SCJ Alliance

HCM 2010 TWSC 61: 83rd Ave & Center St

Projected 2040 No Build PM Peak Hour

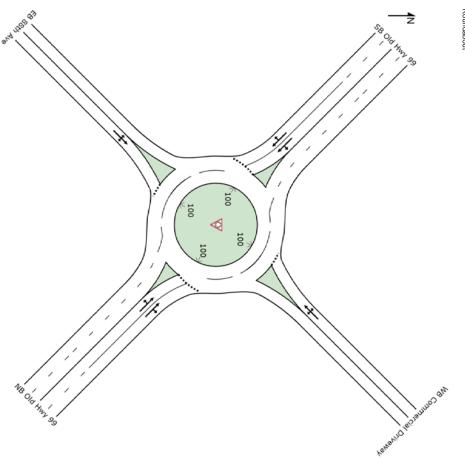
Minor Lane/Major Nvmt Capacity (velvh) HCM Lane V/C Ralio HCM Control Delay (s) HCM Lane LOS HCM Lane LOS	Approach HCM Control Delay, s HCM LOS	Stage 2 Platoon blocked, % Mov Cap-1 Maneuver Mov Cap-2 Maneuver Stage 1 Stage 2	Conflicting Flow All Stage 1 Stage 2 Critical Hdwy Critical Hdwy Stg 1 Critical Hdwy Stg 2 Critical Hdwy Stg 2 Pollow-up Hdwy Pol Cap-1 Maneuver Stage 1	Intersection Int Delay, Siveh Movement Traffic Vol, veh/h Future Vol, veh/h Conflicting Peds, #/hr Sign Control RT Channelized Storage Length Veh in Median Storage, # Grade, % Grade, % Grade, % Heavy Vehides, % Mymt Flow Major/Minor
EBL 1428 0.052 7.7 A 0.2	6.3	1428	158 4.11 	9.9 EBL 70 70 0 6 7 7 1 1 7 4 Major1
EBT WBT			0	EBT 15 15 15 15 0 0 0 0 0 0 0 0 0 0 0 0 0 0
3T WBR SBLn1 - 731 - 0.511 - 15 - 2.9				
90512	WB 0			WBT 10 10 10 10 10 10 10 10 10 10 10 10 10
			0	WBR 140 140 0 0 Free None - - - 95 3
ш	SB C	841 681 681 879 797	247 84 163 7.11 6.11 6.11 3.509 709 927	SBL 275 275 276 0 0 0 0 0 0 0 95 1 1 289
ш		978	84 - - 6.21 - - - 3.309 978	SBR 80 80 0 0 Slop None

Tumwater Transportation Master Plan SCJ Alliance

SITE LAYOUT

W Site: 62) 88th Ave at Old Hwy 99

Projected 2040 Baseline PM Peak Hour



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Organisation: SCJ ALLIANCE | Created: Thursday, June 9, 2016 1:59:17 PM
Project: N:Projects/0625 City of Turnwater/0625.17 Turnwater Transportation Master Plan/Traffic/Operations/sidra/2040 Baseline/62) 88th Ave at Old Hwy
99.stp6

MOVEMENT SUMMARY

W Site: 62) 88th Ave at Old Hwy 99

Projected 2040 Baseline PM Peak Hour Roundabout

Mover	Movement Performance - Vehicles	nance - Vel	licles								
Mov	OD	Demand I	Flows	Deg.	Average	Level of	95% Back of Queue	f Queue	Prop.	Effective	Average
₫				Satin	Delay				Queued	Stop Rate	Speed
		veh/h					veh			per veh	
SouthEa	SouthEast: NB Old Hwy 99	wy 99									
з х	2	ъ	1.0	0.189	5.1	LOS A	1.2	29.3	0.50	0.34	35.2
8x	T1	421	1.0	0.189	4.9	LOS A	1.2	30.2	0.50	0.33	35.3
18x	R2	_	1.0	0.189	4.7	LOS A	1.2	30.2	0.49	0.32	34.3
Approach	¥	427	1.0	0.189	4.9	LOS A	1.2	30.2	0.50	0.33	35.3
NorthEa	NorthEast: WB Commercial Driveway	nercial Drive	way								
×	2	Sī.	2.0	0.016	5.2	LOS A	0.1	1.6	0.53	0.39	33.9
6x	T1	Sī.	2.0	0.016	5.2	LOS A	0.1	1.6	0.53	0.39	33.8
16x	R2	_	2.0	0.016	5.2	LOS A	0.1	1.6	0.53	0.39	32.9
Approach	¥	12	2.0	0.016	5.2	LOS A	0.1	1.6	0.53	0.39	33.8
NorthW	NorthWest: SB Old Hwy 99	lwy 99									
7×	2	_	1.0	0.525	8.0	LOS A	4.9	123.9	0.16	0.04	33.8
4×	T1	979	1.0	0.525	7.9	LOS A	4.9	123.9	0.16	0.04	33.7
14x	R2	537	1.0	0.525	7.7	LOS A	4.9	123.8	0.15	0.04	32.6
Approach	ř	1517	1.0	0.525	7.8	LOS A	4.9	123.9	0.16	0.04	33.3
SouthW	SouthWest: EB 88th Ave	Ave									
5×	2	253	3.0	0.462	13.1	LOS B	2.5	64.5	0.73	0.79	29.5
2 _x	T1	σı	3.0	0.462	13.1	LOS B	2.5	64.5	0.73	0.79	29.4
12x	R2	26	3.0	0.462	13.1	LOSB	2.5	64.5	0.73	0.79	28.7
Approach	ň	284	3.0	0.462	13.1	LOSB	2.5	64.5	0.73	0.79	29.4
All Vehicles	cles	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 vic ratio (degree of saturation) per movement LOS F will result if vic > 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 (vic 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 M3D).

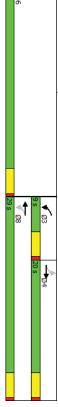
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: N.Projects\0625 City of Tumwater\0625.17 Tumwater Transportation Master Plan\Traffic\00perations\sidra\2040 Baseline\62) 88th Ave at Old Hwy
99.sp6

Lanes, Volumes, Timings 63: I-5 SB Ramps & 93rd Ave

Projected 2040 No Build PM Peak Hour

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



Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

HCM 2010 Signalized Intersection Summary 63: I-5 SB Ramps & 93rd Ave

Projected 2040 No Build PM Peak Hour

Movement Lane Configurations Traffic Volume (veh/h)	EBL	\$ ₽ ■	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations Traffic Volume (veh/h)	0	}	3	.	→	•	>	>	>	17	2 >	-4
Traffic Volume (veh/h)	>	415	2	2		,	>))	775		
The state of the s	> <	4 5	2 %	3 8	305	0	0 0	0 0	0 0	4/5	, 0	425
ruide voldille (veli/ii)	4 C	4 IO	1 75	ء د	SUC	å c	c	c	c	4/5	۰ ،	1425
Initial Q (Qb), veh	0 >	0 4	0 ‡	0 4	0 0	0 5				0 -	0 0	0 5
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				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1881	1900	1743	1743	0				1900	1827	1827
Adj Flow Rate, veh/h	0	437	100	89	321	0				500	0	268
Adj No. of Lanes	0	_	0	_	_	0				0	_	_
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	_	_	_	9	9	0				4	4	4
Cap, veh/h	0	408	93	213	694	0				808	0	721
Arrive On Green	0.00	0.28	0.28	0.05	0.40	0.00				0.46	0.00	0.46
Sat Flow, veh/h	0	1482	339	1660	1743	0				1740	0	1553
Grp Volume(v), veh/h	0	0	537	89	321	0				500	0	268
Grp Sat Flow(s),veh/h/ln	0	0	1821	1660	1743	0				1740	0	1553
Q Serve(g_s), s	0.0	0.0	16.0	2.1	7.9	0.0				12.6	0.0	6.5
Cycle Q Clear(g_c), s	0.0	0.0	16.0	2.1	7.9	0.0				12.6	0.0	6.5
Prop In Lane	0.00	>	501	212	404	0.00				909	>	731
V/C Ratio(X)	0.00	0.00	1.07	0.42	0.46	0.00				0.62	0.00	0.37
Avail Cap(c_a), veh/h	0	0	501	267	750	0				808	0	721
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	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	21.1	15.2	12.9	0.0				11.7	0.0	10.1
Incr Delay (d2), s/veh	0.0	0.0	60.6	1.3	0.5	0.0				3.5	0.0	1.5
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 BackOfQ(50%),veh/ln	0.0	0.0	16.4	1.0	 	0.0				6.8	0.0	3.0
LnGrp Delay(d),s/veh	0.0	0.0	81.7	16.5	13.4	0.0				15.2	0.0	11.5
LnGrp LOS			-	В	В					B		ω
Approach Vol, veh/h		537			410						768	
Approach Delay, s/veh		81./			, 14.1						14.0	
Approach LOS		71			В						В	
Timer	_	2	ω	4	5	6	7	8				
Assigned Phs			3	4		6		8				
Phs 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 (g_c+l1), s			4.1	18.0		14.6		9.9				
Green Ext Time (p_c), s			0.0	0.0		3.5		4.9				
Intersection Summary												
HCM 2010 Ctrl Delay			35.2									
HCM 2010 LOS			D									

Tumwater Transportation Master Plan SCJ Alliance

HCM 2010 TWSC 64: I-5 NB Ramps & 93rd Ave

Projected 2040 No Build PM Peak Hour

Notes	TICINI SUIT WINE COVERY	LICIM OF HIS OWN	HCM Lane LOS	TICIVI CUITIUI DEIdy (3)	HOM Control Dolay (c)	HCM Lane V/C Ratio	Capacity (verim)	Capacity (sobje)	Minor Lane/Major Mvmt		HCM LOS	TOM TOS	HCM Control Delay, s	Approach		Stage 2	Sidge I	Stano 1	Mov Can-2 Maneriver	Mov Cap-1 Maneuver	Platoon blocked, %	Stage 2	Stage -	Stane 1	Pot Cap-1 Maneuver	Follow-up Hdwy	Critical Hdwy Stg 2	Critical Howy Sig I	Critical Huwy	Stage 2	Stage 2	Stage 1	Conflicting Flow All	Major/Minor	Mvmt Flow	Heavy Vehicles, %	Peak Hour Factor	Grade, %	Veh in Median Storage, #	Storage Length	VI CIIdillielized	DT Channelized	Sign Control	Conflicting Peds, #/hr	Future Vol, veh/h	Traffic Vol, veh/h	Movement		Int Delay, s/veh 18.6	Intersection
		11 0	71	11.0	111 4	1.064	707	202	NBLn1				3	EB						1250					1250	2.227			4.13	٠ .			305	Major1	305	ω	95			125	2 .	-	Fron	0	290	290	EBL	i	6	
olay ove	_	_	D	0.0	000	0.244	0071	1 250	EBL											ì					,								0		584	ω	95	0	0	,		-	Fron	0	555	555	EBT			
Control of the co								- 1	EBT W													0	0	0	0										0	ω	95				NOTE	Nono	Free	0	0	0	EBR			
±. Com									WBT WBR				0	WB								0		o	0									Major2	0	000	95					-	Free	0	0	0	WBL			
nutation																				į					,										305	00	95	0	0	, ,		-	Fron	0	290	290	WBT			
+: Computation Not Defined																																	0		447	00	95			300	Tield	Viola Viola	Free	0	425	425	WBR			
											_		111.6	NB		/21	202	200	205	~ 95		121	721	271	~ 126	3.626	5.54	5.54	0.04	, ,	205	1195	1500	Minor1	137	14	95					O CO	Ston	0	130	130	NBL			
major																С		0 0	0	0		041	1 1 1 0	246	115	4.126	5.64	5.04	0.04	, , ,	305	1195	1500		0	14	95	0	0	,		0.00	Ston	0	0	0	NBT			
* All major volume in platoon																				490					490	3.426			0.34				584		163	14	95				TIEIU	Siola Siola	Ston	0	155	155	NBR			
latoon																																			0	0	95			l.		000	Ston	0	0	0	SBL			
																																			0	0	95	0	0	,		000	Ston	0	0	0	SBT			
																																			0	0	95				NOIR	None	Ston	0	0	0	SBR			

Synchro 9 Report 6/10/2016

Tumwater Transportation Master Plan SCJ Alliance

HCM 2010 TWSC 65: Kimmie St & 93rd Ave

Projected 2040 No Build PM Peak Hour

 NBT 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	NBT NB 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	NBT NBR SBL 1 10 30 1 10 30 0 0 0 0 0 Stop Stop Stop 0	NBT NBR 1 10 1 10 1 10 0 0 0 Slop Slop None - None - None - 1208 566 682 - 1526 - 6.5 6.2 5.5 - 5.5 185 528 4 3.3 185 528 4 43.3 185 528
NBT 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	NBT 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	NBT NBR SBL 1 10 30 1 1 10 30 1 1 10 30 0	NBT NBR SBL 1 10 30 1 1 10 30 1 1 10 30 0
		NBR SBL 10 30 10 0 0 Slop Slop None	NBR SBL 10 30 10 0 0 Slop Slop None

Tumwater Transportation Master Plan SCJ Alliance

HCM 2010 AWSC 66: Case Rd & 93rd Ave

Projected 2040 No Build PM Peak Hour

HCM 95th-tile Q	HCM Lane LOS	HCM Control Delay	HCM Lane V/C Ratio	Service Time	Cap	Convergence, Y/N	Departure Headway (Hd)	Degree of Util (X)	Geometry Grp	Lane Flow Rate	RT Vol	Through Vol	LT Vol	Traffic Vol by Lane	Sign Control	Vol Right, %	Vol Thru, %	Vol Left, %	Lane	HCM LOS	HOM LOS	HCM Control Delay	Conflicting Lanes Right	Conflicting Approach Right	Conflicting Lanes Left	Conflicting Approach Left	Opposing Lanes	Opposing Approach	Approach	Number of Lanes	Mvmt Flow	Heavy Vehicles, %	Peak Hour Factor	Future Vol, veh/h	Traffic Vol, veh/h	Movement	Intersection LOS	Intersection Delay, s/veh	Intersection
																														0	0	2	0.95	0	0	EBU	71	53.3	
1.9	С	16.9	0.41	6.286	437	Yes	8.218	0.408	2	179	50	35	85	170	Stop	29%	21%	50%	NELn1	-	7 0	65.8	_	NE	_	SW	2	WB	EB	0	2	ω	0.95	2	2	EBL			
14	П	65.8	1.15	4.931	528	Yes	6.931	_	ر ت	607	140	435	2	577	Stop	24%	75%	0%	EBLn1											_	458	ω	0.95	435	435	EBT			
13.4	П	68.6	1.3	5.262	486	Yes	7.562	_	7	632	0	360	240	600	Stop	0%	60%	40%	WBLn1											0	147	ω	0.95	140	140	EBR			
0.4	В	10.3	0.125	4.36	542	Yes	6.66	0.127	7	68	65	0	0	65	Stop	100%	0%	0%	WBLn2											0	0	2	0.95	0	0	WBU			
ω	C	19.9	0.527	6.196	442	Yes	8.139	0.526	2	233	_	80	140	221	Stop	0%	36%	63%	SWLn1	-	7	62.9	_	WS	_	NE	_	EB	WB	0	253	2	0.95	240	240	WBL			
																														_	379	2	0.95	360	360	WBT			
																														_	68	2	0.95	65	65	WBR			
																														0	0	2	0.95	0	0	NEU			
																				c		16.9	2	WB	_	EB	_	SW	NE	0	89	0	0.95	85	85	NEL			
																															37	0	0.95	35	35	NET			
																														0	53	0	0.95	50	50	NER			

Synchro 9 Report 6/10/2016

Tumwater Transportation Master Plan SCJ Alliance

HCM 2010 AWSC 66: Case Rd & 93rd Ave

Projected 2040 No Build PM Peak Hour

Intersection					
Intersection Delay, s/veh					
Intersection LOS					
Movement	UWS	SWL	TWS	SWR	
Traffic Vol, veh/h	0	140	80	_	
Future Vol, veh/h	0	140	80	_	
Peak Hour Factor	0.95	0.95	0.95	0.95	
Heavy Vehides, %	2	_	_	_	
Mvmt Flow	0	147	84	_	
Number of Lanes	0	0	_	0	
Approach		WS			
Opposing Approach		NE			
Opposing Lanes		_			
Conflicting Approach Left		WB			
Conflicting Lanes Left		2			
Conflicting Approach Right		EB			
Conflicting Lanes Right					
		_			
HCM Control Delay		19.9			
HCM Control Delay HCM LOS		19.9 C			
HCM Control Delay HCM LOS		19.9 C			

Tumwater Transportation Master Plan SCJ Alliance

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

Projected 2040 No Build PM Peak Hour

Intersection Intersection Delay, siveh Intersection LOS Movement	53.5 F EBU	EBT	EBR	WBU	WBL	WBT	NBU	NBL
Movement Traffic Vol. veh/h	EBU	385 EBT	235 EBR	WBU	WBL 265	WBT 485	NBU	NBL 170
Future Vol. veh/h	0 0	385	235	0 0	265	485	0 0	170
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	2	ω	ω	2	2	2	2	
Mvmt Flow	0	405	247	0	279	511	0	179
Number of Lanes	0	_	0	0	0	_	0	_
Approach		EB			WB			NB
Opposing Approach		WB			EB			
Opposing Lanes					_			0
Conflicting Approach Left					NB			EB
Conflicting Lanes Left		0			_			
Conflicting Approach Right		7 R			>			₩.
HCM Control Delay		59.4			61			17.2
HCM LOS		TI.			TI.			С
Lane	NBLn1	EBLn1	WBLn1					
Vol Left, %	67%	0%	35%					
Vol Thru, %	0%		65%					
Vol Right, %	33%		0%					
Sign Control	Stop		Stop					
Traffic Vol by Lane	255	620	750					
LT Vol	170		265					
Through Vol	0		485					
RT Vol	85		0					
Lane Flow Rate	268	653	789					
Geometry Grp			_					
Degree of Util (X)	0.518		_					
Departure Headway (Hd)	6.947		5.973					
Convergence, Y/N	Yes		Yes					
Cap	523		616					
Service Time	4.947	3.717	3.998					
HCM Lane V/C Ratio	0.512		1.281					
HCM Control Delay	17.2		61					
HCM Lane LOS	0		T					
HCM 95th-tile Q	2.9	15.4	15					

Synchro 9 Report 6/10/2016

Tumwater Transportation Master Plan SCJ Alliance

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

Projected 2040 No Build PM Peak Hour

HCM Lane LOS	HCM Control Delay (s)	HCM Lane V/C Ratio	Capacity (veh/h)	linor Lane/Major Mvmt	HCM LOS	HCM Control Delay, s	pproach	Stage 2	Stage 1	Mov Cap-2 Maneuver	Nov Cap-1 Maneuver	Platoon blocked, %	Stage 2	Stage 1	ot Cap-1 Maneuver	ollow-up Hdwy	Critical Hdwy Stg 2	Critical Hdwy Stg 1	itical Hdwy	Stage 2	Stage 1	Conflicting Flow All	//Ajor/Minor		Nmt Flow	Heavy Vehicles. %	Peak Hour Factor	Grade. %	/eh in Median Storage. #	storage Length	RT Channelized	ign Control	Conflicting Peds, #/hr	Future Vol, veh/h	raffic Vol, veh/h	Novement	ni Delay, s/ven 13.4	
2 A	8.6	0.107	1133	EBL		2.1	EB				1133				1133	2.218			4.12			426	Major1	į	121	2	95					Free	0	115	115	EBL	4	,
A	0			EBT V																		0			379	2 6	95	0	0		None	Free	0	360	360	EBT		
F	60		230	WBT WBR SBLn1 SBLn2																																		
, ''	20.2	3 0.655) 659	I SBLn2		0	WB												,				Major2		358	ω i	95	0	0				0	340	340	WBT		
																			í			0		:	& d	ω i	95				None	Free	0	65	65	WBR		
					D	31.9	SB	465	685	230	230		538	685	266	3.509	5.41	5.41	6.41	621	392	1013	Minor2	:	179	ن د	SG (0	0	250	, .	Stop	0	170	170	SBL		
									,		659				659	3.309			6.21			392		į	432	<u> </u>	95			0	None	Stop	0	410	410	SBR		

Tumwater Transportation Master Plan SCJ Alliance

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

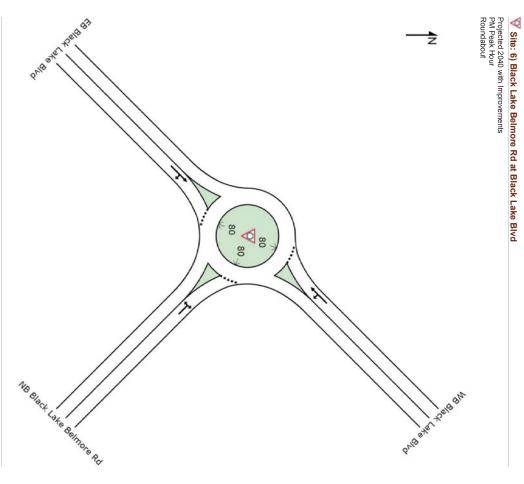
Projected 2040 No Build PM Peak Hour

Int Delay, s/veh 6						
Novement	EBT E	BR	WBL V	WBT	NEL	NER
raffic Vol, veh/h		30		340	15	205
Future Vol, veh/h	890	30		340	15	205
conflicting Peds, #/hr		0		0	0	0
sign Control	_	ree		ree	Stop	Stop
RT Channelized		None		None		None
storage Length		450	300		300	0
eh in Median Storage, #	0			0	2	
Grade, %	0			0	0	
eak Hour Factor	95	95		95	95	95
leavy Vehicles, %	_	_		2	_	_
/lvmt Flow	937	32		358	16	216
/lajor/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	937	0	1695	937
Stage 1			·		937	ı
Stage 2					758	
itical Hdwy		٠	4.12		6.41	6.21
Critical Hdwy Stg 1					5.41	
Critical Hdwy Stg 2					5.41	
ollow-up Hdwy		٠	2.218		3.509	3.309
ot Cap-1 Maneuver			731		103	322
Stage 1		٠			383	
Stage 2					465	
Platoon blocked, %						
Nov Cap-1 Maneuver			731		75	322
Vlov Cap-2 Maneuver		•			250	
Stage 1		•			383	
Stage 2					338	
pproach	EB		WB		NE	
ICM Control Delay, s	0		4.2		35.1	
HCM LOS					Е	
/linor Lane/Major Mvmt	NELn1 NELn2 E	BT EBR	WBL V	WBT		
Capacity (veh/h)			731			
HCM Lane V/C Ratio			0.274			
ICM Control Delay (s)	20.4 36.2		11.8			
HCM Lane LOS			В			

Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

SITE LAYOUT



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W Site: 6) Black Lake Belmore Rd at Black Lake Blvd

Projected 2040 with Improvements PM Peak Hour Roundabout

Movem	Movement Performance - Vehicles	nance - Ve	hicles								
Mov	OD	Demand Flows	Flows	Deg.	Average	Level of	95% Back of Queue	f Queue	Prop.	Effective	Average
₫				Satn					Queued	Stop Rate	Speed
										per veh	
SouthEa	SouthEast: NB Black Lake Belmore Rd	Lake Belmo	ire Rd								
3x	L2	221	1.0	0.457	8.8	LOSA	3.4	86.2	0.57	0.40	31.7
18x	72	242	1.0	0.457	8.8	LOSA	3.4	86.2	0.57	0.40	30.9
Approach	ä	463	1.0	0.457	8.8	LOSA	3.4	86.2	0.57	0.40	31.3
NorthEa	NorthEast: WB Black Lake Blvd	Lake Blvd									
×	L2	263	0.0	0.674	13.8	LOSB	7.3	182.6	0.75	0.58	29.9
6x	⇉	432	0.0	0.674	13.8	LOSB	7.3	182.6	0.75	0.58	29.9
Approach	ä	695	0.0	0.674	13.8	LOS B	7.3	182.6	0.75	0.58	29.9
SouthWe	SouthWest: EB Black Lake Blvd	Lake Blvd									
2×	⇉	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	ä	289	3.0	0.313	7.2	LOSA	2.1	52.5	0.57	0.42	33.2
All Vehicles	les	1447	0.9	0.674	10.9	LOSB	7.3	182.6	0.66	0.49	30.9
l evel of c	level of Cervice (LOC) Method: Delay & v/c (HOM 2010)	Method: D	play & v/o	HCM 2010)							

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 M3D).

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

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Project: N.Projects0625 City of Tumwater\0825.17 Tumwater\Transportation\Master Plan\Traffic\00000perations\sidra2040\With\Imp\6)\Black\Lake\Belimore\Rd\ at\
Black\Lake\Big\00000d\u00dc\u00dc\u00dc\u00dc\u00000peration\u00dc\u00dc\u00dc\u00dc\u00dc\u00dc\u00dc\u00dc\u00000peration\u00dc\u00dc\u00dc\u00dc\u00dc\u00dc\u00dc\u00dc\u00000peration\u00dc\u

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	

SCJ Alliance Tumwater Transportation Master Plan SimTraffic Report 2/17/2016

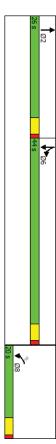
Lanes, Volumes, Timings 14: 2nd Ave & Custer Way

Projected 2040 with Imp

					1.5	Actuated Cycle Length: 74.5 Natural Cycle: 80
						Cycle Length: 90
					Other	Area Type:
						Intersection Summary
Max	Max		None	None	None	Recall Mode
						Lead-Lag Optimize?
						Lead/Lag
4.5	4.5		4.5	4.5	4.5	Total Lost Time (s)
0.0	0.0		0.0	0.0	0.0	Lost Time Adjust (s)
1.0	1.0		1.0	1.0	1.0	All-Red Time (s)
3.5	3.5		3.5	3.5	3.5	Yellow Time (s)
48.9%	48.9%		28.9%	22.2%	22.2%	Total Split (%)
44.0	44.0		26.0	20.0	20.0	Total Split (s)
20.0	20.0		24.5	10.0	10.0	Minimum Split (s)
4.0	4.0		4.0	4.0	4.0	Minimum Initial (s)
						Switch Phase
6	6		2	8	8	Detector Phase
				00		Permitted Phases
6	6		2		00	Protected Phases
NA	Split		NA	Perm	Prot	Turn Type
	34%					Shared Lane Traffic (%)
0%	0%	1%	1%	1%	1%	Heavy Vehicles (%)
0.95	0.95	0.95	0.95	0.95	0.95	Peak Hour Factor
11.5			46.3		15.0	Travel Time (s)
505			2035		662	Link Distance (ft)
30			30		30	Link Speed (mph)
		Yes		Yes		Right Turn on Red
	25				25	Taper Length (ft)
	_	0		_		Storage Lanes
	0	0		225	0	Storage Length (ft)
1900	1900	1900	1900	1900	1900	Ideal Flow (vphpl)
310	915	320	15	260	235	Future Volume (vph)
310	915	320	15	260	235	Traffic Volume (vph)
٤,	J,		₽÷	74	. #	Lane Configurations
SBT	SBL	NBR	NBT	WBR	WBL	Lane Group
←	•	•	→	-	•	

Splits and Phases: 14: 2nd Ave & Custer Way

Control Type: Actuated-Uncoordinated



Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

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

Projected 2040 with Imp

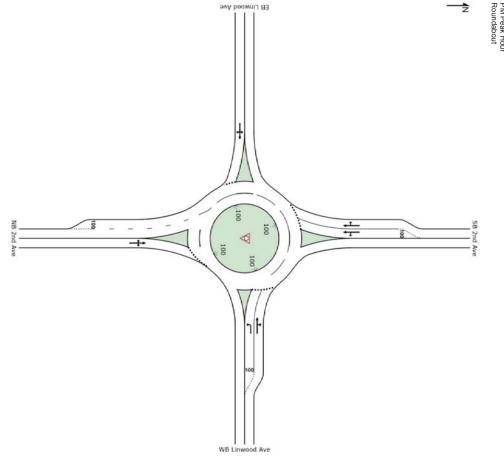
	^	<i>></i>	→	*	•	—		
Movement	WBL .	WBR	NBT .	NBR .	SBL	SBT		
Lane Configurations	_#	-1	❖		_31	2 ,		
Traffic Volume (veh/h)	235	260	3.	320	915	310		
Future Volume (veh/h)	235	260	15	320	915	310		
Number	. ω	o	2	12	o <u> </u>	6		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00	1.00	100	1.00	1.00	3		
Adi Sat Flow, veh/h/ln	1881	1881	1881	1900	1900	1900		
Adj Flow Rate, veh/h	247	121	16	184	644	772		
Adj No. of Lanes	_	_	_	0	_	_		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95		
Percent Heavy Veh, %	_	_	_	_	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		
Grp Volume(v), veh/h	247	121	0	200	644	772		
Grp Sat Flow(s),veh/h/ln	1792	1599	0	1618	1810	1900		
Cycle O Clear(n.c) s	10.3	57 C	0.0	9.2	20.8	25.8		
Prop In Lane	1.00	1.00		0.92	1.00			
Lane Grp 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	300	451	926	1972		
Instream Filter(I)	100	1 00	0.00	1 .	100	1		
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 BackOfQ(50%),veh/ln	6.1	2.4	0.0	4.3	11.3	15.1		
LnGrp Delay(d),s/veh	43./	29.8	0.0	34.4	18.6	22.1		
LIGIPLOS		-	3	C	a	1		
Approach Vol, ven/n Approach Delay s/yeh	30 2		2/ /			20.5		
Approach LOS	D		0			0		
Timer		2	ယ	4	5	6	7	8
Assigned Phs		2				6		8
Phs 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
Green Ext Time (g_c+11), S		05				6.1	_	0.2
Ciccii Ext. Illio (b-c), o		ć				<u>ç</u>		
Intersection Summary								
HCM 2010 Ctrl Delay			25.4					
HCM 2010 LOS			С					
Notes								

Tumwater Transportation Master Plan SCJ Alliance

SITE LAYOUT

W Site: 25) Linwood Ave at 2nd Ave

Projected 2040 with Improvements PM Peak Hour Roundabout



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MOVEMENT SUMMARY

Y Site: 25) Linwood Ave at 2nd Ave

Projected 2040 with Improvements PM Peak Hour Roundabout

Movem Mov	Movement Performance - Vehicles Mov OD Demand Flows	ance - Vehicles Demand Flows	hicles Flows	Deg.	Average	Level of	95% Back of Queue	Queue	Prop.	Effective	Average
										per veh	mph
South: N	South: NB 2nd Ave										
ω	2	189	2.0	0.780	23.6	LOSC	9.4	239.8	0.93	1.07	26.9
00	Т1	321	2.0	0.780	23.6	LOSC	9.4	239.8	0.93	1.07	26.8
8	R2	68	2.0	0.780	23.6	LOSC	9.4	239.8	0.93	1.07	26.2
Approach	ä	579	2.0	0.780	23.6	LOSC	9.4	239.8	0.93	1.07	26.8
East W	East WB Linwood Ave										
_	2	263	2.0	0.401	11.1	LOS B	2.8	72.4	0.84	0.79	30.1
6	Т1	321	2.0	0.479	10.8	LOSB	4.1	103.6	0.88	0.82	32.3
16	R2	68	2.0	0.479	10.8	LOSB	4.1	103.6	0.88	0.82	31.3
Approach	ä	653	2.0	0.479	10.9	LOS B	4.1	103.6	0.87	0.81	31.2
North: S	North: SB 2nd Ave										
7	2	189	2.0	0.679	17.0	LOS B	5.5	140.7	0.84	0.94	29.2
4	T1	347	2.0	0.679	17.0	LOS B	5.5	140.7	0.84	0.94	29.1
14	R2	189	2.0	0.359	12.4	LOSB	1.7	43.8	0.71	0.72	30.6
Approach	ä	726	2.0	0.679	15.8	LOSB	5.5	140.7	0.81	0.88	29.5
West: El	West: EB Linwood Ave										
O	2	137	2.0	0.803	33.0	LOSC	9.7	246.5	1.00	1.27	24.2
2	T1	153	2.0	0.803	33.0	LOSC	9.7	246.5	1.00	1.27	24.2
12	R2	137	2.0	0.803	33.0	LOSC	9.7	246.5	1.00	1.27	23.7
Approach	ä	426	2.0	0.803	33.0	LOSC	9.7	246.5	1.00	1.27	24.0
All Vehicles	des	2384	2.0	0.803	19.4	LOSB	9.7	246.5	0.89	0.98	28.1

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 vic ratio (degree of saturation) per movement LOS F will result if vic > 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 (vic not used as specified in HCM 2010).

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 M3D).

Roundabout Capacity Model: SIDRA Standard.

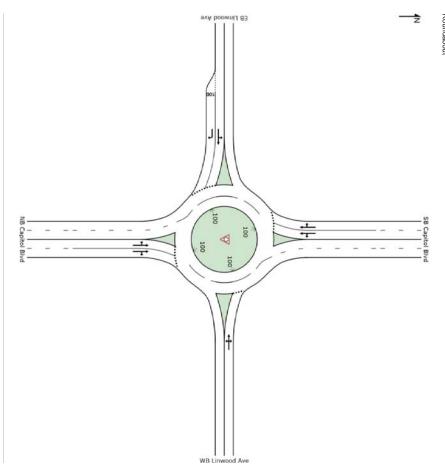
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Organisation: SQL ALLANCE | Processed: Wednesday, February 17, 2016, 3.08-27 PM
Project: N.Projects\0.0825 City of Turnwater\0.625, 17 Turnwater Transportation Master Plan\Traffic\0.0perations\sidra\2040 With Imp\25\) Linwood Ave at 2nd
Ave.sip6

SITE LAYOUT

W Site: 26) Linwood Ave at Capitol Blvd

Projected 2040 With Improvements PM Peak Hour Roundabout



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Organisation: SCJ ALLANCE | Created: Friday, February 5, 2016 639:32 PM
Project: N/Projects/0625 City of Turnwaten/0625.17 Turnwater Transportation Master Plan/Traffic/Operations/sidra/2040 With Imp/26) Linwood Ave at Capitol Bivd.s/p6

MOVEMENT SUMMARY

Site: 26) Linwood Ave at Capitol Blvd

Projected 2040 With Improvements PM Peak Hour Roundabout

		1									
Movem	Movement Performance - Venicles	ance - ver	licies							1	
D 80	Mov	Total HV	HV S	Satn	Delay	Service	Vehicles Distan	Distance	Queued	Stop Rate	Speed
		veh/h	%	v/c	sec		veh	#		per veh	mph
South: N	South: NB Capitol Blvd										
ω	2	226	2.0	0.556	9.5	LOS A	5.3	133.8	0.56	0.34	32.2
00	Т1	1147	2.0	0.556	9.1	LOS A	5.4	136.3	0.55	0.33	32.8
18	R2	16	2.0	0.556	8.9	LOS A	5.4	136.3	0.54	0.32	32.2
Approach	ד	1389	2.0	0.556	9.2	LOS A	5.4	136.3	0.55	0.33	32.7
East WE	East WB Linwood Ave										
_	2	16	2.0	0.071	9.1	LOS A	0.3	7.4	0.72	0.72	32.0
0	Т1	σı	2.0	0.071	9.1	LOS A	0.3	7.4	0.72	0.72	31.8
16	R2	⇉	2.0	0.071	9.1	LOS A	0.3	7.4	0.72	0.72	31.1
Approach	ד	32	2.0	0.071	9.1	LOS A	0.3	7.4	0.72	0.72	31.6
North: SI	North: SB Capitol Blvd										
7	2	⇉	2.0	0.843	22.3	LOSC	15.5	393.4	0.98	0.88	27.8
4	Т1	1500	2.0	0.843	21.7	LOSC	15.5	393.4	0.97	0.86	28.0
14	R2	421	2.0	0.843	20.7	LOSC	15.5	393.2	0.96	0.82	27.5
Approach	ד	1932	2.0	0.843	21.5	LOSC	15.5	393.4	0.97	0.85	27.9
West: EF	West: EB Linwood Ave										
O	2	121	2.0	0.427	23.1	LOSC	2.2	57.1	0.87	0.91	26.1
2	Т1	σı	2.0	0.427	23.1	LOSC	2.2	57.1	0.87	0.91	26.0
12	R2	268	2.0	0.648	26.5	LOSC	4.5	115.5	0.95	1.05	25.6
Approach	ъ	395	2.0	0.648	25.4	LOSC	4.5	115.5	0.92	1.00	25.8
All Vehicles	les	3747	2.0	0.843	17.2	LOSB	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 vic ratio (degree of saturation) per movement LOS F will result if vic > 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 (vic 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 M3D).

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

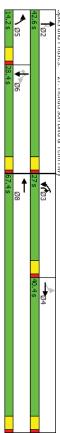
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Project. N.Projects10625 City of Tumwater0625.17 Tumwater Transportation Master Plan\taffic\Operations\sidra12040 With Imp\tilde{26}\) Linwood Ave at Capitol
Bivd.sip6

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

Projected 2040 with Imp

EBL 10 10 10 10 10 10 10 10 200 200 1 17 25	EBI 955 955 1900 1947 44.3 0.98 1%	EBR 195 1900 0 0 0 Ves 0.98	WBL 510 510 510 1900 450 2 25 25 0.98 1% Prot 3	₩BT ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑	WBR 85 85 1900 0 0 0 Yes	NBL NBL 140 140 140 200 200 200 17 18 18 18 18 5	NBT 200 200 1900 1900 1900 1900 200 200 200 200 200 200 200 200 200	NBR 700 700 1900 1900 100 100 1 1 Yes 0.98 0.98 0.98 1%	SBL 230 230 1900 0 0 1 9 0 0 1 9 0 0 1 9 0 0 0 1 9 0 0 0 0	SBT 335 335 1900 1606 36.5 0.98 1% NA 6	SBR 30 30 1900 150 17 7 Yes 1% Perm
Telli	4 NA		3	8 NA		5		3	Term	6 NA	rein
4								2	6		6
4	4		ω	00		5	2	ω	6	6	6
6.0	6.0		5.0	6.0		5.0	6.0	5.0	6.0	6.0	6.0
24.5	24.5		9.5 27.0	24.5		9.5 14.2	24.5	9.5 27.0	24.5	24.5	24.5
	36.7%		24.5%	61.3%		12.9%	38.7%	24.5%	25.8%	25.8%	25.8%
	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5
Yes	Yes		Yes			Yes		Yes	Yes	Yes	Yes
Max	Max		None	Max		None	None	None	None	None	None
ler											
dinated											
		<u>မ</u>	EBT PS S S S S S S S S S S S S S S S S S S	EBT EBR P55 195 955 195 955 196 956 197 976 1947 1947 1947 1947 1947 1947 1947 1947	EBT EBR WBL W The BT EBR WB THE BT EBR	EBI EBR WBI WBI VBI VBI VBI VBI VBI VBI VBI VBI VBI V	EBI EBR WEL WEI WBR 195 510 780 85 955 195 510 780 85 955 195 510 780 85 955 195 510 780 85 955 195 510 780 85 955 195 510 780 85 955 195 510 780 85 956 1900 1900 1900 1900 0	EBT EBR WBL WBT WBR NBL 195	HEBI EBR WBL WBT WBR NBL NBT 195 195 510 780 85 140 200 955 195 510 780 85 140 200 955 195 510 780 85 140 200 955 195 510 780 85 140 200 955 195 510 780 85 140 200 905 1900 1900 1900 1900 1900 0	## EBR WBL WBT WBR NBL NBT NBR NBL NBR NBB NBB NBB NBB NBB NBB NBB NBB NBB	EBI EBR WBL WBI WBR NBL WB NBR SBL ↑↑ ↑↑ ↑↑ ↑↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑

Splits and Phases: 27: Henderson Blvd & Yelm Hwy



Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

HCM 2010 Signalized Intersection Summary 27: Henderson Blvd & Yelm Hwy

Projected 2040 with Imp

HCM 2010 LOS	HCM 2010 Ctrl Delay	Intersection Summary	Green Ext Time (p_c), s	Max Q Clear Time (g_c+l1), s	Max Green Setting (Gmax), s	Change Period (Y+Rc), s	Phs Duration (G+Y+Rc), s	Assigned Phs	Timer	Approach LOS	Approach Delay, s/veh	Approach Vol, veh/h	LnGrp LOS	LnGrp Delay(d),s/veh	%ile BackOfO(50%).veh/ln	Initial O Delay(d3).s/veh	Incr Delay (d2) s/yeh	Uniform Delay (d) skeh	How Platout Ratio	Avail Cap(c_a), veh/h	V/C Ratio(X)	Lane Grp Cap(c), veh/h	Prop In Lane	Cycle Q Clear(g_c), s	Q Serve(g_s), s	Grp Sat Flow(s),veh/h/ln	Grp Volume(v), veh/h	Sat Flow, veh/h	Arrive On Green	Cap, veh/h	Percent Heavy Veh. %	Auj No. of Laties	Adj Flow Rate, veh/h	Adj Sat Flow, veh/h/ln	Parking Bus, Adj	Ped-Bike Adj(A_pbT)	Initial Q (Qb), veh	Number	Future Volume (veh/h)	Traffic Volume (veh/h)	Lane Configurations	Movement	
									_				С	25.5	0.2	0.0	0.0	25.2	1.00	2/4	0.04	274	1.00	1.2	1.2	635	10	635	0.33	274	1	000 -	10	1881	1.00	1.00	0	7	10	10.	H	EBL	-
			4.5	10.7	38.1	4.5	42.3	2	2	ш	71.6	1168	ш	71.7	23.1	0.0	25.0	36.7	1.00	585	0.99	585		35.4	35.4	1787	579	3002	0.33	983		000 0	974	1881	1.00		0	4	955	955	≯	EBT	ţ
D	54 7		0.0	24.5	22.5	4.5	27.0	ω	ω				Е	72.2	23.1	0.0	22 25	26.00	1.00	583	0.99	583	0.32	35.5	35.5	1781	579	566	0.33	185		000	184	1900	1.00	1.00	0	14	195	195		EBR	4
			0.0	37.5	35.9	4.5	40.4	4	4				F	86.0	10.7	0.0	A 2 A	436	1.8	515	1.01	515	1.00	22.5	22.5	1254	520	2508	0.21	515		0000	520	1881	1.00	1.00	0	ω	510	510	J J	WBL	4
			0.0	10.7	9.7	4.5	14.2	5	5	D	41.1	1398	В	14.5	7.7	0.0	<u>ا</u> د د	13.7	1.00	1025	0.42	1025		15.0	15.0	1787	435	3272	0.57	1876		000	796	1881	1.00		0	00	780	780	*	WBT	†
			0.3	23.3	23.9	4.5	28.1	6	6				В	14.5	7.9	0.0	1 2	13.0	1.8	1045	0.42	1045	0.18	15.0	15.0	1822	443	337	0.57	193		000	82	1900	1.00	1.00	0	18	89	85		WBR	-
									7				Ŧ	93.9	6.2	0.0	44.5	49 F	1.00	1 20	0.90	158	1.00	8.7	8.7	1792	143	1792	0.09	158		0 00 -	143	1881	1.00	1.00	0	5	140	140	Ħ	NBL	۶
			22.4	17.0	62.9	4.5	67.4	00	8	D	54.4	347	С	26.7	4.6	0.0	0.3	26.4	1.00	653	0.31	648		8.7	8.7	1881	204	1881	0.34	648		000 -	204	1881	1.00		0	2	200	200	>	NBT	→
														0.0	0.0	0.0	000	0.00	0.00	2883	0.00	879	1.00	0.0	0.0	1599	0	1599	0.00	879		0 00 -	0	1881	1.00	1.00	0	12	700	700	×	NBR	*
													D	50.4	7.7	0.0	2 2	42 2	1.00	324	0.73	320	1.00	21.3	21.3	1185	235	1185	0.22	320		000	235	1881	1.00	1.00	0	_	230	230	Ħ	SBL	•
										D	53.6	582	Е	56.1	11.6	0.0	14.5	41 3	1 .	410	0.85	405		19.1	19.1	1881	342	1881	0.22	405		000 -	342	1881	1.00		0	6	335	335	>	SBT	←
													C	33.9	0.1	0.0	000	ر م د	1.00	348	0.01	344	1.00	0.3	0.3	1599	ر ت	1599	0.22	344		000	ω v	1881	1.00	1.00	0	16	30	30	×	SBR	•

Tumwater Transportation Master Plan SCJ Alliance

HCM 2010 TWSC 28: Trosper Rd & Rural Rd

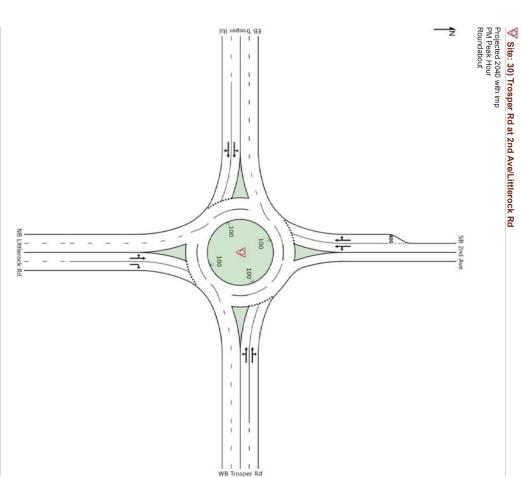
Projected 2040 with Imp

Minor Lane/Major (Mymt Capacity (Veh/h) HCM Lane V/C Ratio HCM Control Delay (s) HCM Lane LOS HCM 55th %tile Q(veh)	HCM Control Delay, s HCM LOS	Approach	Stage 2	Stage 1	Mov Cap-1 Maneuver	Platoon blocked, %	Stage 2	Stage 1	Pot Cap-1 Maneuver	Follow-up Hdwy	Critical Hdwy Stg 2	Critical Hdwy Stg 1	Critical Hdwy	Stage 2	Stage 1	w All	Major/Minor N	Mvmt Flow	Heavy Vehicles, %	Peak Hour Factor	Grade, %	Veh in Median Storage, #	Storage Length	RT Channelized	Sign Control	Conflicting Peds, #/hr	Future Vol, veh/h	Traffic Vol, veh/h	Movement	Int Delay, s/veh 4.9	Intersection
996 0.116 9.1 A 0.4	2.7	EB			- 064	90			996	2.2	·		4.1		í	589	/lajor1	116	0	%			150			0	110	110	EBL		
EBT									·				·		í	0		279	0	95	0	0		None	Free	0	265	265	EBT		
WBT WBR SBLn1 SBLn2 - 427 558 - 0.37 0.311 - 18.3 14.3 - C B - C B - 1.7 1.3		WB															Major2	447		95					Free		425	425	WBT		
3 B 3 1 1 8 2	0	В				ľ										- 0	2	_		5 95		0 -		- None		0 0		5 135	T WBR		
ш	16.2 C	SB	532	598	427	2	602	598	259	3.518	5.42	5.42	6.42	511	518	1029	Minor2	158	2	95	0	2	150		Stop	0	150	150	SBL		
Ш					550	FF 0			558	3.318			6.22			518		174	2	95			0	None	Stop	0	165	165	SBR		
Ш																															

Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

SITE LAYOUT



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Organisation: SCJ. ALLIANCE | Coreated: Thursday, February 25, 2016 7:171-12 PM
Project: N:Projects)0625 City of Turnwater0625.17 Turnwater Transportation Master Plan/Traffic/Operations/sidra/2040 Trosper.sp6

W Site: 30) Trosper Rd at 2nd Ave/Littlerock Rd

Projected 2040 with imp PM Peak Hour Roundabout

proach		12 R2	2 T1	5 L2	West: EB Trosper Rd	Approach	14 R2	4 T1	7 L2	North: SB 2nd Ave	Approach	16 R2	6 T1	1 L2	East: WB Trosper Rd	Approach	18 R2	8 T1	3 L2	South: NB Littlerock Rd		Mov OD Mov	Movement Performance - Vehicles
201	732	184	458	89	PS	805	116	516	174		858	21	384	453	ν	1279	500	437	342	k Rd		Deman Total	rmance - V
,	2.0	2.0	2.0	2.0		2.0	2.0	2.0	2.0		2.0	2.0	2.0	2.0		2.0	2.0	2.0	2.0			Demand Flows Total HV	ehicles
0	0.636	0.636	0.636	0.636		0.751	0.751	0.751	0.751		0.853	0.853	0.853	0.853		0.961	0.738	0.961	0.961			Deg. Satn	
2	19.7	18.5	20.0	21.2		28.0	26.2	27.7	30.1		40.4	42.1	42.1	38.8		36.3	22.5	45.2	45.2			Average Delay	
	LOS B	LOSB	LOS B	LOSC		LOSC	LOSC	LOSC	LOSC		LOS D	LOSD	LOSD	LOSD		LOS D	LOSC	LOSD	LOS D			Level of Service	
100	4.8	4.8	4.8	4.5		6.5	6.5	6.5	6.0		12.5	11.6	12.5	12.5		18.5	6.5	18.5	18.5			95% Back of Queue Vehicles Distan	
4600	122.3	122.3	122.3	114.2		165.1	165.1	165.1	152.6		317.3	294.9	317.3	317.3		469.2	164.8	469.2	469.2			of Queue Distance	
0 0 0	0.88	0.89	0.88	0.88		0.93	0.94	0.93	0.93		1.00	1.00	1.00	1.00		0.95	0.88	1.00	1.00			Prop. Queued	
1 20	0.99	1.00	0.99	0.99		1.10	1.10	1.10	1.09		1.32	1.32	1.32	1.33		1.31	1.01	1.50	1.50		per veh	Effective Stop Rate	
24.3	28.3	28.3	28.4	27.9		25.6	25.9	25.8	24.9		22.3	22.0	22.4	22.2		23.2	26.9	21.4	21.4			Average Speed	

Level of Service (LOS) Method: Delay & vic (HCM 2010).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay and vic ratio (degree of saturation) per movement LOS relues are based on average delay and vic ratio (degree of saturation) per movement LOS F will respective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (vic 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 M3D).

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

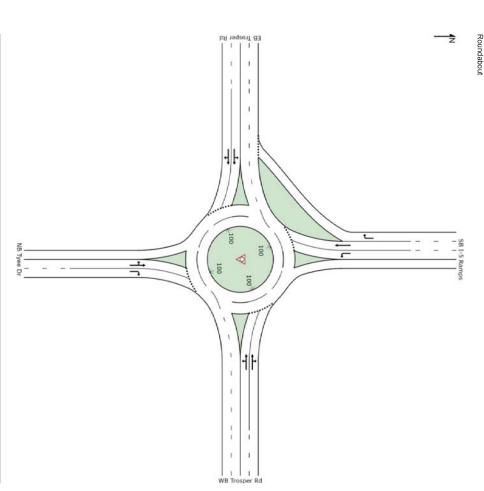
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Project: N.Projects/6625 City of Tumwater/0625.17 Tumwater/Tansportation Master Plan/Traffic/Operations/sidra/2040 Trosper.sip6

SITE LAYOUT

♥ Site: 31) Tropser Rd at Tyee Dr/SB I-5 Ramps

Projected 2040 With Imp PM Peak Hour



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♥ Site: 31) Tropser Rd at Tyee Dr/SB I-5 Ramps

Projected 2040 With Imp PM Peak Hour Roundabout

All Vehicles	Approach	12	2	σı	West: E	Approach	14	4	7	North:	Approach	16	6	_	East: V	Approach	18	œ	ω	South:		ΞM	Mover
icles	ch	R2	7	[2	West: EB Trosper Rd	ch	R2	7	[2	North: SB I-5 Ramps	ch	R2	7	[2	East: WB Trosper Rd	ch	R2	Τ1	[2	South: NB Tyee Dr		Mov	Movement Performance - Vehicles
4168	1084	26	842	216	<u>.</u>	1358	500	453	405	0,	1068	421	358	289	_	658	458	163	37		veh/h	Demand Flows Total HV	mance - Ve
2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0	2.0		2.0	2.0	2.0	2.0		2.0	2.0	2.0	2.0			Flows HV	hicles
0.918	0.898	0.898	0.898	0.898		0.472	0.399	0.426	0.472		0.564	0.564	0.564	0.564		0.918	0.918	0.571	0.571			Deg. Satn	
23.3	41.7	39.5	41.1	44.3		8.2	6.8	8.0	10.2		11.4	11.2	11.5	11.6		43.3	50.9	25.9	25.9			Average Delay	
LOSC	LOS D	LOS D	LOS D	LOS D		LOSA	LOSA	LOSA	LOS B		LOS B	LOS B	LOS B	LOS B		LOS D	LOS D	LOS C	LOS C			Level of Service	
11.3	11.3	11.3	11.3	10.4		3.0	2.3	2.7	3.0		4.5	4.5	4.5	4.5		11.0	11.0	3.3	3.3		veh	95% Back of Queue Vehicles Distan	
288.1	288.1	288.1	288.1	264.7		77.1	59.2	68.2	77.1		114.2	114.2	114.2	113.3		279.7	279.7	83.3	83.3			f Queue Distance	
0.80	0.97	0.98	0.97	0.96		0.65	0.54	0.70	0.73		0.71	0.71	0.71	0.72		0.96	1.00	0.87	0.87			Prop. Queued	
0.91	1.34	1.35	1.34	1.33		0.59	0.43	0.64	0.74		0.65	0.65	0.66	0.66		1.26	1.40	0.96	0.96		per veh	Effective Stop Rate	
26.9	22.3	22.5	22.5	21.6		32.5	33.2	33.7	30.4		31.1	31.1	31.2	30.8		21.6	20.0	26.4	26.5		mph	Average Speed	

Level of Service (LOS) Method: Delay & vic (HCM 2010).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay and vic ratio (degree of saturation) per movement LOS relues are based on average delay and vic ratio (degree of saturation) per movement LOS F will respective of movement delay value (does not apply for approaches and intersection).

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Roundabout Capacity Model: SIDRA Standard.

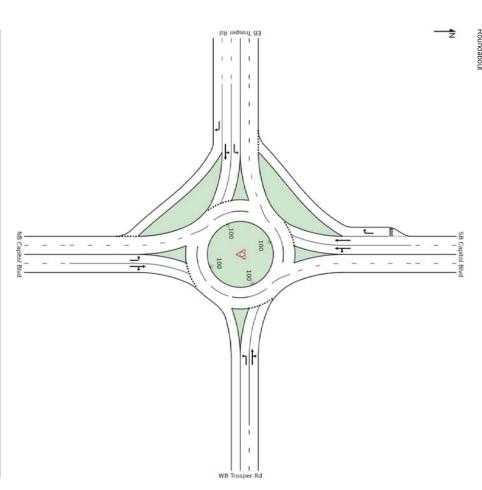
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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SITE LAYOUT

W Site: 33) Trosper Rd at Capitol Blvd

Projected 2040 With Improvements PM Peak Hour



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₩ Site: 33) Trosper Rd at Capitol Blvd

Projected 2040 With Improvements PM Peak Hour Roundabout

Deg Average Sah Level of Service 95% Back of Queue Vehicles Distance fit v/c sec Vehicles Distance fit 0.933 41.9 LOS D 15.0 380.4 0.944 41.0 LOS D 16.7 424.4 0.944 41.0 LOS D 16.7 424.4 0.944 41.4 LOS D 16.7 424.4 0.944 41.4 LOS D 16.7 424.4	Average Level of 95% Back of Delay Service Vehicles sec Veh 21.0 LOS D 15.0 41.0 LOS D 16.7 41.4 LOS D 16.7	Average Level of 95% Back of Queue Delay Service Vehides Distance sec veh ft 1.9 LOS D 15.0 380.4 41.0 LOS D 16.7 424.4 41.4 LOS D 16.7 424.4 41.4 LOS D 16.7 424.4
Level of 95% Back of Service Vehicles veh LOS D 15.0 LOS D 16.7 LOS D 16.7 LOS D 16.7	Level of 95% Back of Queue Service Vehicles Distance techniques 15.0 380.4 LOS D 16.7 424.4 LOS D 16.7 424.4 LOS D 16.7 424.4 LOS D 16.7 424.4	Level of 95% Back of Queue Stop Service Vehicles Distance Queued Stop veh the LOS D 15.0 380.4 1.00 LOS D 16.7 424.4 1.00
95% Back of Vehicles Veh 15.0 16.7 16.7 1.0	95% Back of Ousue Vehicles Distance veh 15.0 380.4 16.7 424.4 16.7 424.4 10.7 424.4 10.7 424.4	95% Back of Queue Prop. Effect Vehicles Distance Queued Stop veh ft Prop. Effect Stop veh ft Pro
	Oueue Distance th 380.4 424.4 424.4 424.4 424.4 424.4 424.4	Oueue Prop. Effective Prop. Effective Prop. Effective Prop. Effective Prop. Effective Prop. Prop. Effective Prop. Effective Prop. Effective Prop. Prop. Effective Prop. Effect
	Oueue Distance th 380.4 424.4 424.4 424.4 424.4 424.4 424.4	Oueue Prop. Effective Prop. Stop Distance Queued Stop Prop. 424.4 1.00 424.4
	Prop. Queued 1.00 1.00 1.00 1.00	Effec Stop pee

Level of Service (LOS) Method: Delay & vic (HCM 2010).

Roundabout LOS Method: Same as Signalised Intersections.

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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 M3D).

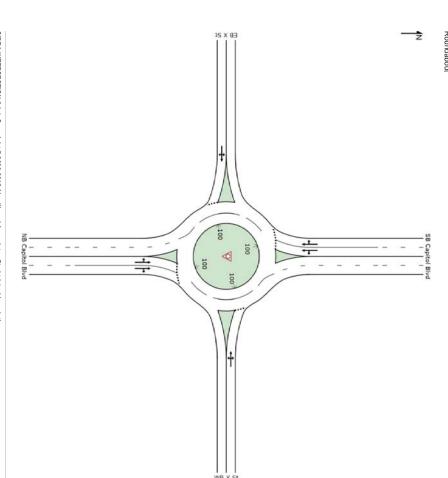
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation

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SITE LAYOUT

W Site: 38) X St at Capitol Blvd

Projected 2040 with Improvements PM Peak Hour Roundabout



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Organisation: SCJ. ALLIAUCE | Coreaded Wednesdy, February 10, 2016 105-555 Mt
Project: N:Projects/0825 City of Turnwater/0825.17 Turnwater Transportation Master Plan/Traffic/Operations/sidra/2040 With Imp/38) x St at Capitol Bivd.sip6

Y Site: 38) X St at Capitol Blvd

Projected 2040 with Improvements PM Peak Hour Roundabout

Level of Service (LOS) Method: Delay & vic (HCM 2010).

Roundabout LOS Method: Same as Signalised intersections.

Vehicle movement LOS values are based on average delay and vic ratio (degree of saturation) per movement Vehicle movement LOS values are based on average delay value (does not apply for approaches and intersection).

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

Roundabout Capacity Model: SIDRA Standard.

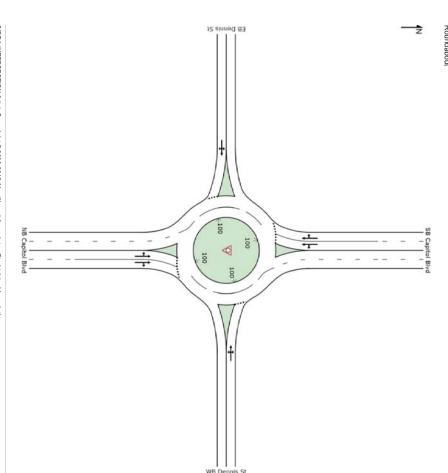
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies. Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Organisation: SC.JALLBANCE | Processed: Wednesday, February 17, 2016 311120 PM
Project: N.Projects/0625 City of Turmwater/0625.17 Turmwater/17 insportation Masser PlamTraffic/Operations/sidra2040 With Imp/38) X St at Capitol Bivd.sip6

SITE LAYOUT

W Site: 40) Dennis St at Capitol Blvd

Projected 2040 with Improvements PM Peak Hour Roundabout



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▼ Site: 40) Dennis St at Capitol Blvd

Projected 2040 with Improvements PM Peak Hour Roundabout

Movem	Movement Performance - Vehicles	ance - Veh	icles								
	OD Mov	Demand Flows	NH Swol:	Deg. Satn	Average Delav	Level of Service	95% Back of Queue Vehicles Distan	Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
					sec					per veh	
South: N	South: NB Capitol Blvd										
ω	L2	21	2.0	0.467	9.1	LOSA	3.5	89.4	0.68	0.54	33.1
00	71	921	2.0	0.467	8.7	LOSA	3.6	92.6	0.67	0.52	33.3
18	R2	42	2.0	0.467	8.4	LOSA	3.6	92.6	0.67	0.51	32.4
Approach	ň	984	2.0	0.467	8.7	LOSA	3.6	92.6	0.67	0.52	33.2
East: W	East: WB Dennis St										
_	F2	42	2.0	0.293	11.5	LOS B	1.3	33.6	0.74	0.74	31.4
6	71	26	2.0	0.293	11.5	LOS B	1.3	33.6	0.74	0.74	31.3
16	R2	79	2.0	0.293	11.5	LOSB	1.3	33.6	0.74	0.74	30.5
Approach	ř	147	2.0	0.293	11.5	LOSB	1.3	33.6	0.74	0.74	30.9
North: S	North: SB Capitol Blvd										
7	L2	47	2.0	0.466	7.6	LOSA	3.9	98.8	0.39	0.20	33.7
4	71	1053	2.0	0.466	7.4	LOSA	3.9	99.9	0.39	0.20	33.9
14	R2	132	2.0	0.466	7.2	LOSA	3.9	99.9	0.38	0.19	32.9
Approach	ň	1232	2.0	0.466	7.4	LOSA	3.9	99.9	0.39	0.20	33.8
West E	West EB Dennis St										
O	L2	237	2.0	0.562	17.1	LOSB	3.2	81.9	0.78	0.86	28.3
2	T1	42	2.0	0.562	17.1	LOS B	3.2	81.9	0.78	0.86	28.2
12	R2	37	2.0	0.562	17.1	LOS B	3.2	81.9	0.78	0.86	27.6
Approach	¥	316	2.0	0.562	17.1	LOS B	3.2	81.9	0.78	0.86	28.2
All Vehicles	des	2679	2.0	0.562	9.3	LOSA	3.9	99.9	0.56	0.42	32.6

Level of Service (LOS) Method: Delay & vic (HCM 2010).

Roundabout LOS Method: Same as Signalised intersections.

Vehicle movement LOS values are based on average delay and vic ratio (degree of saturation) per movement Vehicle movement LOS values are based on average delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (vic not used as specified in HCM 2010). Roundabout Capacity Model: SIDRA Standard.

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

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Project: N:Projects/0625 City of Turmwater/0625.17 Turmwater Transportation Master Plan/Traffic/Operations/sidra/2040 With Imp/40) Dennis St at Capitol
Bivd.s/p6

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

Projected 2040 with Imp PM Peak Hour

		×	×	7	,	,	•	•				
Lane Group	SEL	SET	SER	NWL	TWN	NWR	NEL	NET	NER	SWL	SWT	
Lane Configurations	_#	¥		JI.	¥		_#	¥		_1	→	
Traffic Volume (vph)	5	25	10	100	50	25	15	275	50	25	535	
Future Volume (vph)	5	25	10	100	50	25	15	275	50	25	535	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	0		0	175		0	100		
Storage Lanes			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)		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%	2%	1%	1%	2%	2%	1%	
Shared Lane Traffic (%)												
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4		ω	œ		_	6		5	2	
Permitted Phases												
Detector Phase	7	4		ω	00		_	6		5	2	
Switch Phase												
Minimum Initial (s)	4.0	7.0		4.0	7.0		4.0	7.0		4.0	7.0	
Minimum Split (s)	8.5	24.5		8.5	27.5		8.5	24.5		8.5	27.5	27.5
Total Split (s)	8.5	25.0		11.0	27.5		8.5	29.1		9.9	30.5	
Total Split (%)	11.3%	33.3%		14.7%	36.7%		11.3%	38.8%		13.2%	40.7%	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	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 Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	Max		None	None		None	Max		None	None	None
Intersection Summary												
Area Type:	Other											
Cycle Length: 75												
Cycle Leight 10												
Actuated Cycle Length: 67.1	- 3											

Splits and Phases:

56: Littlerock Rd & Black Hills School Drwy

ø Ø2 49⁽ **₹** Ø3

√ 94

ø5

SCJ Alliance Tumwater Transportation Master Plan

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

Projected 2040 with Imp

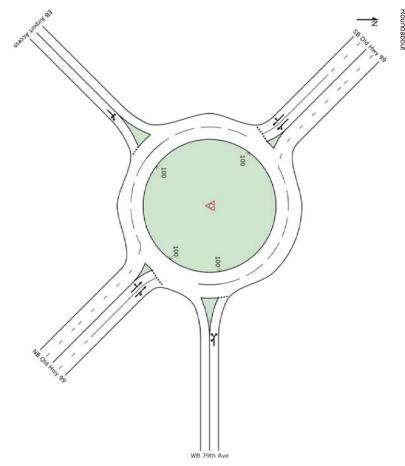
	i		-		r	ı,	,					1
	4	K	*_	7	×	a	4	×	١	F	×	ť
Movement	SEL	SET	SER	NWL	TWN	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations	_#	❖		_#	¥		_H	₽÷		_#	→	-4
Traffic Volume (veh/h)	5	25	10	100	50	25	15	275	50	25	535	70
Future volume (vervn)	1 Ω	, Z	1 =	200	٥٥	10	² 2	2/5	16	л С	335	13 0
Initial O (Oh) veh	o ~	o 4	0 4	o د	> 0	0 0	o -	> 0	o	0	0 1	o =
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1874	1900	1863	1863	1900	1881	1878	1900	1863	1881	1881
Adj Flow Rate, veh/h	5	26	=	105	53	26	16	289	53	26	563	74
Adj No. of Lanes	_	_	0	_	_	0	_	_	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	2	2	2	2	2	_	_	_	2	_	_
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), veh/h	5	0	37	105	0	79	16	0	342	26	563	74
Grp Sat Flow(s), veh/h/ln	1810	0	1780	1774	0	1760	1792	0	1828	1774	1881	1599
Q Serve(g_s), s	0.2	0.0	=======================================	4.1	0.0	2.3	0.6	0.0	10.4	1.0	19.2	2.2
Cycle Q Clear(g_c), s	0.2	0.0	3 -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	34.7	1.00
V/C Patio(X)	0 4/	000	0 07	0.78	000	0 14	0 58	9	043	0 45	0 83	012
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(I)	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 (d2), s/veh	0.2	0.0	0.3	17.7	0.0	0.1	7.1	0.0	.Ω 1	16.0	8.5	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
%IIe BackUtU(50%),ven/In	3	0.0	0.6	2.6	0.0	1 -	0.4	0.0	2 .0	0.7	3 =	1
InGra LOS	n :	Ċ	D :	J	Ċ	æ :	J :	ć	0	J	0.	B 1
Approach Vol, veh/h		42			184			358			663	
Approach Delay, s/veh		19.7			35.7			22.1			28.3	
Approach LOS		В			D			С			С	
Timer	_	2	ω	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.6	29.6	9.8	25.0	6.1	29.1	8.3	26.5				
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	26.0	6.5	20.5	5.4	24.6	4.0	23.0				
Max Q Clear Time (g_c+l1), s	2.6	21.2	6.1	3.1	3.0		2.2	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			27.4									
HCM 2010 LOS			C									

Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/13/2016

SITE LAYOUT

Site: 59) 79th Ave at Old Hwy 99
Projected 2040 with Improvements
PM Peak Hour
Roundabout



SIDRA INTERSECTION 6.1 | Copyright © 2000-2015 Akcelik and Associates Pty Ltd | sidrasolutions.com Organisation. SCI ALLIANCE | Created: Wednesday, February 17, 2016 3:14:27 PM Project. N.Projects/0625 City of Tumwater/0625.17 Tumwater Transportation Master Plan/Traffic/Operations/sidra/2040 With Imp/59) 79th Ave at Old Hwy 99.sip6

W Site: 59) 79th Ave at Old Hwy 99

Projected 2040 with Improvements PM Peak Hour Roundabout

Moven	nent Perfo	Movement Performance - Vehicles Demand Flows	hicles Flows	Deg.	Average	Level of	95% Back of		Queue	Prop.	Prop.
ō	Mov	Total veh/h		Sath V/c	Delay sec	Service		Vehicles veh	Vehicles Distance the second s	Distance Queued	Distance
SouthE	SouthEast: NB Old Hwy 99	Hwy 99									
3x	L2	_	1.0	0.272	5.4	LOSA		1.7	1.7 41.8		41.8
8 X	7	679	1.0	0.272	5.2	LOSA		1.7	1.7 42.3		42.3
18bx	R3	21	1.0	0.272	5.0	LOSA		1.7	1.7 42.3		42.3
Approach	sh	701	1.0	0.272	5.2	LOSA		1.7		1.7	1.7 42.3
East: W	East: WB 79th Ave										
16	L3	32	1.0	0.224	7.5	LOSA	≻	A 0.9		0.9	0.9 23.0
à	7	_	1.0	0.224	7.5	LOSA	⊳	A 0.9		0.9	0.9 23.0
16a	R1	132	1.0	0.224	7.5	LOSA	⋗	A 0.9		0.9	0.9 23.0
Approach	Sh	164	1.0	0.224	7.5	LOSA	⊳	A 0.9		0.9	0.9 23.0
NorthW	NorthWest: SB Old Hwy 99	Hwy 99									
7ax	ニ	137	1.0	0.588	9.3	LOSA	⊳	A 6.4		6.4	6.4 160.8
4×	7	1526	1.0	0.588	9.0	LOSA	⋗	A 6.4		6.4	6.4 161.3
14x	R2	_	1.0	0.588	8.9	LOSA	≻	A 6.4		6.4	6.4 161.3
Approach	sh	1664	1.0	0.588	9.1	LOSA	≻	A 6.4		6.4	6.4 161.3
SouthW	SouthWest: EB Airport Access	ort Access									
5×	L2	_	2.0	0.027	8.1	LOSA	⊳	A 0.1		0.1	0.1 2.6
12ax	R1	_	2.0	0.027	8.1	LOSA	Þ	Φ 0.1		0.1	0.1 2.6
12x	R2	3	2.0	0.027	8.1	LOSA		0.1		0.1	0.1 2.6
Approach	Sh	13	2.0	0.027	8.1	LOSA		0.1		0.1	0.1 2.6
	>				4						

Level of Service (LOS) Method: Delay & vic (HCM 2010).

Roundabout LOS Method: Same as Signalised intersections.

Vehicle movement LOS values are based on average delay and vic ratio (degree of saturation) per movement Vehicle movement LOS values are based on average delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (vic 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 M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

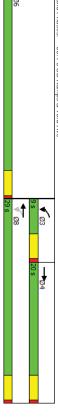
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Organisation: SCLALLIANCE | Processed: Wednesday, February 17, 2016; 3:14.11 PM
Project. N:Projects/0625 City of Turnwaler/0625.17 Turnwaler Transportation Master PlanTrafficOperations/sidra/2040 With Imp/59) 79th Ave at Old Hwy
99.sip6

Lanes, Volumes, Timings 63: I-5 SB Ramps & 93rd Ave

Projected 2040 with Imp

Actuate		Cycle L	Area Type:	Interse	Recall Mode	Lead-L	Lead/Lag	Total L	Lost Tir	All-Red	Yellow	Total S	Total Split (s)	Minimu	Minimu	Switch	Detecto	Permitt	Protect	Turn Type	Shared	Heavy	Peak H	Travel	Link Di	Link Sp	Right T	Taper L	Storage	Storage	Ideal FI	Future	Traffic '	Lane C	Lane Group	
Natural Ovole: 55	Actuated Cycle Length: 55.5	ength: 6	/pe:	tersection Summary	Mode	_ead-Lag Optimize?	ag	otal Lost Time (s)	ost Time Adjust (s.	VII-Red Time (s)	Yellow Time (s)	plit (%)	plit (s)	/linimum Split (s)	Ninimum Initial (s)	witch Phase	etector Phase	Permitted Phases	rotected Phases	/pe	hared Lane Traffic (%)	leavy Vehicles (%)	eak Hour Factor	ravel Time (s)	Link Distance (ft)	eed (mp	Right Turn on Red	aper Length (ft)	itorage Lanes	storage Length (ft)	deal Flow (vphpl)	uture Volume (vph)	raffic Volume (vph)	ane Configurations	roup	
Ğ	Length:	ō		nmary		nize?		(s)	st (s)					s)	(s)			es	es		affic (%)	(%)	or		J	ž	ed	T)		∄	밀	(vph)	(vph)	tions		
	55.5		Other																		_															
			er er																			1%	0.95					25	0	0	1900	0	0		EBL	-
					None	Yes	Lag	4.0	0.0	0.5	3.5	33.3%	20.0	20.0	4.0		4		4	NA		1%	0.95	16.6	732	30					1900	415	415	∌	EBT	ţ
																						1%	0.95				Yes		0	0	1900	95	95		EBR	1
					None	Yes	Lead	4.0	0.0	0.5	3.5	15.0%	9.0	8.0	4.0		ω	œ	ω	pm+pt		9%	0.95					25	_	150	1900	85	89	JI.	WBL	4
					None			4.0	0.0	0.5	3.5	48.3%	29.0	20.0	4.0		00		00	NA		9%	0.95	16.0	936	40					1900	305	305	\$	WBT	†
																						9%	0.95				Yes		0	0	1900	0	0		WBR	1
																						0%	0.95					25	0	0	1900	0	0		NBL	۶
																						0%	0.95	25.0	1099	30					1900	0	0		NBT	→
																						0%	0.95				Yes		0	0	1900	0	0		NBR	•
					Max					0.5	3.5	51.7%	31.0	20.0	4.0		6	6		Perm		4%	0.95					25	0	0	1900	475	475		SBL	•
					Max			4.0	0.0	0.5	3.5	51.7%	31.0	20.0	4.0		6		6	NA		4%	0.95	37.4	1644	30					1900	0	0	2 ,	SBT	•
					Max			4.0	0.0	0.5	3.5	51.7%	31.0	20.0	4.0		6	6		Perm		4%	0.95				Yes		_	300	1900	425	425	٦,	SBR	•

Splits and Phases: 63: I-5 SB Ramps & 93rd Ave Control Type: Actuated-Uncoordinated



SCJ Alliance Tumwater Transportation Master Plan

HCM 2010 Signalized Intersection Summary 63: I-5 SB Ramps & 93rd Ave

Projected 2040 with Imp PM Peak Hour

	1	ţ	1	1	†	1	۶	→	*	•	+	•
Novement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
ane Configurations	,	₹	2)	3	,	,	,	,	i	4	_
raffic Volume (veh/h)	0	415	S S	р Ж	305	0	0	0	0	475	0	425
dimber	7 0	A -	14	یہ 5	ω C	1 20 c	c	c	c	1	> 0	16
nitial O (Ob), veh	o •	o 4	0 1	0 0	0 0	0 6				o -	> 0	3 0
ed-Bike Adj(A_pbT)	1.00	4	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/h/ln	0	1881	1900	1743	1743	0				1900	1827	1827
4dj Flow Rate, veh/h	0	437	100	89	321	0				500	0	268
Adj No. of Lanes	0	2	0	_	2	0				0	_	_
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	_	_	9	9	0				4	4	4
Cap, veh/h	0	657	149	296	1180	0				864	0	771
Arrive On Green	0.00	0.23	0.23	0.06	0.36	0.00				0.50	0.00	0.50
Sat Flow, veh/h	0	2989	657	1660	3399	0				1740	0	1553
3rp Volume(v), veh/h	0	268	269	89	321	0				500	0	268
3rp Sat Flow(s),veh/h/ln	0	1787	1765	1660	1656	0				1740	0	1553
Σerve(g_s), s	0.0	7.4	7.5	2.1	3.8	0.0				11.0	0.0	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
op In Lane	0.00		0.37	1.00		0.00				1.00		1.00
ane Grp Cap(c), veh/h	0	405	400	296	1180	0				864	0	771
//C Ratio(X)	0.00	0.66	0.6/	0.30	0.27	0.00				0.58	0.00	0.35
4ναιι Caρ(τ_a), veππ 4CM Platoon Ratio	3	100	100	100	100	100				1 00	100	1 2
Jpstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Jniform Delay (d), s/veh	0.0	19.1	19.2	14.2	12.5	0.0				9.7	0.0	8.3
ncr Delay (dŹ), s/veh	0.0	2.0	2.2	0.6	0.1	0.0				2.8	0.0	1.2
nitial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.9	3.9	1.0	1.7	0.0				6.0	0.0	2.6
_nGrp Delay(d),s/veh	0.0	21.1	21.4	14.8	12.6	0.0				12.5	0.0	9.6
_nGrp LOS		C	C	В	В					В		,
Approach Vol, veh/h		537			410						768	
Approach Delay, s/veh		21.2			13.1						11.5	
\pproach LOS		С			В						В	
Timer		2	ω	4	5	6	7	8				
Assigned Phs			ω	4		6		8				
hs Duration (G+Y+Rc), s			7.0	16.3		31.0		23.4				
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 (g_c+I1), s			4.1	9.5		13.0		5.8				
Green Ext Time (p_c), s			0.0	2.8		3.7		5.2				
ntersection Summary												
HCM 2010 Ctrl Delay			14.9									
LOM 2010 LOS			J									

Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

Lanes, Volumes, Timings 64: I-5 NB Ramps & 93rd Ave

Projected 2040 with Imp
PM Peak Hour

,	ļ	/	١	1	1	۰	-	*	•	-	•
E	EBT	EBR •	WBL •	WBT	WBR	NBL .	NBT -	NBR -	SBL	SBT	SBR
J.	‡			⇉	٦,		ž,	٦,			
290	555	0	0	290	425	130	0	155	0	0	0
290	555	0	0	290	425	130	0	155	0	0	0
1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
125		0	0		300	0		200	0		0
_		0	0		_	0		_	0		0
25			25			25			25		
		Yes			Yes			Yes			Yes
	40			40			30			30	
	936			1635			1212			341	
	16.0			27.9			27.5			7.8	
0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
3%	3%	3%	8%	8%	8%	14%	14%	14%	0%	0%	0%
Prot	NA			NA	Perm	Perm	NA	Perm			
7	4			00			2				
					8	2		2			
7	4			00	00	2	2	2			
	4.0			4.0	4.0	4.0		4.0			
	20.0			20.0	20.0	20.0		20.0			
	39.0			20.0				21.0			
	65.0%			33.3%				35.0%			
	3.5			3.5				3.5			
	0.5			0.5				0.5			
	0.0			0.0	0.0			0.0			
	4.0			4.0	4.0			4.0			
Lead				Lag	Lag						
Yes				Yes	Yes						
None	None			None	None	Min	Min	Min			
Other											
ordinatod											
	Lane Group Lane Configurations Tradic Volume (vph) 290 Future Volume (vph) Storage Length (t) Taper Length (t) Link Distance (t) Link Distance (t) Link Distance (t) Link Distance (t) Frak Hour Factor Peak Hour Factor Peak Hour Factor Peak Hour Factor Peam Hide Phases Protected Phases Othernited Spitt (s) 10,00 Total Spitt (s) Total		EBT 1900 1 1900	EBT EBR V 555 0 1900 1900 1 700 1900 1 100 1900 1 100 100 1 100 1	EBT EBR WBL ↑↑ ↑↑ ↑↑ ↑↑ ↑↑ ↑↑ ↑↑ ↑↑ ↑↑ ↑↑ ↑↑ ↑↑ ↑	EBI EBR WBL WBI WBR ↑↑ ↑↑ ↑↑ ↑↑ ↑↑ ↑↑ ↑↑ ↑↑ ↑↑ ↑↑ ↑↑ ↑↑ ↑	EBI EBR WBI WBI WBR NBL ↑↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑	EBI EBR WBI WBI WBR NBL NBI ↑↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑	EBI EBR WBL WBI WBR NBL NBI NBT NBL NBI NBT NBL NBI NBT NBL NBI NBT NBL NBI	EBI EBR WBL WBT WBR NBL NBT NBR 15555 0 290 425 130 0 155 555 0 0 290 425 130 0 1900 1900 1900 1900 1900 1900 190	EBI EBR WBL WBI WBR NBL NBI NBR SBL MA

Tumwater Transportation Master Plan SCJ Alliance

Splits and Phases: 64: I-5 NB Ramps & 93rd Ave

07 **-**Ø4

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HCM 2010 Signalized Intersection Summary 64: I-5 NB Ramps & 93rd Ave

Projected 2040 with Imp PM Peak Hour

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	-	ţ	1	1	†	1	۶	→	*	•	—	•
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	_#	⇉			\$	-4		Ž,	-14			
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	ω	00	18	ۍ ت	2	12			
Initial Q (Qb), veh	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			
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/h/ln	1845	1845	0	0	1759	1759	1900	1667	1667			
Adj Flow Rate, veh/h	305	584	0	0	305	0	137	0	0			
Adj No. of Lanes	_	2	0	0	2	_	0	_	_			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	ω	ω	0	0	00	œ	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), veh/h	305	584	0	0	305	0	137	0	0			
Grp Sat Flow(s), veh/h/ln	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	2	0.00	0.00	150	7.00	1.00	>	1.00			
VIC Patio(Y)	0 77	0 27	3 0	000	0 25 0	000	240	3 0	000			
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(I)	1.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh	12.2	3.1	0.0	0.0	10.0	0.0	13.1	0.0	0.0			
Incr Delay (d2), s/veh	3.2	0.1	0.0	0.0	0.2	0.0	2.0	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			
%ile BackOlQ(50%),ven/in	3.0	ر د د	0.0	0.0	10.2	0.0	15 1	0.0	0.0			
InGrn I OS	D :	D i	Ċ		D :		D -	ć				
Approach Vol. veh/h		889			305			137				
Approach Delay, s/veh		7.4			10.3			15.1				
Approach LOS		A			В			В				
Timer	_	2	ω	4	5	6	7	8				
Assigned Phs		2		4			7	&				
Phs Duration (G+Y+Rc), s		9.2		24.3			11.5	12.8				
Change Period (Y+Rc), s		4.0		4.0			4.0	4.0				
Max Green Setting (Gmax), s		17.0		35.0			15.0	16.0				
Max Q Clear Time (g_c+l1), s		4.7		4.6			7.5	4.5				
Green Ext Time (p_c), s		0.5		6.3			0.5	4.3				
Intersection Summary												
HCM 2010 Ctrl Delay			8.8									
HCM 2010 LOS			Α									

Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

Lanes, Volumes, Timings 65: Kimmie St & 93rd Ave

Projected 2040 with Imp

	-	ţ	4	1	†	1	۶	→	•	•	←	•
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	J.	¥		_#	↑		JI.	¥		_#	₹	
Traffic Volume (vph)	55	535	5	5	475	15	15	_	10	30	15	110
Future Volume (vph)	55	535	5	5	475	15	15		10	30	15	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	100		250	100		0	100		0
Storage Lanes	_		0	_		_	_		0	_		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		40			40			30			30	
Link Distance (ft)		1635			3676			860			5320	
Travel Time (s)		27.9			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 (%)												
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		ω	00		5	2		_	6	
Permitted Phases												
Detector Phase	7	4		ω	00		5	2		_	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (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			21.5			23.0	
Total Split (%)	14.4%	50.0%			46.3%			26.9%			28.8%	
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	
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			Lag			Lag			Lag	
Lead-Lag Optimize?	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	ordinated											
Callife and Dhases: 45. Kin	KE: Kimmio Ct 9, Dord Avo	Oord Avo										
	9	,010	-	١								

Tumwater Transportation Master Plan SCJ Alliance

906

8.5 s 07

<u>†</u>

HCM 2010 Signalized Intersection Summary 65: Kimmie St & 93rd Ave

Projected 2040 with Imp PM Peak Hour

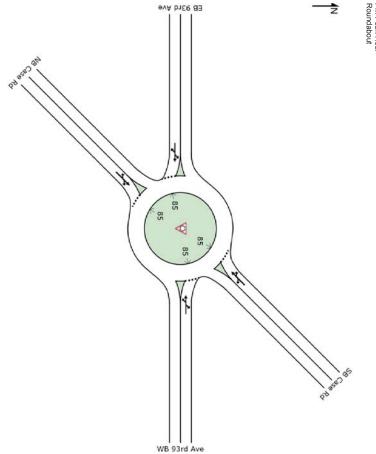
	-	Ļ	1	1	†	1	٠	→	*	•	—	4
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	_71	₽÷		JI.	₩		J,	₽		JI.	₽ ⁾	
Traffic Volume (veh/h)	55	535	5	5	475	15	15	٦,	10	30	15	110
Future Volume (veh/h)	55	535	5	5	475	15	15	_	10	30	15	110
Number	7	4	14	ω	00	18	5	2	12	_	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1827	1827	1900	1881	1881	1900	1900	1900	1900	1810	1810	1900
Adj Flow Rate, veh/h	58	563	σı	σ,	500	16	16	_	=======================================	32	16	116
Adj No. of Lanes	_	_	0	_	2	0	_	_	0	_	_	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	_	_	_	0	0	0	5	5	ر ت
Cap, veh/h	8 8	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, ven/h	1/40	8081	16	1/92	3535	113	0181	136	1499	1/23	061	13//
Grp Volume(v), veh/h	2 2	0	568	5	252	264	16	0	1/25	32	0	132
Grp Sat Flow(s), ven/ivin	1,40	000	11/4	1/92	1/8/	1861	0 0	000	1635	1/23	0 0	106/
Cycle O Clear(n.c) s	л :	0.0	11.4	0 .	4.4	Д 4 Л С	0.4	0.0	0.0	0.0	0.0	2 0.0
Pron In I and	3 :		0 - 1	100	1	0.06	100	ċ	0.90	1 00		0 88
Lane Grp Cap(c), veh/h	88	0	810	10	722	752	29	0	202	50	0	214
V/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(I)	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	27.7	0.0	18.4
Inci Delay (dz), siven	0.9	0.0	2 -	37.0	0.3	0.3	0.1	0.0	0 .	12.4	0.0	2.4
%ile BackOfO(50%) veh/ln	10	0.0	л с	0.0	2 2	ر د د	0 0	0.0	0.0	0.6	0.0	17
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		В	ш	Þ	⊳	D		В	C		C
Approach Vol, veh/h		626			521			28			164	
Approach Delay, s/veh		13.3			10.1			28.8			23.8	
Approach LOS		В			В			С			С	
Timer	_	2	ω	4	5	6	7	œ				
Assigned Phs	1	2	S	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.8	10.1	4.7	24.6	5.2	10.7	6.6	22.8				
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	5.5	17.0	4.0	35.5	4.0	18.5	7.0	32.5				
Max Q Clear Time (g_c+l1), s	2.8	2.3	2.1	13.4	2.4	5.6	3.5	6.5				
Green Ext Time (p_c), s	0.0	0.6	0.0	6.7	0.0	0.6	0.0	7.1				
Intersection Summary												
HCM 2010 Ctrl Delay			13.7									
HCM 2010 LOS			В									

Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

SITE LAYOUT

Site: 66) Case Rd at 93rd Ave
Projected 2040 With Improvements
PM Peak Hour
Roundabout



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Organisation: SCJ ALLANCE | Created: Wednesday February 17, 2016 3:18:58 PM
Project: NAProjects/0625 City of Tumwater/0525.17 Tumwater Transportation Master Plan/Traffic/Operations/sidra/2040 With Imp/66) 93rd Ave at Case Rd. sip6

W Site: 66) Case Rd at 93rd Ave

Projected 2040 With Improvements PM Peak Hour Roundabout

Movem	Movement Performance - Vehicles	ance - Veh	icles								
ΞŌγ	OD Mov	Demand Flows Total HV	NH Swol:	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehides Distan	· Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h			sec		veh			per veh	
East: WE	East: WB 93rd Ave										
à		253	2.0	0.659	13.0	LOSB	7.1	179.9	0.66	0.42	30.1
6	T1	379	2.0	0.659	13.0	LOSB	7.1	179.9	0.66	0.42	30.4
16b	R3	68	2.0	0.659	13.0	LOSB	7.1	179.9	0.66	0.42	29.4
Approach	ъ	700	2.0	0.659	13.0	LOSB	7.1	179.9	0.66	0.42	30.2
NorthEa	NorthEast: SB Case Rd	<u>.</u>									
1bx	L3	147	2.0	0.407	12.4	LOSB	2.9	72.4	0.85	0.85	30.0
6x	T1	84	2.0	0.407	12.4	LOSB	2.9	72.4	0.85	0.85	29.8
16ax	R1	OI	2.0	0.407	12.4	LOSB	2.9	72.4	0.85	0.85	29.6
Approach	ד	237	2.0	0.407	12.4	LOS B	2.9	72.4	0.85	0.85	29.9
West E	West EB 93rd Ave										
5a	7	OI	2.0	0.789	23.7	LOSC	11.1	282.6	0.98	1.14	26.7
2	T1	458	2.0	0.789	23.7	LOSC	11.1	282.6	0.98	1.14	27.0
12b	R3	147	2.0	0.789	23.7	LOSC	11.1	282.6	0.98	1.14	26.2
Approach	ъ	611	2.0	0.789	23.7	LOSC	11.1	282.6	0.98	1.14	26.8
SouthWe	SouthWest: NB Case Rd	ď									
5bx	L3	89	2.0	0.280	9.2	LOSA	1.8	45.8	0.78	0.71	31.6
2 x	T1	37	2.0	0.280	9.2	LOSA	1.8	45.8	0.78	0.71	31.4
12ax	R1	53	2.0	0.280	9.2	LOSA	1.8	45.8	0.78	0.71	31.2
Approach	ъ	179	2.0	0.280	9.2	LOSA	1.8	45.8	0.78	0.71	31.4
All Vehicles	les	1726	2.0	0.789	16.3	LOSB	11.1	282.6	0.81	0.76	29.0

Level of Service (LOS) Method: Delay & vic (HCM 2010).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay and vic ratio (degree of saturation) per movement LOS relues are based on average delay and vic ratio (degree of saturation) per movement LOS F will respective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (vic not used as specified in HCM 2010). Roundabout Capacity Model: SIDRA Standard.

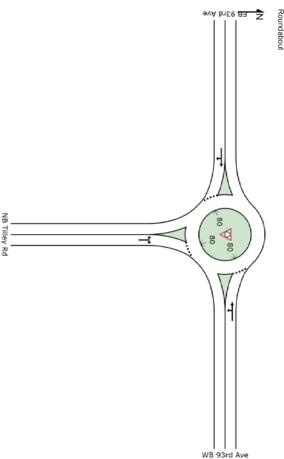
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies Gap-Acceptance Capacity. SIDRA Standard (Akçelik M3D). HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Organisation: SCJALLIANCE | Processed: Wednesday, February 17, 2016 3.1852 PM
Project: N.Projects/6525 CNy of Tumwater/6525.17 Tumwater Transportation Master PlaniTraffic/Operations/sidra/2040 With Imp/66) 93rd Ave at Case Rd sip6

SITE LAYOUT

▼ Site: 67) 93rd Ave at Tilley Rd (South)

Projected 2040 with Improvements



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♥ Site: 67) 93rd Ave at Tilley Rd (South)

Projected 2040 with Improvements Roundabout

Movem	Movement Performance - Vehicles	ance - Ve	hicles								
Mov	OD	Demand Flows	Flows	Deg.	Average	Level of	95% Back of Queue	f Queue	Prop.	Effective	Average
				Satn	Delay				Queued	Stop Rate	Speed
										per veh	
South: N	South: NB Tilley Rd										
ω	L2	179	2.0	0.345	8.8	LOSA	2.3	58.9	0.71	0.60	31.2
18	R2	89	2.0	0.345	8.8	LOSA	2.3	58.9	0.71	0.60	30.5
Approach	ä	268	2.0	0.345	8.8	LOSA	2.3	58.9	0.71	0.60	31.0
East: W	East: WB 93rd Ave										
_	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	ä	789	2.0	0.788	19.4	LOSB	12.0	305.6	0.89	0.70	27.8
West: El	West: EB 93rd Ave										
2	7	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	LOSB	9.5	241.7	0.90	0.82	28.3
Approach	ä	653	2.0	0.732	17.9	LOSB	9.5	241.7	0.90	0.82	28.7
All Vehicles	des	1711	2.0	0.788	17.2	LOSB	12.0	305.6	0.86	0.73	28.6

Level of Service (LOS) Method: Delay & vic (HOM 2010).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay and vic ratio (degree of saturation) per movement vehicle movement class of a wind possible of the process and intersection).

LOS F will result if vic > 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 (vic 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

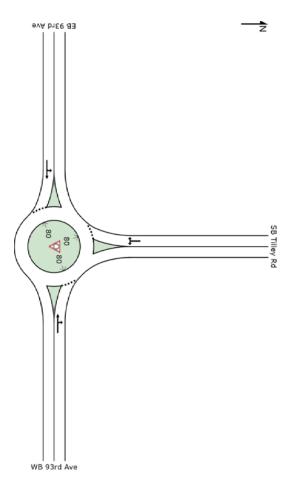
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation

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SITE LAYOUT

Site: 68) 93rd Ave at Tilley Rd (Notth)

Projected 2040 with Improvements Roundabout



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Organisation: SCJ ALLIANCE | Created: Thursday, February 25, 2016 12-42;04 PM
Project: NIProjects\0625 City of Tumwater\0625.17 Tumwater Transportation Master Plan\Traffic\00000perations\sidra\2040 With Imp\68) 93rd Ave at Tilley Rd
(North).sip6

₩ Site: 68) 93rd Ave at Tilley Rd (Notth)

Projected 2040 with Improvements Roundabout

Mov	OD	Demand Flows	Flows	Deg.	Average	Level of	95% Back of Queue	of Queue	Prop.	Effective	Average
		Total	, H	Sath	Delay		Vehicles	Distance	Queued	Stop Rate	Speed
East: Wi	East: WB 93rd Ave										
6	7	358	2.0	0.398	7.6	LOSA	2.9	74.5	0.44	0.26	33.4
16	R2	68	2.0	0.398	7.6	LOSA	2.9	74.5	0.44	0.26	32.5
Approach	ä	426	2.0	0.398	7.6	LOSA	2.9	74.5	0.44	0.26	33.2
North: S	North: SB Tilley Rd										
7	L2	179	2.0	0.712	17.4	LOS B	8.5	215.1	0.87	0.87	28.4
14	R2	432	2.0	0.712	17.4	LOSB	8.5	215.1	0.87	0.87	27.9
Approach	ä	611	2.0	0.712	17.4	LOSB	8.5	215.1	0.87	0.87	28.0
West: El	West: EB 93rd Ave										
5	L2	121	2.0	0.503	9.7	LOSA	4.2	106.7	0.61	0.42	31.7
2	⇉	379	2.0	0.503	9.7	LOSA	4.2	106.7	0.61	0.42	31.8
Approach	ä	500	2.0	0.503	9.7	LOSA	4.2	106.7	0.61	0.42	31.8
All Vehicles	les	1537	2.0	0.712	12.2	LOSB	8.5	215.1	0.67	0.55	30.5

Level of Service (LOS) Method: Delay & vic (HCM 2010).

Roundabout LOS Method: Same as Signalised Intersections.

Pehide movement LOS values are based on average delay and v/cratio (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.

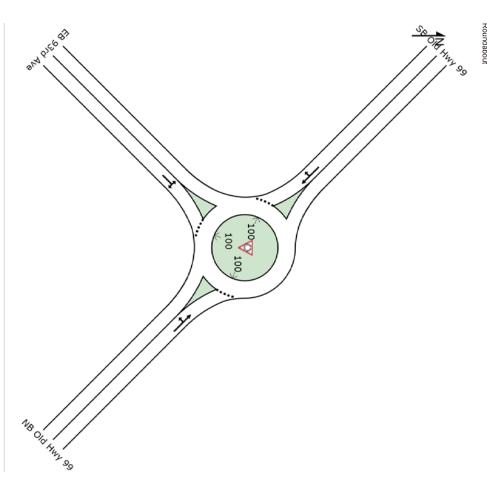
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies. Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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SITE LAYOUT

W Site: 69) 93rd Ave at Old Hwy 99

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\000000perations\sidra\2040 With Imp\69) 93rd Ave at Old Hwy
99.slp6

W Site: 69) 93rd Ave at Old Hwy 99

Projected 2040 With Improvements PM Peak Hour Roundabout

Movemo	Movement Performance - Vehicles	ance - Veh	iicles								
Mov	OD	Demand Flows	-lows	Deg.	Average	Level of	95% Back of Queue	Queue	Prop.	Effective	Average
ō				Satn	Delay				Queued		Speed
										per veh	
SouthEas	SouthEast: NB Old Hwy 99	y 99									
3x	L2	200	2.0	0.447	7.4	LOSA	4.3	109.6	0.18	0.05	33.1
8x	7	358	2.0	0.447	7.4	LOSA	4.3	109.6	0.18	0.05	33.0
Approach	5	558	2.0	0.447	7.4	LOSA	4.3	109.6	0.18	0.05	33.0
NorthWe	NorthWest: SB Old Hwy 99	y 99									
4×	7	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	5	968	2.0	0.922	32.1	LOSC	24.0	608.9	1.00	0.96	24.8
SouthWe	SouthWest: EB 93rd Ave	/e									
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	ъ	232	2.0	0.623	27.5	LOSC	5.9	150.0	1.00	1.13	25.3
All Vehicles	les	1758	2.0	0.922	23.7	LOSC	24.0	608.9	0.74	0.69	27.0
Level of S	Level of Service (LOS) Method: Delay & v/c (HCM 2010)	Method: De	lav & v/c	(HCM 2010)							

Level of Service (LOS) Method: Delay & Wc (HCM, 2010).

Roundabout LOS Method: Same as Signalised intersections.

Vehide movement LOS values are based on average delay and v/cratio (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).

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 M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: NProjects/0625 City of Turnwaler/0625.17 Turnwaler Transportation Master PlanTraffic/Operations/sidra/2040 With Imp/69) 93rd Ave at Old Hwy
99.sip6

1: RW Johnson Rd & Mottman Rd

Projected 2022 without improvements
PM Peak Hour

Illelaction												
Intersection Delay, s/veh	12.6											
Intersection LOS	В											
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	
Traffic Vol, veh/h	0	45	85	5	0	120	45	85	0	5	175	
Future Vol, veh/h	0	45	85	5	0	120	45	85	0	5	175	
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	92	5	0	130	49	92	0	5	190	
Number of Lanes	0	_	_	0	0	_	_	0	0	_	_	
Annroach	ı	F	ı	ı	ı	WR.	ı	ı	ı	S S	ı	
Opposing Approach		WR				F				SR		
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		
ICM FOO		c				c				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		57	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			
		0.009	2 2 2	0.098	0.182	0.254	0.238	0.094	0.247			
HCM Lane V/C Ratio		9.5	0.00		10.9	100	10.7	10.4	11.1			
HCM Lane V/C Ratio HCM Control Delay			15.5	10.7		2.2		,	ם			
HCM Lane V/C Ratio HCM Control Delay HCM Lane LOS		Þ	15.5 C	10.7 B	В	B	В	В	C			

SCJ Alliance Tumwater Transportation Master Plan Synchro 9 Report

6/10/2016

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	ω	ω	ω
Mvmt Flow	0	49	120	22
Number of Lanes	0	_	_	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		В		
Lane				

Synchro 9 Report 6/10/2016

Tumwater Transportation Master Plan SCJ Alliance

Lanes, Volumes, Timings
2: Crosby Blvd & Mottman Rd

Projected 2022 without improvements

PM Peak Hour

Cyber Englin: 100 Actualed Cycle Length: 100 Actualed Cycle Length: 100 Offset 82 (82%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow Natural Cycle: 55 Control Type: Actuated-Coordinated	velo I conth	ntersection Summan	Recall Mode	_ead-Lag Optimize?	ead/Lag	otal Lost Time (s)	ost Time Adjust (s)	All-Red Time (s)	ellow Time (s)	「otal Split (%)	otal Split (s)	/linimum Split (s)	/linimum Initial (s	Switch Phase	Detector Phase	Permitted Phases	Protected Phases	Turn Type	Shared Lane Traffic	leavy Vehicles (%)	eak Hour Factor	ravel Time (s)	ink Distance (ft)	ink Speed (mph)	Right Turn on Red	aper Length (ft)	Storage Lanes	Storage Length (ft)	deal Flow (vphpl)	-uture Volume (vph)	raffic Volume (vph)	ane Configurations	ane Group	
le Length: 10%), Referen : 55 Actuated-Co	100	ummary		timize?	1	ne (s)	lust (s)	(s)	(S)	_		t(s)	al (s)		se	ases	ases		Traffic (%)	es (%)	ctor	s)	∄	nph)	Red	(∄	S	th (ft)	ohpl)	e (vph)	e (vph)	rations		
)() ced to phase cordinated	Other		None			4.5	0.0	1.0	3.5	39.0%	39.0	20.5	4.0		4	4		Perm		3%	0.89					25	_	200	1900	180	180	_#	EBL	,
2:NBTL a			None			4.5	0.0	1.0	3.5	39.0%	39.0	20.5	4.0		4		4	NA		3%	0.89	21.4	940	30					1900	250	250	₽ ⁾	EBT	ļ
and 6:SBT																				3%	0.89				Yes		0	0	1900	25	25		EBR	4
'L, Start o			None					1.0			39.0	20.5	4.0		œ	8		Perm		0%	0.89					25	0	0	1900	5	5		WBL	4
f Yellow			None			4.5	0.0	1.0	3.5	39.0%	39.0	20.5	4.0		00		00	NA		0%	0.89	25.4	1116	30					1900	30	30	₽	WBT	†
																				0%	0.89				Yes		0	0	1900	85	85		WBR	<i>></i>
			C-Max		į		0.0				61.0	20.5	4.0		2	2		Perm		1%	0.89					25	_	200	1900	45	45	J.	NBL	۶
			C-Max		į		0.0				61.0	20.5	4.0		2		2	NA		1%	0.89	14.7	645	30					1900	425	425	→	NBT	→
			C-Max			4.5	0.0				61.0	20.5	4.0		2	2		Perm		1%	0.89				Yes		_	0	1900	155	155	74	NBR	•
			C-Max			4.5	0.0		3.5		61.0	20.5	4.0		6	6		Perm		3%	0.89					25	_	100	1900	135	135	_7(SBL	•
			C-Max			4.5	0.0	1.0	3.5	61.0%	61.0	20.5	4.0		6		6	NA		3%	0.89	9.5	417	30					1900	690	690	→	SBT	←
																				3%	0.89				Yes		0	0	1900	455	455		SBR	•

Tumwater Transportation Master Plan SCJ Alliance

Splits and Phases:

*\Pi_\@2 (R)

2: Crosby Blvd & Mottman Rd

HCM 2010 Signalized Intersection Summary 2: Crosby Blvd & Mottman Rd

Projected 2022 without improvements
PM Peak Hour

	>	ţ	4	٠	t	>	۶	→	•	✓	—	•
Movement	EBE	EBT	EBR .	WBL .	WBT	WBR	NBL .	NBT .	NBR ·	SBL	SBT	SBR
ane Configurations	J,	❖			₽		_#	→	٦,	Ħ	ᢌ	
Traffic Volume (veh/h)	180	250	25	5	30	85	45	425	155	135	690	455
uture Volume (veh/h)	180	250	25	ر ت	30	85	45	425	155	135	690	455
Number	7	4	14	ω	œ	18	5	2	12	_	6	16
nitial 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	100	100	100	1.00	1.00	1.00	1.00	1.00	100
Adj Sat Flow, ven/n/in	202	281	200	006	3/4	06	51	1881	17/	153	775	900
Adi No. of Lanes	1		0	0 0		0 6			;		2	0 0
eak 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
ercent Heavy Veh, %	ယ	ω	ω	0	0	0	_	_	_	ω	ω	ω
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	
3rp Volume(v), veh/h	202	0	309	136	0	0	51	478	174	152	775	0
Grp Sat Flow(s),veh/h/ln	1243	0	1816	1608	0	0	700	1881	1599	769	1752	0
2 Serve(g_s), s	9.6	0.0	15.7	0.1	0.0	0.0	3.2	: =	4.0	10.4	9.2	0.0
oron In Lane	100	0.0	0.00	00.4	0.0	0.0	100	Ξ	100	1 00.2	7.2	0.00
_ane Grp Cap(c), veh/h	262	0	428	416	0	0	488	1269	1078	516	2364	0
//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
Instream Filter(I)	1.00	0.00	3 .	1.00	0.00	0.00	003	02.0	003	1.0	1.00	0.0
Jniform Delay (d), 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
ncr Delay (d2), 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
nitial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.9	0.0	8.1	3.2	0.0	0.0	0.7	6.0	1.8	2.4	4.5	0.0
nGrp LOS	40.5	0.0	0/.0	2.70	0.0	0.0	۸.۷	۸ . ۶	V V	D.5.0	^ · ^	0.0
Annroach Vol. veh/h		511	,		136		2	703	,		927	
Approach Delay, s/veh		41.0			32.2			7.6				
Approach LOS		D			С			A			A	
Timer	_	2	ယ	4	5	6	7	∞				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		69.8		30.2		69.8		30.2				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		56.5		34.5		56.5		34.5				
Max Q Clear Time (g_c+l1), s		13.2		25.6		22.2		18.9				
Green Ext Time (p_c), s		15.4		2.4		14.2		در د				
ntersection Summary												
HCM 2010 Ctrl Delay												
HCM 20101 OS			16.8									

Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

Tumwater Transportation Master Plan SCJ Alliance

Lanes, Volumes, Timings 3: Crosby Blvd & Irving St

Projected 2022 without improvements

PM Peak Hour

The part of the

Natural Cycle: 65 Control Type: Actuated-Uncoordinated	Actuated Cycle Length: 47.6	Area Type: Cycle Length: 60	Intersection Summan	Recall Mode	Lead-Lag Optimize?	Lead/Lag	Total Lost Time (s)	Lost Time Adjust (s)	All-Red Time (s)	Yellow Time (s)	Total Split (%)	Total Split (s)	Minimum Split (s)	Minimum Initial (s)	Switch Phase	Detector Phase	Permitted Phases	Protected Phases	Turn Type	Shared Lane Traffic (%	Heavy Vehides (%)	Peak Hour Factor	Travel Time (s)	Link Distance (ft)	Link Speed (mph)	Right Turn on Red	Taper Length (ft)	Storage Lanes	Storage Length (ft)	Ideal Flow (vphpl)	Future Volume (vph)	Traffic Volume (vph)	Lane Configurations	Lane Group	
ted-Uncoordinat	gth: 47.6	Other	īy	None	Yes				-1:	3.5	14.29		8.	4.1					pm+pt	_	8%	0.89					2!) 75		EBI	\
ed				None	S	0		0.0		3.5						7 4	4		NA					468	30		Oi	0		_,		5 25		L EBT	ļ
				None			4.5	0.0		3.5						4	4		Perm		8%	0.89				Yes		_	200	1900	25	25	-4	EBR	1
				None		Lag				3.5			20.5	4.0		œ	00		Perm		1%	0.89					25	0	0	1900	30	30		WBL	1
				None	Yes		4.5									œ		œ	NA		1%	0.89	61.9	2725	30					1900	40	40	2 >	WBT	†
				None	Yes					3.5							00		Perm		1%	0.89				Yes		_	150	1900	185	185	74	WBR	1
				None	Yes	Lead	4.5									5	2	5	pm+pt		1%	0.89					25	_	200	1900	25	25	J	NBL	۶
				Max			4.5	0.0	1.0	3.5	51.7%	31.0	20.5	4.0		2		2	NA		1%	0.89	38.9	1710	30					1900	340	340	₩	NBT	→
																					1%	0.89				Yes		0	0	1900	25	25		NBR	•
				Max			4.5									6	6		Perm		2%	0.89					25	_	0	1900	160	160	J	SBL	•
				Max	Yes	Lag	4.5						20.5	4.0		6		6	NA		2%	0.89	14.7	645	30					1900	485	485	→	SBT	—
				Max	Yes	Lag	4.5	0.0	1.0	ω .5	37.5%	22.5	20.5	4.0		6	6		Perm		2%	0.89				Yes		_	250	1900	100	100	74	SBR	•

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-92

Splits and Phases: 3: Crosby Blvd & Irving St

HCM 2010 Signalized Intersection Summary 3: Crosby Blvd & Irving St

Projected 2022 without improvements

Movement	₽ `	₽ ↓	₩ 🗸	WBL	WBT T	WBR	₽ 🅕	NBT →	NBR	SBL 🗸	SB T
Lane Configurations Traffic Volume (veh/h)	75	% ⊅	γ , π	30	₽	185 - 34	ا ر ک	34 40 ₹	25	16 16	485
Future Volume (veh/h)	75	25	25	30	40	185	25	340	25	160	4
Number	7	4	14	ω	8	18	5	2	12	_	
Initial Q (Qb), veh	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	
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 Flow Rate, veh/h	84	28	28	34	45	208	28	382	28	180	545
Adj No. of Lanes	0	6	_ 6	0	5		{		0	5	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
Percent Heavy Veh, %	œ	8	00	_	_	_	_	_	_	2	2
Cap, veh/h	146	28	291	193	204	311	431	1041	76	623	880
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
Sat Flow, veh/h	15	142	1495	392	1047	1599	1792	1732	127	972	1863
Grp Volume(v), veh/h	112	0	28	79	0	208	28	0	410	180	545
Grp Sat Flow(s),veh/h/ln	156	0	1495	1439	0	1599	1792	0	1859	972	1863
Q Serve(g_s), s	3.7	0.0	0.7	0.1	0.0	5.3	0.3	0.0	5.0	5.3	9.6
Cycle Q Clear(g_c), s	3.7	0.0	0.7	3.8	0.0	5.3	0.3	0.0	5.0	5.3	9.6
Prop In Lane	0.75		1.00	0.43		1.00	1.00		0.07	1.00	
Lane Grp Cap(c), veh/h	8 0	0	291	397	000	311	431	30	1117	623	880
Avail Cap(c_a) veh/h	0.00	0.00	831	668	0.00	580	546	0.00	1117	623	880
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(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00
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
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	(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	
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.3	0.8	0.0	2.5	0.2	0.0	2.8	1.6	(7
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	=
LnGrp LOS		;	σ.	8		8	A		A	Þ	
Approach Vol, veh/h		140			287			438			725
Approach Delay, s/veh		2.9			17.9			5.5			11.1
Approach LOS		A			В			Α			
Timer	_	2	ω	4	5	6	7	8			
Assigned Phs		2		4	5	6		8			
Phs Duration (G+Y+Rc), s		31.0		13.1	5.7	25.3		13.1			
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5		4.5			
Max Green Setting (Gmax), s		26.5		24.5	4.0	18.0		16.0			
Max Q Clear Time (g_c+l1), 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											
			10.1								

Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

> HCM 2010 AWSC 4: Irving St & 7th Ave

Projected 2022 without improvements

atomostica Dolon of tob	2										
Intersection LOS	Α .										
Novement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT
raffic Vol, veh/h	0	5	15	175	0	1	20	1	0	185	5
Future Vol, veh/h	0	5	15	175	0	_	20	_	0	185	5
eak 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	_	_	_	2	0	0	0	2	_	_
Wwnt Flow	0	5	16	190	0	_	22	_	0	201	5
Number of Lanes	0	0	_	0	0	0	_	0	0	0	_
Approach		EB				WB				NB	
Opposing Approach		WB				EB				SB	
Opposing Lanes		_				_				_	
Conflicting Approach Left		SB				NB				EB	
Conflicting Lanes Left		ē _				G _				≦ <u></u>	
Conflicting Lapes Right		;				_ 6				_ ;	
HCM Control Delay		8.1				7.8				9.3	
HCM LOS		×				Þ				Þ	
ane		VBLn1	EBLn1	WBLn1	SBLn1						
/ol Left, %		97%	3%	5%	0%						
Vol Thru, %		3%	8%	91%	50%						
/ol Right, %		1%	90%	5%	50%						
Sign Control		Stop	Stop	Stop	Stop						
raffic Vol by Lane		191	195	22	10						
.T Vol		185	i o	3 _	0						
hrough Vol		5	15	20	5						
RT Vol		_	175		57						
ane Flow Rate		208	212	24	=======================================						
Geometry Grp		_	_	_	_						
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						
`andaa Tima		2.631	1.945	2.638	2.357						
SELVICE TITLE		0.266	0.231	0.031	0.013						
ICM Lane V/C Ratio			0	7.8	7.4						
HCM Control Delay		9.3	0.1								
HCM Lane V/C Ratio HCM Control Delay HCM Lane LOS		9.3 A	Α	Þ	Α						

Tumwater Transportation Master Plan SCJ Alliance

HCM 2010 AWSC 4: Irving St & 7th Ave

Projected 2022 without improvements
PM Peak Hour

Lane	HCM LOS A	HCM Control Delay 7.4	Conflicting Lanes Right 1	Conflicting Approach Right EB	Conflicting Lanes Left 1	Conflicting Approach Left WB	Opposing Lanes 1	Opposing Approach NB	Approach SB		anes 0 0	0 0	6 2 0	0.92 0.92	0 0	veh/h 0 0 5	Movement SBU SBL SBT SBR	Intersection LOS	Intersection Delay, s/veh	Intersection	

Tunwaler Transportation Master Plan
Synchro 9 Report
SCJ Alliance
6/10/2016

HCM 2010 TWSC 5: Crosby Blvd & Barnes Rd

Projected 2022 without improvements
PM Peak Hour

Minor Lane/Major Mvmi Capacity (velvh) HCM Lane V/C Ratio HCM Control Delay (s)	Minor Lane/Major Capacity (veh/h) HCM Lane V/C R	Minor Lane/Major Capacity (veh/h)	Minor Lane/Major		HCM LOS	HCM Control Delay, s	Approach	Stage 2	Stage 1	Mov Cap-2 Maneuver	Mov Cap-1 Maneuver	Platoon blocked, %	Stage 2	Stage 1	Pot Cap-1 Maneuver	Follow-up Hdwy	Critical Hdwy Stg 2	Critical Hdwy Stg	Critical Hdwy	Stage 2	Stage 1	Conflicting Flow All	Major/Minor	Mvmt Flow	Heavy Vehicles, %	Peak Hour Factor	Grade, %	Veh in Median Storage,	Storage Length	RT Channelized	Sign Control	Conflicting Peds, #/hr	Future Vol, veh/h	Traffic Vol, veh/h	Movement	Int Delay, s/veh	Intersection	
<u> </u>				Mvmt		ay, s				uver	uver	%			ver		2					€	_		87			orage, #				#/hr				6.3		
7.6	0.00	0 001	1370	NBL	D	29.2	ΕB	633	384	157	157		856	384	254	3.59	6.2	6.2	7.2	129	764	893	/linor2	=======================================	10	91		·				0	10	10	EBL			
0				NBT				773	321	218	218		774	401	273	4.09	5.6	5.6	6.6	129	764	893		_	10	91	0	0				0	_	_	EBT			
		- 0.075	- 161	NBR EBLn1WBLn1WBLn2							841				841	3.39			6.3			181		0	10	91				None	Stop	0	0	0	EBR			
	ر د د	0.074	1 223	1WBLn1V	σ.	⇉	WB	316	877	223	223		396	878	264	3.518	6.12	6.12	7.12	764	126	890	Minor1	=======================================	2	91					Stop	0	10	10	WBL			
	10.2	0.255	927	VBLn2				327	791	222	222		408	792	278	4.018	5.52	5.52	6.52	775	126	901		5	2	91	0	0			Stop	0	5	5	WBT			
	20	0.199	1460	SBL						,	927				927	3.318	,		6.22			124		236	2	91		í	0	None	Stop	0	215	215	WBR			
				SBT																			×															
				SBR		0.1	NB		,	,	1370		ř		1370	2.236			4.14		,	192	Najor1	_	4	91		í			Free	0	_	_	NBL			
													,									0		121	4	91	0	0			Free	0	110	110	NBT			
																						0		5	4	91				None	Free	0	57	5	NBR			
						4.9	SB				1460				1460	2.218			4.12			126	Major2	291	2	91			175		Free	0	265	265	SBL			
									,	,	,						,				,	0		170	2	91	0	0		,	Free	0	155	155	SBT			
									,	,											,	0		22	2	91				None	Free	0	20	20	SBR			

Tumwater Transportation Master Plan SCJ Alliance

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

Projected 2022 without improvements

PM Peak Hour

FBT FBR WBL WBT NBL NBR 175 75 165 330 190 135 175 75 165 330 190 135 175 75 165 330 190 135 175 75 165 330 190 135 170 135 170 170 135 170 17	EBT EBR WBL WBT NBL 175 75 165 330 190 175 75 165 330 190 175 75 165 330 190 0 0 0 0 0 0 0 0 0 0 176 176 330 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 186 80 176 351 202 0 0 226 0 928 0 2.66 0 928 0 2.22 3509 226 0 2.1310 259 259 0 2.1310 259	HCM 95th %tile Q(veh) 10.5		HCM Control Delay (s) 71.7	0		Minor Lane/Major Mvmt NBLn1	HCM LOS	HCM Control Delay, s	Approach	Stage 2	Stage 1	Mov Cap-2 Maneuver	Mov Cap-1 Maneuver	Platoon blocked, %	Stage 2	Stage 1	Pot Cap-1 Maneuver	Follow-up Hdwy	Critical Hdwy Stg 2	Critical Hdwy Stg 1	Critical Hdwy	Stage 2	Stage 1	Conflicting Flow All	Major/Minor	Mvmt Flow	Heavy Vehicles, %	Peak Hour Factor	Grade, %	Veh in Median Storage, #	Storage Length	RT Channelized	Sign Control	Conflicting Peds, #/hr	Future Vol, veh/h	Traffic Vol, veh/h	Movement	Int Delay, s/veh 23
WBL WBT NBL 165 330 190 165 330 190 0 0 0 0 0 0 Free Slop - 0 0 - 0 0 - 0 0 - 0 0 - 0 0 - 0 0 0 0 0 0 0 0 176 351 202 Minori Minori Minori 100 Minori 110 110 110 110 110 110 110 1	WBL WBT NBL 165 330 190 165 330 190 165 330 190 0 0 0 Free Slop - 0 0 - 0 <t< td=""><td>, ,</td><td>,</td><td>.7 -</td><td></td><td></td><td></td><td></td><td>0</td><td>EB</td><td></td><td></td><td></td><td></td><td></td><td>ì</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>0</td><td>Major1</td><td>186</td><td>ω</td><td>94</td><td>0</td><td>0</td><td></td><td></td><td></td><td>0</td><td>175</td><td></td><td></td><td></td></t<>	, ,	,	.7 -					0	EB						ì									0	Major1	186	ω	94	0	0				0	175			
WBL WBT NBL 165 330 190 165 330 190 0 0 0 0 Free Free Slop None 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 176 351 202 266 0 928 266 0 928 266 0 928 266 0 928 266 1 541 2 2 641 4 1 541 2 2 641 5 41 2 2 641 4 1 541 2 2 814 4 93 1310 259 1310 259 1310 259 1310 259 1310 259 1310 1 259 1310 259 1310 1 259 1310 259 1310 1 259 1310 259 1310 1 259 1310 1 541 2 27 177 F WBT WBT	WBL WBI NBL 165 330 190 165 330 190 0 0 0 0 0 0 Free Free Stop None 0 0 250 0 0 0 0 0 0 0 0 94 94 94 0 0 0 94 94 94 0 0 0 0 176 351 202 266 0 928 226 - - 226 928 - - 226 702 4.1 - 6.41 5.41 - - 259 1310 259 1310 - 259 259 - - 427 WB NB NB VBB NB <			- 8.2	- 0.134	- 1310					٠	٠													0		80	ω	94				lone	Free	0	75	75	EBR	
NBL 190 190 190 0 Slop 0 0 94 41 202 Minor1 928 226 702 6.41 5.41 5.41 5.41 493 3.509 2814 493 259 814 493 71.7 F NB 71.7 F	NBL 190 190 190 0 Slop 0 0 94 4 1 202 Minor1 928 226 702 6.41 5.41 5.41 5.41 493 3.509 289 814 493 259 814 493 71.7 F R								2.7	WB				1310		í		1310	2.2			4.1			266	Major2													
												•						•	•						0		351	0	94	0	0		one	ree	0	330	330	/BT	
NBR 135 135 135 135 0 0 Stop None 94 1 144 1144 1144 1144 1144 1144 1144	NBR 135 135 135 0 0 Step None - - - 94 1 1 144 226 - - - - - - - - - - - - - - - - - -							т	71.7	NB	427	814	259	259		493	814	299	3.509	5.41	5.41	6.41	702	226	928	Minor1	202	_	94	0	0	0		Stop	0	190	190	NBL	
														816				816	3.309			6.21			226		144	_	94				None	Stop	0	135	135	NBR	

Synchro 9 Report 6/10/2016

Tumwater Transportation Master Plan SCJ Alliance

HCM 2010 TWSC 7: RW Johnson Rd & Sapp Rd

Projected 2022 without improvements

HOM 95th %tile O(veh)	HCM I and I OS	HCM Control Delay (s)	HCM Lane V/C Ratio	Capacity (veh/h)	Minor Lane/Major Mvmt	HCMILOS	HCM Control Delay, S	No Concession	Annroach	¢	Stage 2	Stage 1	Mov Cap-2 Maneuver	Mov Cap-1 Maneuver	Platoon blocked, %	Stage 2	Stage 1	Pot Cap-1 Maneuver	Follow-up Hdwy	Critical Hdwy Stg 2	Critical Hdwy Stg 1	Critical Hdwy	Stage 2	Stage 1	Conflicting Flow All	Major/Minor	Mvmt Flow	Heavy Vehicles, %	Peak Hour Factor	Grade, %	Veh in Median Storage, #	Storage Length	RT Channelized	Sign Control	Conflicting Peds, #/hr	Future Vol, veh/h	Traffic Vol, veh/h	Movement	Int Delay, s/veh	
0 A	> :	9.7	0.031	792	NBLn1		2.4		FR					1429				1429	2.227			4.13		,	147	Major1	18	ω	85					Free	0	15	15	EBL	5.7	
o 2	> 0	7.6	0.012	1429	EBL								,	,				í		í				í	0		35	ω	85	0	0			Free	0	30	30	EBT		
. 1	> <	0			EBT								,	,		í		í		í	,			í	0		2	ω	89		,		None	Free	0	2	2	EBR		
					EBR																					_														
o 2	> :	7.3	0.007	1579	WBL		0.5	2 2	NR R				,	1579				1579	2.209	í		4.11		í	38	Najor2	12	_	85		,			Free	0	10	10	WBL		
. 1	> «	0			WBT								,					ì		ï				ì	0		53	_	85	0	0			Free	0	45	45	WBT		
- 09		- 11.1	- 0.225	- 758	WBR SBLn1															i					0		94	_	89				None	Free	0	80	88	WBR		
0	σ:		úī	œ		Þ	9.7	2 2	NR		792	931	678	678		854	943	735	3.5	6.1	6.1	7.1	153	72	225	Minor1	_	0	85		,			Stop	0	_	_	NBL		
											755	828		648		761				5.5	5.5				243		12	0	85	0				S	0	10	10	NBT		
														1042				1042				6.2		ì	36		12	0	85					Ś	0	10	10	NBR		
						σ.	, =	2 0	SB		887	867	717	717		922	878	747	3.527	6.13	6.13	7.13	84	124	208	Minor2	112	ω	85					Stop	0	95	95	SBL		
											821		682					697				6		124	197			ω						Ś	0			SBT		
														953				953	3.327	,		6.23		,	100		41	ω	85					Stop	0	35	35	SBR		

Tumwater Transportation Master Plan SCJ Alliance

HCM 2010 TWSC 8: Sapp Rd & Crosby Blvd

Projected 2022 without improvements
PM Peak Hour

Approach HCM Control Delay, s HCM LOS Minor Lane/Major Mvmt Capacity (veh/h) HCM Lane V/C Ratio HCM Control Delay (s) HCM Lane LOS HCM Lane LOS HCM Lane LOS	Platoc Mov C	Conflica Critica Critica Follow	Movement Traffic Vol. Future Vol. Conflicting Sign Contine RT Channe RT Channe Storage Le Veh in Mec Grade, & Peak Hour Heavy Veh Mvmt Flow	Intersection
Approach JCM Control Delay, s ICM LOS Alton Lane/Major I/Mm Japacity (veh/h) ICM Lane V/C Ratio ICM Control Delay (s) ICM Lane LOS ICM Sth %tile Q(veh)	Stage 1 Stage 2 Stage 2 Valor blocked, % Valor Cap-1 Maneuver Valor Cap-2 Maneuver	Conflicting Flow All Stage 1 Stage 2 Stage 2 Critical Hdwy Critical Hdwy Stg 1 Critical Hdwy Stg 2 Critical Hdwy Stg 2 Follow-up Hdwy Dot Can-1 Maneure	Int Delay, Siven Movement Traffic Vol, veh/h Conflicting Peds, #/hr Confli	ction
Delay, Iajor M Iajor M C Rati C Rati Delay DS DS	led, % laneuw laneuw	Stg 1 Stg 2 wy	en eh/h ed, #/h ed th n Stora actor es, %	F
s vmt vmt (s)	व व व		ige, #	
Z 1	~ (B (B ~ ~)	296 225 711 7.11 6.11 3.509	<u> </u>	٥
WB 12.8 B	780 780 543 543	296 225 71 7.11 6.11 6.11 -	WBL 100 100 0 0 0 Stop 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
BRWBLn1V - 543 - 0.202 - 13.3 - B		ω	7	
	817	225 - - 6.21 - - 3.309	WBR 15 15 15 0 0 None 0 16	
BLn2 SI 817 0.02 (9.5 A A				
BLn1 720 720 10.1 10.1 0.1				
NB 0 0 SBLn2 632 0.226 12.4 B			NBT 155 155 156 0 Free - - 0 0 91 170	
			NBR 100 100 0 0 Free None - - 91 110	
SB 12.2 B	782 782 720 720 720 766	225 0 225 7.1 6.1 3.5	SBL 15 15 15 0 0 Stop - - 91 0 0 16	
B 22			7	
	632 683 683	280 0 280 6.5 - - 5.5	43 0 0 0 n n n n n n n n n n n n n n n n	

Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

SimTraffic Performance Report

Projected 2022 without improvements

PM Peak Hour

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

	0.8	5.6	8.5	7.8	4.7	8.3	7.6	ω .ω	7.1	5.7	Total Del/Veh (s)
0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	Denied Del/Veh (s)
SBT	SBL	NBR	NBT	NBL	WBR	WBT	WBL	EBR	EBT	EBL	Movement

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

Total Del/Veh (s) 4.6

Tumwaler Transportation Waster Plan
SCI Alliance SCI Alliance SCI Alliance SCI Alliance

Lanes, Volumes, Timings
10: Capitol Blvd & Sunset Way & Carlyon Ave

Projected 2022 without improvements
PM Peak Hour

Control	Actuate	Cycle L	Area Type:	Intersec	Recall	Lead-La	Lead/Lag	Total Lo	Lost Tir	All-Red	Yellow	Total S	Total S ₁	Minimu	Minimu	Switch	Detecto	Permitte	Protect	Turn Type	Shared	Heavy \	Peak H	Travel	Link Dis	Link Sp	Right T	Taper L	Storage	Storage	Ideal FI	Future :	Traffic \	Lane C	Lane Group	
Natural Cycle: 43 Control Type: Actuated-Uncoordinated	ctuated Cycle Length: 62.4	ycle Length: 95	/pe:	tersection Summary	Mode	Lead-Lag Optimize?	ag	otal Lost Time (s)	ost Time Adjust (s)	III-Red Time (s)	'ellow Time (s)	plit (%)	Total Split (s)	Minimum Split (s)	m Initial	witch Phase	etector Phase	ermitted Phases	Protected Phases	/pe	hared Lane Traffic (%)	leavy Vehicles (%	eak Hour Factor	ravel Time (s)	_ink Distance (ft)	eed (mp	light Turn on Red	aper Length (ft)	torage Lanes	itorage Length (ft)	deal Flow (vphpl)	uture Volume (vph)	raffic Volume (vph)	ane Configurations	roup	
ctuated-	Length:	5		nmary		nize?		(s)	st (s)					s)	(s)			es	es		affic (%)	%	or		_)	ed	0		∄	೨	(vph)	(vph)	tions		
Uncoord	62.4		Other		_							ω																							<	
inated			Ä		None					1.0	3.5	1.1%	29.5	29.5	6.0		00		00	Prot		0%	0.85								1900	5	5		NBL2	1
					None			4.5	0.0	1.0	3.5	31.1%	29.5	29.5	6.0		00		00	Prot		0%	0.85	19.1	840	30		25	_	0	1900	55	55	54	WBL	ሽ
																						0%	0.85				Yes		0	0	1900	40	40		WBR	ß
					None			4.5	0.0	1.0	3.5	22.6%	21.5	21.5	6.0		4		4	Prot		0%	0.85	14.3	629	30		25	_	0	1900	35	35	-∢	NBL	>
																						0%	0.85						0	0	1900	15	15		NBR	-4
																						0%	0.85				Yes				1900	2	2		NBR2	•
					Max	Yes	Lag	4.5	0.0	1.0	3.5	32.1%	30.5	29.5	10.0		2		2	K		2%	0.85	16.6	731	30					1900	565	565	≱	NET	×
																						2%	0.85						0	0	1900	90	90		NER	\
																						2%	0.85				Yes				1900	15	15		NER2	4
					None	Yes	Lead			1.0	3.5	14.2%	13.5	10.5	6.0		_		_	Prot		1%	0.85								1900	50	50		SWL2	€
					None	Yes	Lead	4.5	0.0	1.0	3.5	14.2%	13.5	10.5	6.0		_		_	Prot		1%	0.85					25	_	150	1900	10	10	SH.	SWL	*
					Max			4.5	0.0	1.0	3.5	46.3%	44.0	20.0	10.0		6		6	NA		1%	0.85	18.0	791	30					1900	995	995	\$	SWT	×

Splits and Phases: 10: Capitol Blvd & Sunset Way & Carlyon Ave



Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

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

Projected 2022 without improvements

PM Peak Hour

Intersection Summary HCM 2000 Control Delay HCM 2000 Volume to Capacily ratio Actuated Cycle Length (s) Intersection Capacily Utilization Analysis Period (min) c Critical Lane Group	luliform Delay, d1 Uniform Delay, d1 Progression Factor Progression Factor Incremental Delay, d2 Delay (s) Level of Service Approach Delay (s) Approach LOS	Permitted Phases Actuated Green, G (s) Effective Green, g (s) Actuated g/C Ratio Clearance Time (s) Vehicle Extension (s) Vehicle Extension (s) Vs Ratio Port Vs Ratio Porm	Peak-hour factor, PHF Adj. Flow (vph) ATOR Reduction (vph) Lane Group Flow (vph) Heavy Vehicles (%) Turn Type Protected Phases	Wovement Lane Configurations Traffic Volume (vph) Future Volume (vph) Total Lost time (s) Lane Util. Factor Frt Frt H Protected Satd. Flow (prd) Fit Permitted Satd. Flow (perm)	
pacity ratio) Ization			0.85 6 0 0 0% Prot 8	WBL2 5 5 1900	4
	0.07 28.1 1.00 0.2 28.3 C 28.3 C	5.4 5.4 0.08 4.5 3.0 142 c0.01	0.85 65 108 10 0% Prot	WBL 55 55 1900 4.5 1.00 0.95 0.97 1745	ሽ
10.8 0.46 66.2 49.7% 15			0.85 47 0 0 0%	WBR 40 40 1900	ß
5 S I	0.03 29.8 1.00 0.2 30.0 C	3.4 3.4 0.05 4.5 3.0 90 c0.00	0.85 41 58 3 0% Prot	NBL NBL 100 35 35 1900 4.5 1.00 0.96 0.97 1.757 1.757	>
HCM 2000 Level of Sum of lost time (s) ICU Level of Servic			0.85 18 0 0 0%	NBR 15 1900	_
HCM 2000 Level of Service Sum of lost time (s) ICU Level of Service			0.85 2 0 0 0%	NBR2 2 1900	•
Service	0.46 10.8 1.00 0.9 11.7 B 11.7 B	32.9 32.9 0.50 4.5 3.0 1717 0.23	0.85 665 1 788 2% NA	NET 565 565 565 1900 4.5 0.95 0.98 1.00 3456 3456	×
			0.85 106 0 0 2%	NER 90 90 1900	\
18.0 A			0.85 18 0 0 2%	NER2 15 15 1900	4
			0.85 59 0 0 1% Prot	SWL2 50 50 1900	€
	0.41 28.0 1.00 1.5 29.6 C	6.5 6.5 0.10 4.5 3.0 175	0.85 12 0 71 1% Prot	SWL 10 10 10 10 10 10 10 10 10 10 10 17 17 17 17 17 17 17 17 17 17 17 17 17	1
	0.49 5.6 1.00 0.7 6.3 A 7.7 A	43.9 43.9 0.66 4.5 3.0 2370 c0.33	0.85 1171 0 1171 1171 18 NA	SWT *** 995 995 995 1900 4.5 0.95 1.00 1.00 1.00 3574 1.00 3574	×

Tumwater Transportation Master Plan SCJ Alliance

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

Projected 2022 without improvements
PM Peak Hour

Int Delay, Siven									
Movement	SEL	SET			NWT	T NWR	SWL	SWR	Ŕ
Traffic Vol, veh/h	160	325			245		0		0
Future Vol, veh/h	160	325			245	5 140	0		0
Conflicting Peds, #/hr	0	0			0		0		0
Sign Control	Free	Free			Free		Stop	Sto	Ď
RT Channelized		None						None	т о
Storage Length							0		
Veh in Median Storage, #		0				0 -	0		
Grade, %		0			0		0		
Peak Hour Factor	79	79			7	9 79	79	- 1	79
Heavy Vehicles, %	0	0					0		0
Mvmt Flow	203	411			310	0 177	0		0
Major/Minor	Major1				Major2	2	Minor2		
Conflicting Flow All	487	0				- 0	1215	399	19
Stage 1	,	í					399		
Stage 2							816		
Critical Hdwy	4.1						6.4	6	6.2
Critical Hdwy Stg 1							5.4		
Critical Hdwy Stg 2		,					5.4		
Follow-up Hdwy	2.2						3.5	3.3	w
Pot Cap-1 Maneuver	1086	ï					202	65	Ġ,
Stage 1							682		
Stage 2		,					438		
Platoon blocked, %									
Mov Cap-1 Maneuver	1086						153	655	ői
Mov Cap-2 Maneuver							153		•
Stage 1							682		
Stage 2							332		
Approach	SE				WN	N	SW		
HCM Control Delay, s	3					0	0		
HCM LOS							А		
			2						
Minor Lane/Major Mvmt	TWN	NWR	SEL	SETSWLn1	/Ln1				
Capacity (veh/h)			1086						
HCM Lane V/C Ratio	,	,	0.186	,					
HCM Control Delay (s)		,	9.1	0	0				
HCM Lane LOS			Þ	A	⊳				
HCM 95th %tile O(veh)			0.7						

Synchro 9 Report 6/10/2016

Tumwater Transportation Master Plan SCJ Alliance

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

Projected 2022 without improvements

PM Peak Hour

Minor2 1734 1734 14 18 18 19 19 19 19 19 19 19 19	Int Delay, s/veh Movement Traffic Vol, veh/h Future Vol, veh/h Conflicting Peds, #/hr Sign Control Storage Length Veh in Median Storage. #	3.8 EBL 0 0 Stop 0	EBR 0 0 0 Stop None	NBL 450 450 0 0 Free	NBT 400 400 0 Free None
Minor2 1734 1734 1734 321 1413 5.4 5.4 - 5.4 - 740 227 740 227 740 137 - 137 - 133 - 1233 - 0.397	Grade, % Peak Hour Factor	90	9 ,	9 .	90
Minor2 1734 1734 - 1737 321 - 1413 - 5.4 - 5.4 - 5.4 - 5.4 - 5.4 - 5.9 - 740 0 227 0 227 0 227 0 - 137 - 133 133	Heavy Vehicles, %	o o i	o o i	489 1	435
Minor2 1734 - 1734 - 1734 - 1734 - 1731 - 1			c		Š
321 1413 5.4 5.4 -5.4 -5.4 -5.4 -740 0 227 0 227 0 227 0 227 0 227 0 137 -13	Major/Minor Conflicting Flow All	Minor2 1734		Major1 332	0
1413	Stage 1	321		-	, c
5.4	Stage 2 Critical Hdwy	6.4		4.11	
3.5 3.5 0 740 0 227 0 227 0 59 - 137 - 137 - 137 - 137 - 137 - 137 - 137 - 137 - 137 - 137 - 137 - 137 - 137 - 137 - 138 - 139 - 13	Critical Hdwy Stg 1	5.4			
98 0 740 0 227 0 59 - 59 - 740 - 137 - 137 - 133 - 5 A 1233 - 1233 - 1233 - 1233 - 1397 - 19,8 - 19 - 19 -	Follow-up Hdwy	3.5		2.209	
740 0 227 0 59 - 59 - 740 - 137 - 137 - 1233 - 1233 - 0397 - 0397 - 0397 - 1,9	Pot Cap-1 Maneuver	98	0	1233	
EB EB 137 A 137 137 137 137 137 137	Stage 1	740 227	00		
59	Platoon blocked, %				
740	Mov Cap-1 Maneuver	59		1233	
EB EB O NBL NBTEBLn1 1233 0.397 0.397 0.397 0.397 179 199	Stage 1	740			
EB 0 0 A A A A A A A A A A A A A A A A A	Stage 2	137			
NBL NBTEBLn1 1233 0.397 9.8 - 0 1.9 1.9	Approach	EB		NB	
mt NBL NBTEBLn1 1233 0.397 9,8 - 0 A - A h) 1.9	HCM Control Delay, s HCM LOS	A 0		5.2	
1233	Minor Lane/Major Mvmt	NBL	NBT EBLn1	SBT SBR	
0.397 - 9.8 - A - h) 1.9 -	Capacity (veh/h)	1233			
Q(veh) 1.9 -	HCM Lane V/C Ratio	0.397			
Q(veh) 1.9 -	HCM Control Delay (s)	9.8 A			
	HCM 95th %tile Q(veh)	1.9			

Tumwater Transportation Master Plan SCJ Alliance

SimTraffic Performance Report

Projected 2022 without improvements
PM Peak Hour

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

Tatal DalMah (a) 07 10 10 240 100 167

SimTraffic Report 6/8/2016

Tumwater Transportation Master Plan SCJ Alliance

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

*

Projected 2022 without improvements

Area Type: Other Cycle Length: 80 Actualed Cycle Length: 66.9 Natural Cycle: 90 Control Type: Actualed-Uncoordinaled Lane Group Lane Configurations Traffic Volume (vph) Future Volume (vph) Ideal Flow (vphp) Storage Length (ft) Storage Length (ft) Storage Length (ft) Storage Length (ft) Right Turn on Red Link Speed (mph) Link Distance (ft) Travel Time (s) Peak Hour Factor Heavy Vehicles (%) Shared Lane Traffic (%) Turn Type Protected Phases Demotited Phases Demotited Phases Switch Desco Switch Phase Minimum Initial (s) Minimum Spill (s) Total Spill (%) Total Spill (%) Yellow Time (s) All-Red Time (s) Lost Time Adjust (s) Total Lost Time (s) Lead-Lag Optimize? Recall Mode 4.0 10.0 11.0 13.8% 3.5 1.0 0.0 4.5 None Prot 8 30 662 15.0 0.88 175 175 1900 1900 0 1 25 None None 4.0 10.0 11.0 13.8% 3.5 1.0 0.0 4.5 Perm 0.88 180 180 180 1900 225 Yes 4.0 24.5 25.0 31.3% 3.5 1.0 0.0 30 2035 46.3 0.88 20 20 1900 2 NA 0.88 210 210 1900 0 0 Yes 4.0 20.0 44.0 55.0% 3.5 1.0 0.0 840 840 1900 0 1 25 Max 0.88 Split 6 6 4.0 20.0 44.0 55.0% 3.5 1.0 0.0 255 255 1900 Max 30 505 111.5 0.88 6 NA

25 s

◆ Ø8

Splits and Phases:

14: 2nd Ave & Custer Way

Tumwater Transportation Master Plan SCJ Alliance

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

Projected 2022 without improvements PM Peak Hour

					31.1 C			HCM 2010 Ctrl Delay HCM 2010 LOS
								Intersection Summary
0.0	2	4.2				0.3		Green Ext Time (p_c), s
8.5	00	29.8				5.7		Max Q Clear Time (g_c+l1), s
6.5	5	39.5				20.5		Max Green Setting (Gmax), s
4.5	5	4.5				4.5		Change Period (Y+Rc), s
11.0	0	44.0				9.4		Phs Duration (G+Y+Rc), s
8	6					2		Assigned Phs
8	6 7		5	4	ω	2	_	Timer
	В	_			С		П	Approach LOS
	0	16.0			32.9		108.9	Approach Delay, s/veh
	5	1245			97		239	Approach Vol, veh/h
	A	Ļ	В	C		С	F	LnGrp LOS
	2	6.2	19.0	32.9	0.0	27.0	125.3	LnGrp Delay(d),s/veh
	5	2.	16.2	1.8	0.0	0.7	8.0	%ile BackOfQ(50%),veh/ln
	0	0.0	0.0	0.0	0.0	0.0	0.0	Initial Q Delay(d3),s/veh
	51	0.	, , , ,	3.7	0.0	0.3	96.4	Incr Delay (d2), s/veh
	7	5.7	10.2	29.2	0.0	26.7	28.9	Uniform Delay (d), s/veh
	0	1.00	1.00	1.00	0.00	1.00	1.00	Upstream Filter(I)
	0	1.00	1.00	1.00	1.00	1.00	1.00	HCM Platoon Ratio
	57 (1165	1110	528	0	161	181	Avail Cap(c_a), veh/h
	טח מ	0.25	0.86	0.77	0.00	0.25	1.10	V/C Ratio(X)
	ייי	1165	1110	126	0	161	181	Lane Gro Cap(c), veh/h
			100	0.76	9.0	100	100	Prop In I ane
	лс	л 4.0	27.0	2.7	0.0	л ::	5 О	Cycle O Clear(n.c) s
	n C	1900	370	3 7	200	1 5	76/1	O Social Signal
	0	290	955	97	0	40	1700	Grp Volume(v), veh/h
	0	1900	1810	1265	393	1599	1792	Sat Flow, veh/h
	_	0.61	0.61	0.08	0.08	0.10	0.10	Arrive On Green
	ST.	1165	1110	96	38	161	1 81	Cap, veh/h
	0	0	0	_	_		:	Percent Heavy Veh, %
	œ -	0.80	0.88	0.88	0.88	0.88	0.88	Peak Hour Factor
	10		1 20	0 }		_		Adi No of Lanes
		200	055	7/	23	1001	100	Adj Sat Flow, ven/rvin
		1.00	1.00	1.00	1.00	1.00	1.00	Parking Bus, Adj
		,	1.00	1.00	3	1.00	1.00	Ped-Bike Adj(A_pb1)
	0		0	0	0	0	0	Initial Q (Qb), veh
	6	6	_	12	2	18	ω	Number
	5	255	840	210	20	180	175	Future Volume (veh/h)
	57 -	255	840	210	20	180	175	Traffic Volume (veh/h)
	•		H		₽	-34	Ħ	Lane Configurations
	_	SBT	SBL	NBR	NBT	WBR	WBL	Movement
		+	*	•	_	1	1	
		-	-		•	•		

Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

> HCM 2010 TWSC 15: Boston St & Custer Way

Projected 2022 without improvements
PM Peak Hour

Sign Control Fr RT Channelized Storage Length Veh in Median Storage. #	Free Free		Free None	425 -	0	None .		0 , ,	None -
	95 .	95 1 826	95 . 184	95 1	95 1	5 1 95 .	95 -	95 0	95 0 174
7				Major2			Minor1		
Conflicting Flow All 358 Stage 1	358	. 0	. 0	1011	. 0	. 0		2076	505
	i .			1 .				1158	
Critical Hdwy Stg 1 -	. 3			4.115				5.5	6.9
g 2	2 .			3000				5.5	ა ა ,
Pot Cap-1 Maneuver 1205	S 8	•	•	689			0	54	518
Stage 1 Stage 2							0 0	353 273	
euver 1	1205			689				23	518
Mov Cap-2 Maneuver Stage 1								23 353	
Stage 2								115	
Approach	EB			WB			NB		
HCM Control Delay, s HCM LOS	0			9.1			17.6 C		
Minor Lane/Major Mvmt NBL	ni E	BL E	EBT EB	R WBL	WBT	WBR SBLn	BLn1		
	459 1205	05		- 689					
Ratio 0						,	105		
		0 .		- 0.581			105 0.06 41.5		

Tumwater Transportation Master Plan SCJ Alliance

HCM 2010 AWSC 16: Deschutes Way & Boston St

Projected 2022 without improvements
PM Peak Hour

Intersection										
Intersection Delay, s/veh	41.2									
Intersection LOS	ш									
Movement	WBU	WBL		WBR	NBU	NBT	NBR	SBU	SBL	SBT
Traffic Vol, veh/h	0	115		410	0	400	75	0	110	200
Future Vol, veh/h	0	115		410	0	400	75	0	110	200
Peak Hour Factor	0.92	0.93		0.93	0.92	0.93	0.93	0.92	0.93	0.93
Heavy Vehicles, %	2	_		_	2	0	0	2	0	0
Mvmt Flow	0	124		441	0	430	81	0	118	215
Number of Lanes	0	_		0	0	_	0	0	0	_
Approach		WB				NB			SB	
Opposing Approach						SB			NB	
Opposing Lanes		0				_			_	
Conflicting Approach Left		NB							₩B	
Conflicting Lanes Left		_				0			_	
Conflicting Approach Right		SB				WB				
Conflicting Lanes Right		_				_			0	
HCM Control Delay		50				44.2			21.5	
HCM LOS		r							C	
Lane		NBLn1 \	WBLn1	SBLn1						
Vol Left, %		0%	22%	35%						
Vol Thru, %		84%	0%	65%						
Vol Right, %		16%	78%	0%						
Sign Control		Stop	Stop	Stop						
Traffic Vol by Lane		475	525	310						
LT Vol		0	115	110						
Through Vol		400	0	200						
RT Vol		75	410	0						
Lane Flow Rate		511	565	333						
Geometry Grp		_	_	_						
Degree of Util (X)		0.908	0.949	0.639						
Departure Headway (Hd)		6.401	6.054	6.896						
Convergence, Y/N		Yes	Yes	Yes						
Cap		567	598	520						
Service Time		4.465	4.107	4.969						
HCM Lane V/C Ratio		0.901	0.945	0.64						
HCM Control Delay		٥	7							
HCM Lane LOS		44.2	50	21.5						
		#4.Z	m S	21.5 C						

Synchro 9 Report 6/10/2016

Tumwater Transportation Master Plan SCJ Alliance

HCM 2010 TWSC
17: Capitol Blvd & Cleveland Ave

Projected 2022 without improvements

PM Peak Hour

Traffic Vol, veh/h Future Vol, veh/future Vol, v
I, veh/h I,
JPeds,#hr 0 0 0 JPeds,#hr 0 0 0 elized Stop Stop Stop Stop Stop Stop Stop Stop
oriol Stop Stop elization - None elization - O - O - O - O - O - O - O - O - O -
leilized - None elized - None elized - None elized - O - O - O - O - O - O - O - O - O -
ength - 0 dian Storage, # 0 - 1 dian Storage, # 0 - 2 dian Storage, # 0 - 2 dian Storage, # 0 - 2 dian Storage, # 4 4 dian Storage, # 4 di
dian Storage, # 0
r Factor 88 88 88 88 88 88 88 88 88 88 88 88 88
rFactor 88 88 hides, % 4 4 y or 0 278 Flow All 261 Je 1 - 261 Je 21 - 261 Je 21 - 269 Hwy Stg 1 - 269 Hwy Stg 2 - 2 Je 2 - 3 Je 3
Minor1 261 - 261 6.98 - 6.98 - 6.98 - 732 0 732 0 732 0 - 732 1047 - 732 1047 - 1.29 1
Minori 261 261 262 6.98 6.98 732 732 732 732 732 732 732 73
Minori 261 - 261 6.98 3.34 - 3.34 - 3.32 0 732 0 732 0 732 NB
Minori 261 - 261 6.98 3.34 - 3.34 - 3.34 - 732 0 732 0 - 732 0 - 732 1047 - 1.29 1
261 - 6.98 - 3.34 - 3.34 - 732 0 732 0 - 732 0 - 732 NB NB NB NB NB NB NB NB NB N
NB NET NER NBLn1 SWL 16.98 17.29 18.129 19.30 10.30
. 6.98 . 3.34 . 3.34 . 732 0 732 0 . 732 . 732
NB NET NERNBLn1 SWL NB NET NERNBLn1 SWL NB NB NB NB NB NB NB NB NB N
NB NET NERNBLn1 SWL NB NB NET NERNBLn1 SWL NB NB NB NB NB NB NB NB NB N
NB NET NER NBLn1 SWL 1. 2. 3.34 0. 732 0
NB 129 NET NERNBLn1 SWL 732 10 129 10 11 10 11 11 11 11 11 11 1
0 732 0 - 732 0 - 732 1 - 732 1 - 732 1 - 732 1 - 732 1 0.47 5 - 732 1 0.47 5 - 732 1 0.47 6 - 732 1 0.47 6 - 732 1 0.47 6 - 732 1 0.47 7 - 0.38 7
0 - 732 - 732 - 732 - 1 732 - 1 732 - 1 732 - 1 732 - 732 - 732 - 732 - 732 - 732 - 733 -
0 - 732 - 732 - 1 732 - 1 732 - 1 732 - 1 732 - 732 1047 - 733 0.429 - 1 2.9 11 - 1 8 8
NB NB 12.9 NET NERNBLn1 SWL 732 1047 0.38 0.429 1. 0.38 0.429 1. 0.38 0.429 1. 0.38 0.429 1. 0.38 0.429
NB
NB NB 12.9 B NET NERNBLn1 SWL 732 1047 -
NB 12.9 NET NERNBLn1 SWL - 732 1047 - 0.33 0.429 5) - 12.9 11 - 8 8
NB 12.9 8 12.9 8 10.7 10.7 10.7 10.7 10.7 10.7 10.7 10.7
NB 129 8 129 8 18 9 19 1047 1047 1047 1048 1049 1049 1049 1049 1049 1049 1049 1049
NB 8 12.9 8 B mt NET NERNBLnt SWL - 732 1047 - 0.38 0.429 5) - 12.9 11 - 8 B
mt NET NERNBL11 SWL - 732 1047 - 732 0429 - 129 11 - 8 8
B mt NET NERNBLn1 SWL - 732 1047 - 0.38 0.429 - 12.9 11 - 8 8
mt NET NERNBLn1 SWL - 732 1047 - 0.38 0.429 - 12.9 11 - 8 8
mt NET NERNBLn1 SWL - 732 1047 - 0.38 0.429 - 12.9 11 - 8 B
- 732 - 0.38 s) - 12.9
s) - 0.38 - 12.9
s) - 12.9 - B
B
O(vah) 19

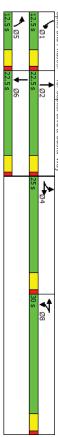
Tumwater Transportation Master Plan SCJ Alliance

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

Projected 2022 without improvements
PM Peak Hour

	•	ţ	4	1	†	~	٠	→	•	•	←	•
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	_#	\$ ₩		JI.	\$		_#	≯ }		_#	→	
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
Storage Lanes	_		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)		684			631			2019			1179	
Travel Time (s)		15.5			14.3			45.9			26.8	
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 (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	0%	0%	0%
Shared Lane Traffic (%)	10%			10%								
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	
Protected Phases	4	4		00	00		5	2		_	6	
Permitted Phases												
Detector Phase	4	4		00	00		5	2		_	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	22.0	22.0		22.0	22.0		12.5	22.0		12.5	22.0	
Total Split (s)	25.0	25.0			30.0		12.5	22.5		12.5	22.5	
Total Split (%)	27.8%	27.8%			33.3%		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	
All-Red Time (s)	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	
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 Optimize?							Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Max		None	Max	
Intersection Summary												
Area Type:	Other											
Cycle Length: 90												
Actuated Cycle Length: 82.5												
Natural Cycle: 140												
Control Type: Actuated-Uncoordinated	oordinated											

Splits and Phases: 18: Capitol Blvd & Custer Way



Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

HCM 2010 Signalized Intersection Summary 18: Capitol Blvd & Custer Way

Projected 2022 without improvements
PM Peak Hour

			•	•		,	_	_		1	4	4
Movement	EBL	EBT ,	EBR	WBL .	WBT	WBR	NBL .	NBT .	NBR .	SBL	SBT	SBR
Lane Configurations	_#	Ž÷ ¥		_#	€		_H	₹		s	₹	
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	ω	8	18	5	2	12	_	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1900	1881	1881	1900	1881	1881	1900	1900	1900	1900
Adj Flow Rate, veh/h	200	783	0	439	550	=======================================	22	461	256	28	589	183
Adj No. of Lanes	_	2	0	_	_	0	_	2	0	_	2	
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	
Cap, veh/h	419	880	0	535	549	===	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	0.21	0.05	0.22	0.22
Sat Flow, ven/n	1/92	3/62		1/92	1838	3/	1/92	2224	1221	1810	2/15	842
Grp Volume(v), ven/n	1792	1881	0 0	1792	0 0	1875	1792	1787	1665	1810	1805	1751
Q Serve(g s), s	8.2	17.2	0.0	19.4	0.0	25.5	1.0	17.6	17.7		18.5	18.5
Cycle Q Clear(g_c), s	8.2	17.2	0.0	19.4	0.0	25.5	1.0	17.6	17.7	1	18.5	18.5
Prop In Lane	1.00		0.00	1.00		0.02	1.00		0.74	1.00		0.48
Lane Grp Cap(c), veh/h	419	880	0	535	0	560	68	377	351	82	394	382
V/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
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	100	1.00	1.00	1.00	1.00
Upstream Filter(I)	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
Incr 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.
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	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.
LIGIPLOS	(2		-		ŀ	-		г	-	2	
Approach Vol, ven/h		28,			000			7/ 1			008	
Approach Los		39.6			54.8			76.1			/6.4	
Approach LUS		_						г			г	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	_	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.4	22.5		24.5	7.8	23.1		30.0				
Change Period (Y+Rc), s		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				
Max Q Clear Time (g_c+l1), s		19.7		19.2	3.0	20.5		27.5				
Green Ext Time (p_c), s	0.0	0.0		0.8	0.0	0.0		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			59.9									
HCM 2010 LOS			ш									

Tumwater Transportation Master Plan SCJ Alliance

Lanes, Volumes, Timings
19: Cleveland Ave & Custer Way/North St

Projected 2022 without improvements
PM Peak Hour

1 1 1 1 0 225 25 Yes 25 Yes 207 631 2207 14.3 5.0.2 5.0.2 1.93 0.93 0.93 0.93 0.93 0.93 1.94 1.96 1.96 1.96 1.96 2 2 8 6 6 6 8 2 2 2 8 6 6 6 8 3 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	1 1 1 1 1 1 25 25 25 25 25 25 26 20 20 20 20 20 20 20 20 20 20 20 20 20	25 Yes 30 631 2207 14.3 9.93 0.93 0.93 0.93 1% 1% 1% 1% 1% 22 2 8 6 6 2 2 2 8 6 6 6.0 6.0 8.0 6.0 6.0 22 0 22.0 22.0 22.0 22.0 22.0 22.0 22
Yes 30 431 2207 14.3 1.8 0.93 0.93 1.93 1.93 1.93 1.93 1.93 1.93 1.93 1	Yes 30 Yes 30 Yes 30 Yes 631 2207 14.3 2207 14.3 50.2 30.93 0.93 0.93 0.93 0.93 1% 1% 1% 1% 1% 1% 1% 1% 1% 1% 1% 1% 1%	Yes 30 631 2207 14.3 50.2 19.3 0.93 0.93 0.93 1% 1% 1% 1% 1% 1% 1% 1% 1% 1% 1% 1% 6 6 6 6 6 80 6 6 2 2 2 8 6 6 6 6 80 60 80 60 60 22.0 22.0 22.0 22.0 22.0 22.0 22.0 22.0
30 30 30 30 31 31 32 114.3 1293 193 193 193 193 194 175 18 176 18 18 18 18 18 18 18 18 18 18 18 18 18	Solution (Solution (Soluti	Split NA pm+ov Split NA 2207 14.3 1.93 0.93 0.93 0.93 0.93 1.93 1.93 1.93 1.93 1.93 1.93 1.93 1
14.3 50.2 10.93 0.93 0.93 0.93 1% 1% 1% 1% 1% NA pm+ov Split NA 2 8 6 6 2 8 6 6 6.0 8.0 6.0 6.0 22.0 22.0 22.0 24.0 22.0 22.0 22.0 24.0 22.0 22.0 22.0 25.7% 244% 244% 4.0 4.0 4.0 1.0 1.0 1.0 1.0 0.0 0.0 0.0 0.0 5.0 5.0 5.0 5.0 None None None None	14.3 50.2 10.93 0.93 0.93 0.93 0.93 1% 1% 1% 1% 1% 1% 1% Split NA pm+ov Split NA 2 2 2 8 6 6 6.0 6.0 8.0 6.0 6.0 22.0 22.0 22.0 22.0 24.0 24.0 22.0 22.0 24.0 24.0 22.0 22.0 24.0 24.0 24.9 24.4% 24.4% 1.10 1.0 1.0 1.0 0.0 0.0 0.0 0.0 5.0 5.0 5.0 5.0 5.0 None None None None None	14.3 50.2 10.93 0.93 0.93 0.93 10.93
0.93 0.93 0.93 0.93 1.93 1.93 1.93 1.93 1.93 1.93 1.93 1	0.93 0.93 0.93 0.93 0.93 1.93 1.93 1.93 1.93 1.93 1.93 1.93 1	0.93 0.93 0.93 0.93 1.93 1.93 1.93 1.93 1.93 1.93 1.93 1
1% 1% 1% 1% 1% NA pm+ov Split NA 2 8 6 6 2 8 6 6 2 8 6 6 2 8 6 6 2 2 8 6 6 2 2 8 6 6 2 2 8 6 6 2 2 8 6 6 2 2 8 6 6 2 2 2 2 2 22.0 22.0 22.0 22.0 2 24.0 22.0 22.0 22.0 2 2 26.7 24.4% 24.4% 24.4% 4	1% 1% 1% 1% 1% 1% 1% Split NA pm+ov Split NA 2 2 8 6 6 2 2 8 6 6 6 6 6 6 6 6 6 6 6 6 220 22 8 0 6 6 220 220 220 220 240 240 220 220 220 240 240 240 220 220 220 240 40 40 40 40 40 10 1.0 1.0 1.0 1.0 0.0 0.0 0.0 0.0 5.0 5.0 5.0 5.0 5.0 None None None None None	1% 1% 1% 1% 1% 1% Split NA pm+ov Split NA 2 2 8 6 6 2 2 8 6 6 6 6 80 6.0 6.0 22.0 22.0 22.0 22.0 240 240 220 22.0 22.0 240 40 40 40 40 1.0 1.0 1.0 1.0 0.0 0.0 0.0 0.0 0.0 5.0 5.0 5.0 5.0 None None None None None
NA pm+ov Split NA 2 8 6 6 2 2 2 8 6 6 6 6 6 80 60 60 22.0 22.0 22.0 24.0 22.0 22.0 22.0 26.7% 24.4% 24.4% 24.4% 4.0 1.0 1.0 1.0 1.0 0.0 0.0 0.0 0.0 5.0 5.0 5.0 5.0 None None None	Split NA pm+ov Split NA 2 2 8 6 6 2 2 8 6 6 6.0 6.0 8.0 6.0 6.0 6.0 8.0 6.0 6.0 6.0 2.0 2.2 2.0 22.0 22.0 22.0 22.0 22.0 22.0 22.0 24.0 22.0 22.0 22.0 22.0 26.7% 24.4% 24.4% 24.4% 24.4% 4.0 4.0 4.0 4.0 4.0 1.0 1.0 1.0 1.0 1.0 0.0 0.0 0.0 0.0 0.0 5.0 5.0 5.0 5.0 5.0 None None None None None	Split NA pm+ov Split 2 2 8 6 2 2 8 6 6.0 6.0 8.0 6.0 6.0 6.0 8.0 6.0 2.0 2.2 2.0 22.0 22.0 22.0 22.0 22.0 22.0 22.0 22.0 22.0 24.0 24.0 22.0 24.0 4.0 4.0 4.0 4.0 4.0 4.0
NA pm+ov Split NA 2 8 6 6 2 8 6 6 6.0 8.0 6.0 6.0 22.0 22.0 22.0 24.0 22.0 22.0 22.0 24.0 24.4% 24.4% 24.4% 24.4% 1.0 1.0 1.0 1.0 0.0 0.0 0.0 5.0 5.0 5.0 None None None	Split NA pm+ov Split NA 2 2 8 6 6 2 2 8 6 6 6.0 6.0 8.0 6.0 6.0 6.0 8.0 6.0 6.0 6.0 2.0 2.0 2.0 22.0 22.0 22.0 22.0 22.0 22.0 22.0 24.0 24.0 22.0 22.0 22.0 26.7% 24.4% 24.4% 24.4% 4.0 4.0 4.0 4.0 1.0 1.0 1.0 1.0 0.0 0.0 0.0 0.0 5.0 5.0 5.0 5.0 None None None None	Split NA pm+ov Split 2 2 8 6 2 2 8 6 6.0 6.0 8.0 6.0 6.0 6.0 8.0 6.0 2.0 2.0 22.0 22.0 22.0 22.0 22.0 22.0 24.0 24.0 22.0 22.0 24.0 22.0 22.0 22.0 26.7% 24.4% 24.4% 24.4% 4.0 4.0 4.0 4.0 1.0 1.0 1.0 0.0 0.0 0.0 0.0 0.0 5.0 5.0 5.0 5.0 None None None None None
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2 8 6 6 60 80 60 60 22.0 22.0 22.0 24.0 22.0 22.0 22.0 26.7% 24.4% 24.4% 24.4% 4.0 4.0 4.0 4.0 1.0 1.0 1.0 0.0 0.0 0.0 5.0 5.0 5.0 5.0 None None None	2 2 8 6 6 6.0 6.0 8.0 6.0 6.0 22.0 22.0 22.0 22.0 24.0 24.0 22.0 22.0 22.0 25.7% 26.7% 24.4% 24.4% 24.4% 4.0 4.0 4.0 4.0 4.0 1.0 1.0 1.0 1.0 1.0 0.0 0.0 0.0 0.0 5.0 5.0 5.0 5.0 5.0 None None None None None	2 2 8 6 60 60 80 60 220 220 220 240 240 220 220 267% 26.7% 24.4% 24.4% 4.0 1.0 1.0 1.0 1.0 1.0 1.0 0.0 0.0 0.0 5.0 5.0 5.0 5.0 None None None
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22.0 22.0 22.0 22.0 22.0 22.0 22.0 22.0	22.0 22.0 22.0 22.0 22.0 24.0 24.0 24.0	22.0 22.0 22.0 22.0 22.0 24.0 24.0 27.0 27.0 27.0 27.0 27.0 27.0 27.0 27
240 220 220 220 26.7% 24.4% 24.4% 24.4% 24.4% 24.4% 40 4.0 1.0 1.0 1.0 0.0 0.0 0.0 5.0 5.0 5.0 5.0 5.0 None None None	240 240 220 220 220 267% 26.7% 26.7% 24.4% 24.4% 24.4% 24.4% 24.4% 24.4% 24.6%	240 240 220 220 26.7% 26.7% 24.4% 24.4% 4.0 4.0 4.0 1.0 1.0 1.0 1.0 1.0 0.0 0.0 0.0 0.0 0.0 5.0 5.0 5.0 5.0 None None None None
26.7% 24.4% 24.4% 4.0 4.0 4.0 4.0 1.0 1.0 1.0 1.0 0.0 0.0 0.0 0.0 5.0 5.0 5.0 5.0 None None None	26.7% 26.7% 24.4% 24.4% 24.4% 4.0 4.0 4.0 4.0 4.0 1.0 1.0 1.0 1.0 1.0 1.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5	26.7% 26.7% 24.4% 24.4% 4.0 4.0 4.0 1.0 1.0 1.0 1.0 0.0 0.0 5.0 5.0 5.0 5.0 5.0 Cher
4.0 4.0 4.0 4.0 1.0 1.0 1.0 1.0 0.0 0.0 0.0 0.0 5.0 5.0 5.0 5.0 None None None None	40 40 40 40 40 10 1.0 1.0 1.0 1.0 0.0 0.0 0.0 0.0 5.0 5.0 5.0 5.0 5.0 None None None None	4.0 4.0 4.0 4.0 4.0 4.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 5.0 5.0 5.0 5.0 5.0 5.0 4.0 Mone None Other
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None None None	None None None None Other	None None None None Other
None None None	None None None None Other	None None None None Other
	Other	Other

Splits and Phases: 19: Cleveland Ave & Custer Way/North St

♦ 02	₹26	1 1 1 1 1 1 1 1 1 1	⋬ ∞8
24s	22 s	22 s	22 s

Turnwater Transportation Master Plan Synchro 9 Report SCJ Alliance 6/10/2016

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

Projected 2022 without improvements

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		-	-34	_#	₩	1	_#	⊅	;	.	2 →	-1
Future Volume (veh/h)	л D	282	700	1 5	200	70 20	530	155	7 5	110	210	115
Number	ъ G	2	12	_ ;	6	16	ω	ω .	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1881	1881	1881	1900	1881	1881	1900	1863	1863	1863
Adj Flow Rate, veh/h	59	414	645	16	323	75	570	167	16	118	333	္မယ္သ
Adj No. of Lanes	2 -	2 -	2 -	2 -	2 -	0	2	2 -	0	2 -	3 _	2
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
Cap. veh/h	88 1	400	632	341	281	65 -	653	308 -	38 -	338	355	302
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
Grp Volume(v), veh/h	59	414	645	16	0	398	570	0	183	118	333	ယ္သ
Grp Sat Flow(s),veh/h/ln	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	3.8	0.0	0.8	n 51	15.7	7 -7
Prop In Lane	1.00		1.00	1.00	Ċ	0.19	1.00	9.0	0.09	1.00	0.5	1.00
Lane Grp Cap(c), veh/h	381	400	632	341	0	347	653	0	338	338	355	302
V/C 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
HCM Platoon Ratio	100	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.6	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
%ile RackOfO(50%) veh/in	1.0	15.0	22 7	0.0	0.0	17.6	7.0	0.0	0.0	2.6	11.0	0.0
LnGrp Delay(d),s/veh	28.8	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	С		F	D		С	С	Е	0
Approach Vol, veh/h		1118			414			753			484	
Approach LOS		п 2			F 127.1			J #			П .	
Timer	_	>	ىد	4	ייכ	6	7	x				
Assigned Phs		2		4		6		∞				
Phs Duration (G+Y+Rc), s		24.0		22.0		22.0		21.3				
Change Period (Y+Rc), s		5.0		5.0		5.0		5.0				
Max Green Setting (Gmax), s		19.0		17.0		17.0		17.0				
Max U Clear Time (g_c+II), S		21.0		17.7		19.0		5.8				
Green Ext Time (p_c), s		0.0		0.0		0.0		0.5				
Intersection Summary												
HCM 2010 Ctrl Delay			69.5									
HCM 2010 LOS			ш									
Notes												

Tumwater Transportation Master Plan SCJ Alliance

HCM 2010 TWSC 20: Hoadly St & North St

Projected 2022 without improvements

LCM FAILE FOS	HCM Long LOS	HCM Control Delay (s)	HCM Lane V/C Ratio	Capacity (veh/h)	Minor Lane/Major Mvmt	HCM LOS	HCM Control Delay, s	Approach	Stage 2	Stage 1	Mov Cap-2 Maneuver	Mov Cap-1 Maneuver	Platoon blocked, %	Stage 2	Stage 1	Pot Cap-1 Maneuver	Follow-up Hdwy	Critical Hdwy Stg 2	Critical Hdwy Stg 1	Critical Hdwy	Stage 2	Stage 1	Conflicting Flow All	Major/Minor	Mvmt Flow	Heavy Vehicles, %	Peak Hour Factor	Grade, %	Veh in Median Storage, #	Storage Length	RT Channelized	Sign Control	Conflicting Peds, #/hr	Future Vol, veh/h	Traffic Vol, veh/h	Movement	ппевау, эмен		Intersection
		12.7	0.029	483	NBLn1		=	EB				999				999	2.209			4.11			580	Major1	52	_	87					Free	0	45	45	EBL		7	
1	> 0	00 00	0.052	999	EBL								,	ï		í	,	,	,	ï	,		0		379	_	87	0	0			Free	0	330	330	EBT			
1	> <	0			EBT								,			í		í	,		,		0		0	_	87		,		None	Free	0	0	0	EBR			
					EBR V							_				_	2.			_				Ma								_				V			
> 1	> -	20	0.01	1185	WBL 1		0.2	WB				1185		ř		1185	2.209	÷		4.11			379	Najor2	=	_	87						0	10	10	VBL 1			
1	> 0	0			WBT									í		ï		ï		í			0		523	_	87	0	0			Free	0	455	455	WBT			
			- 0.193	,	WBR SBLn1									í		í		·		í			0		57	_	87				None	Free	0	50	50	WBR			
3 () i	23.3	93	244	n1	В	12.7	NB	477	531	183	183		501	569	202	3.5	6.1	6.1	7.1	584	483	1067	Minor1	0	0	87					Stop	0	0	0	NBL			
									485		201	201				N 3		5.5			603		1086					0				Ş		2		NBT			
												672		·		672	.ω ω			6.2			379		1		87					S	0	10	10	NBR			
						C	23.3	SB	515	474	185	185		564	507	202	3.5	6.1	6.1	7.1	490	575	1065	Minor2	29	0	87					Stop	0	25	25	SBL			
									519	499	209	209		556	506	227	4	5.5	5.5	6.5	483	575	1058		_	0	87	0	0			Stop	0	_	_1	SBT			
												537			,	537	3.3	,	,	6.2			552		17	0	87				None	Stop	0	15	15	SBR			

Synchro 9 Report 6/10/2016

Tumwater Transportation Master Plan SCJ Alliance

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	All
Denied Del/Veh (s)	0.0	0.0	0.2	0.2	0.3	0.1
Total DelWeh (s)	1 /	ں س	7 20	6.3	1 6	4 6

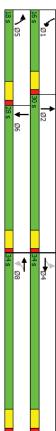
Tumwaler Transportation Master Plan
SCJ Alliance SimTraffic Report

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

Projected 2022 without improvements

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	\	ļ	4	1	†	/	۶	→	•	•	←	•
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		\$ >			₽		_#	→		J,	♣	
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	175		0	150		0
Storage Lanes	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)		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	
Protected Phases		4			00		5	2		_	6	
Permitted Phases	4			00								
Detector Phase	4	4		8	8		5	2		_	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		5.0	8.0		5.0	8.0	
Minimum Split (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		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	
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	
Total Lost Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Min		None	Min	
Intersection Summary												
	Other											
Cycle Length: 80												
Actuated Cycle Length: 80												
Natural Cycle: 80												
Control Type: Actuated-Uncoordinated	ordinated											

Splits and Phases: 22: E St & Capitol Blvd



Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

HCM 2010 Signalized Intersection Summary 22: E St & Capitol Blvd

Projected 2022 without improvements
PM Peak Hour

Movement													
EBI EBI EBR W 120 95 280 1 120 95 280 1 120 95 280 1 120 95 280 1 120 95 280 1 120 95 280 1 120 0 0 0 0 100 1.00 1.00 1 100 1.00 1.00		1	Ļ	1	1	†	<u> </u>	۶	→	*	•	←	4
120 95 280 1 120 95 280 1 120 95 280 1 120 95 280 1 120 0 0 0 100 1.00 1.00 1 100 1.00 1.00 1 140 110 0 1 100 181 1900 11 140 110 0 1 1 0 1 1 0 1 1 0 1 1 0 1 1 0 1 1 0 1 1 0 1 1 0 1 1 0 1 1 0 1 1 0 1 1 0 1 1 0 1 1 0 1 1 0 1 1 0 0 0 1 1 1 0 0 0 1 1 1 0 0 0 1 1 1 0 0 0 1 1 1 0 0 0 1 1 1 0 0 0 1 1 1 0 0 0 1 1 1 0 0 0 1 0 1	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
120 95 280 1 120 95 280 1 120 95 280 1 120 95 280 1 120 95 280 1 120 0 0 0 0 100 1.00 1.00 1.00 1 1100 1.00 1.	Lane Configurations		\$			÷		H	↑		_#	÷	
120 95 280 1 100 0 0 0 100 1.00 1.00 1 100 1.00 1.	Traffic Volume (veh/h)	120	%	280	135	100	140	235	550	145	205	760	85
7 4 14 7 0 0 0 0 1100 1100 1100 1 1100 1200 1881 1900 18 140 110 1 0 1 140 1 1 0 0 1 140 1 1 0 0 1 150 1 1 0 0 1 160 1 1 0 0 1 17 0 0 1 181 1900 18 181 1900 19 1 0 0 1 0 0 1 0 0 0 255 189 0 0 0 257 576 0 0 0 250 0 0 0 0 1141 0 0 0 0 1141 0 0 0 0 1154 0 0 0 0 1155 0 0 0 0 0 1156 0 0 0 0 1157 0 0 0 0 1158 0 0 0 0 0 1159 0 0 0 0 0 159 0 0 0 0 0 150 0 0 0 150 0 0 0 0 150 0 0 0 0 150 0 0 0 0 150 0 0 0 0 150 0 0 0 0 150 0 0 0 0 150 0 0 0 0 150 0 0 0 0 150 0 0 0 0 150 0 0 0 0 150 0 0 0 150 0 0 0 0 150 0 0 0 0 150 0	Future Volume (veh/h)	120	95	280	135	100	140	235	550	145	205	760	85
100 0 0 0 100 1100 1100 1100 1100 1100	Number	7	4	14	ω	00	18	57	2	12	_	6	16
100 100 100 1 100 100 100 1 1900 1881 1900 19 140 110 0 1 0 0 1 0 1 0 0 1 0 1 0 0 1 0 0 0 86 0.86 0.86 0 1 1 1 1 255 189 0 0 5 577 57 0 0 0 5 577 57 0 0 0 1 141 0 0.0 0 0 0 144 0 0 0 1 144 0 0 0 1 145 0 0 0 0 155 0.00 0.00 0 155 0.00 0.00 0 155 0.00 0.00 0 150 0 0 0 0 100 0 0 0 0 100 0	Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	
1100 1.00 1.00 1900 1881 1900 140 1110 0 0 0.86 0.86 0.86 0.81 0.86 0.86 0.81 189 0 0.33 0.33 0.00 5577 578 0 0.00 0.0 0.0 14.1 0.0 0.0 0.0 14.1 0.0 0.0 0.0 14.1 0.0 0.0 0.0 0.55 0.00 0.0 0.55 0.00 0.00	Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
1900 1881 1900 1801 1900 100 100 100 100 100 100 100 100	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
140 110 0 0.86 0.86 0.86 0.86 1 1 1 265 189 0 0.33 0.33 0.00 577 576 0 0.00 0.0 1154 0 0 0.56 0.00 0.454 0 0 0.55 0.00 0.00 0.55 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.	Adj Sat Flow, veh/h/ln	1900	1881	1900	1900	1900	1900	1881	1881	1900	1881	1881	1900
0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Adj Flow Rate, veh/h	140	110	0	157	116	163	273	640	169	238	884	99
0.86 0.86 0.86 0.86 0.86 0.86 0.86 0.86	Adj No. of Lanes	0	_	0	0	_	0	_	2	0	_	2	
265 19 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	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
2.65 189 0 0.05 189 0 0.00 0.00 0.00 0.154 0.00 0.00 0.164 0.00 0.00 0.55 0.00 0.00 0.55 0.00 0.00	Percent Heavy Veh, %	_	_	_	0	0	0	_	_	_	_	_	
0.33 0.33 0.00 0.37 576 0 0.250 0 0 0.1154 0 0 0.100 0.00 0.14.1 0.0 0.0 0.56 0.00 0.55 0.00 0.00 0.55 0.00 0.00 0.55 0.00 0.00	Cap, veh/h	265	189	0	233	153	191	314	934	246	278	1016	114
577 578 0 250 0 0 1154 0 0 14.1 0.0 0.0 14.1 0.0 0.0 14.1 0.0 0.0 0.55 0.00 0.00 0.55 0.00 0.00 0.55 0.00 0.00	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	0.37
250 0 0 0 1154 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Sat Flow, veh/h	577	576	0	507	468	582	1792	2800	738	1792	3241	363
1154 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Grp Volume(v), veh/h	250	0	0	436	0	0	273	408	401	238	487	496
14.1 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	Grp Sat Flow(s),veh/h/ln	1154	0	0	1557	0	0	1792	1787	1751	1792	1787	1817
14.1 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	U Serve(g_s), 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
454 0 00 454 0 0 0.55 0.00 0.00 553 0 0 1.00 1.00 1.00 1.00 0.00 0.00 1.00 0.00 0.00 1.00 0.00 0.00 1.00 0.00 0.00 1.00 0.0	Cycle U Clear(g_c), s	0.54	0.0	0.0	7.61	0.0	0.0	10.9	14.5	0 43	1 9.5	19.0	19.0
0.55 0.00 0.00 0.55 0.00 0.00 1.00 1.00 1.00 1.00 0.00 0.00	Lane Grn Can(c) veh/h	454	o	0.00	577	0	0.3/	314	506	584	278	560	570
553 0 0 1.00 1.00 1.00 1.00 0.00 0.00 1.00 0.00 0.00 1.0 0.0 0.0 1.0 0.0 0.0 1.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 220 0.0 0.0 C C 250 220 C C 250 220 C C 3 1 2 3 1 2 3 1 2 3 1 2 3 1 5 4.5 4.5 4.5 4.5 6.6 6.6 6.6	V/C Ratio(X)	0.55	0.00	0.00	0.76	0.00	0.00	0.87	0.68	0.69	0.86	0.87	0.87
1.00 1.00 1.00 1.00 1.00 1.00 1.00 0.00 0.00 0.00 0.00 1.00 0	Avail Cap(c_a), veh/h	553	0	0	689	0	0	328	619	606	280	570	580
1.00 0.00 0.00 1.20,9 0.0 0.00 1.0 0.0 0.0 1.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 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
20.9 0.0 0.0 20.9 0.0 0.0 20.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uln 4.5 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	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
Mn 45 00 00 220 0.0 0.0 C 250 220 0.0 0.0 C 250 C 250 C 250 C 220 C 250 C 250 C 250 C 250 C 250 C 250 C 3 1 2 3 1 2 3 A 5 4.5 A 5 4.5 A 5 5 5 5 A 5 6 6 6	Incr Delay (dz), siven	2 -	0.0	0.0	9.0	0.0	0.0	20.6	3.0	3.1	21.9	0.5	13.3
220 0.0 0.0 C C 250 22.0 C C C C C C C C C C C C C C C C C C C	%ile RackOfO(50%) veh/in	Д С	0 0	0.0	20 00	0.0	0.0	7.0	7.6	75	6.0	11 4	- 1
C 250 22.0 C C C C C C C C C C C C C C C C C C C	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
250 220 C C 1 2 3 1 2 3 1 2 2 3 1 2 4.5 4.5 20.).s 11.5 25.5 (H), s 11.5 25.5 (H), s 11.5 16.6 0.0 6.6	LnGrp LOS	С			С			D	С	С	D	D	
22.0 C C 1 2 3 1 2 2, s 15.9 29.1 s 4.5 4.5 ax), s 11.5 25.5 HD), s 11.5 16.6 0.0 6.6	Approach Vol, veh/h		250			436			1082			1221	
C 2 3 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Approach Delay, s/veh		22.0			26.9			30.8			40.2	
1 2 3 1 2 2 , s 15.9 29.1 ax), s 11.5 25.5 an), s 11.5 25.5 11), s 11.5 16.6	Approach LOS		С			С			С			D	
1 2 ,s 15.9 29.1 ax),s 11.5 25.5 an),s 11.5 16.6 0.0 6.6	Timer	_	2	ω	4	5	6	7	ω				
s 15.9 29.1 s 4.5 4.5 ax), s 11.5 25.5 HD), s 11.5 16.6 0.0 6.6	Assigned Phs	_	2		4	5	6		∞				
s 4.5 4.5 ax), s 11.5 25.5 hT), s 11.5 16.6 0.0 6.6	Phs Duration (G+Y+Rc), s	15.9	29.1		28.6	17.4	27.6		28.6				
ax), s 11.5 25.5 +I1), s 11.5 16.6 0.0 6.6	Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
-I1), s 11.5 16.6 1 0.0 6.6	Max Green Setting (Gmax), s	11.5	25.5		29.5	13.5	23.5		29.5				
0.0 6.6	Max Q Clear Time (g_c+l1), s	11.5	16.6		16.1	12.9	21.0		21.2				
Intersection Summan	Green Ext Time (p_c), s	0.0	6.6		3.9	0.1	2.1		2.9				
intersection Sammary	Intersection Summary												
HCM 2010 Ctrl Delay 33.3	HCM 2010 Ctrl Delay			33.3									
	HCM 2010 LOS			С									

Tumwater Transportation Master Plan SCJ Alliance

HCM 2010 TWSC 23: Cleveland Ave & South St

Projected 2022 without improvements
PM Peak Hour

HCM 95th %tile Q(veh)	HCM Lane LOS	HCM Control Delay (s)	HCM Lane V/C Ratio	Capacity (veh/h)	Minor Lane/Major Mvmt	HCM LOS	HCM Control Delay, s	Approach	Stage 2	Stage 1	Mov Cap-2 Maneuver	Mov Cap-1 Maneuver	Platoon blocked, %	Stage 2	Stage 1	Pot Cap-1 Maneuver	Follow-up Hdwy	Critical Hdwy Stg 2	Critical Hdwy Stg 1	Critical Hdwy	Stage 2	Stage 1	Conflicting Flow All	Major/Minor	MALIFICA	Heavy venicies, %	Peak Hour Factor	Grade, %	Veh in Median Storage, #	Storage Length	RT Channelized	Sign Control	Conflicting Peds, #/hr	Future Vol, veh/h	Traffic Vol, veh/h	Movement	III. Delay, siveli 0.5		
					NBT	C	16.1	WB	498	447	146	146		532	447	156	3.5	5.8	5.8	6.8	574	722	1296	Minor1	0	۰ ح	. 88	0	0	0		Stop	0	5	5	WBL	ز	n	
- 0.2 0.1	C	- 16.1 9.	- 0.066 0.02	- 346 879	NBRWBLn1 SBL							639				639	3.3			6.9			364		_	ů c	88				None	Stop	0	15	15	WBR			
	A A				SBT SBT		0	NB															0	Major1	/ 10	1		0				Free	0	630	630	NBT			
)	ω															0		=		. 88				- None		0			「 NBR			
							0.5	SB				879				879	2.21			4.12			727	Major2	23		88						0	20	20	SBL			
																							0		100/	- 2	. 88	0	0		None	Free	0	930	930	SBT			

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Tumwater Transportation Master Plan SCJ Alliance

HCM 2010 TWSC 24: Linwood Ave & 7th Ave

Projected 2022 without improvements
PM Peak Hour

HOM 95th %tile O(veh)	HCM Lang LOS	HCM Control Delay (s)	HCM Lane V/C Ratio	Capacity (veh/h)	Minor Lane/Major Mvmt	HCM LOS	HCM Control Delay, s	Approach	Stage 2	Stage 1	Mov Cap-2 Maneuver	Mov Cap-1 Maneuver	Platoon blocked,	Stage 2	Stage 1	Pot Cap-1 Maneuver	Follow-up Hdwy	Critical Hdwy Stg 2	Critical Hdwy	Critical Hdwy	Stage 2	Stage 1	Conflicting Flow All	Major/Minor	Mvmt Flow	Heavy Vehicles, %	Peak Hour Factor	Grade, %	Veh in Median Storage	Storage Length	RT Channelized	Sign Control	Conflicting Peds, #/hr	Future Vol, veh/h	Traffic Vol, ve	Movement	Int Delay, s/veh	TI KOLOGORIOTI
ilo Okobi	2	Delay (s)	C Ratio))	lajor Mvmt		Delay, s				aneuver	aneuver	ed, %			neuver	wy	Stg 2	Stg 1		10		JW All			es, %	ctor		n Storage, #	#	ed		eds, #/hr	'nΛh	h/h		eh 4.2	
> >	Þ	9		901	NBLn1		<u>-1</u>	EB				1030				1030	2.227			4.13			532	Major1	22	ω	93					Free	0	20	20	EBL	2	
2 2	⊳	8.6	0.021	1030	EBL					,		,		,				,					0		151	ω	93	0	0		,	Free	0	140	140	EBT		
)	Þ	0			EBT									·			,						0		0	ω	93				None	Free	0	0	0	EBR		
		í			EBR																			<														
> >	Þ	7.5	0.001	1436	WBL		0	WB		,		1436		,		1436	2.209	,		4.11		,	151	Najor2	_	_	93				ï	Free	0	_	_	WBL		
	⊳	0			WBT					,		,		,		,						,	0		306	_	93	0	0		,	Free	0	285	285	WBT		
			- 0		WBR SBLn1					·													0		226	_	93				None	Free	0	210	210	WBR		
ى <u>-</u> د	0	20	0.428	415	ľn1																			≦														
						Þ	9	NB	585	793	379	379		606	812	400	3.5	6.1	6.1	7.1	432	194	626	nor1	0	0	93					Stop	0	0	0	NBL		
									527	727	345	345		528	744	353	4	5.5	5.5	6.5	534	194	728		0	0	93	0	0			Stop	0	0	0	NBT		
												901		·		901	ယ ယ			6.2			151		_	0	93				None	Stop	0	_	_	NBR		
						C	20	SB	790	597	396	396		810	611	404	3.509	6.11	6.11	7.11	194	422	616	Minor2	156	_	93					Stop	0	145	145	SBL		
									725			397						5.51	5.51	6.51	194		616		0	_	93	0	0			Stop		0	0	SBT		
												636				636	3.309			6.21			419		22	_,	93					Stop	_	20	20	SBF		

Tumwater Transportation Master Plan SCJ Alliance

HCM 2010 AWSC 25: Linwood Ave & 2nd Ave

Projected 2022 without improvements PM Peak Hour

Intersection												
Intersection Delay, s/veh	38.2											
Mouramont	TDII.	ED.	ПВТ	E B D	MDII	MDI	MDT	MBD	NDI	ND	NDT	NB
Traffic Vol. vah/h	0 6	בט ב	155	110	5	125	245	5		130	155	9
Future Vol. veh/h	0 0	50	155	110	0 0	135	265	8 8	0 0	120	155	90 >
Peak Hour Factor	0.92	0.89	0.89	0.89	0.92	0.89	0.89	0.89	0.92	0.89	0.89	0.89
Heavy Vehicles, %	2	_	_	_	2	_	_	_	2	0	0	
Mvmt Flow	0	56	174	124	0	152	298	67	0	135	174	101
Number of Lanes	0	_	_	0	0	_	_	0	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		31.3				43.2				25.8		
HCM LOS						г						
Lane		NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2			
Vol Left, %		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										
Traffic Vol by Lane		120	245	50	265	135	325	95	340			
LTVol		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										
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		С	D	В	D	С	П	C	П			
			л	Ол	٥,	1 9	0 4		10.2			

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Tumwater Transportation Master Plan SCJ Alliance

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	_	_	_	
Mvmt Flow	0	107	219	163	
Number of Lanes	0	_	_	0	
Approach					
Opposing Approach		SB			
		NB SB			
Opposing Lanes		SB NB			
Opposing Lanes Conflicting Approach Left		SB NB			
Opposing Lanes Conflicting Approach Left Conflicting Lanes Left		SB NB 2 WB			
Opposing Lanes Conflicting Approach Left Conflicting Lanes Left Conflicting Laperoach Right		SB NB EB			
Opposing Lanes Conflicting Approach Left Conflicting Lanes Left Conflicting Approach Right Conflicting Approach Right Conflicting Lanes Right		SB NB P SB NB NB SB NB S			
Opposing Lanes Conflicting Approach Left Conflicting Lanes Left Conflicting Lapproach Right Conflicting Lanes Right HCM Control Delay		SB NB 2 WB 2 EB 2 48.4			
Opposing Lanes Conflicting Approach Left Conflicting Lanes Left Conflicting Lanes Left Conflicting Approach Right Conflicting Lanes Right HCM Control Delay HCM LOS		SB NB 2 WB 2 EB 2 48.4 E			
Opposing Lanes Conflicting Approach Left Conflicting Lanes Left Conflicting Lanes Right Conflicting Lanes Right HCM Control Delay HCM LOS		SB NB NB VB 2 VB 2 EB 2 48.4			

Tumwater Transportation Master Plan SCJ Alliance

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

Projected 2022 without improvements PM Peak Hour

					ncoordinated	Natural Cycle: 80 Control Type: Actuated-Uncoordinated
					2.8	Actuated Cycle Length: 62.8
						Cycle Length: 70
					Other	Area Type:
						Intersection Summary
	Max	Max	None	None	None	Recall Mode
	Yes		Yes	Yes		Lead-Lag Optimize?
	Lag		Lead	Lead		Lead/Lag
	4.5	4.5	4.5	4.5	4.5	Total Lost Time (s)
	0.0	0.0	0.0	0.0	0.0	Lost Time Adjust (s)
	1.0	1.0	1.0	1.0	1.0	All-Red Time (s)
	3.5 5	3.5	3.5	3.5	3.5	Yellow Time (s)
	39.7%	67.7%	28.0%	28.0%	32.3%	Total Split (%)
	27.8	47.4	19.6	19.6	22.6	Total Split (s)
	21.5	20.0	19.5	19.5	22.5	Minimum Split (s)
	15.0	15.0	15.0	15.0	5.0	Minimum Initial (s)
						Switch Phase
	6	2	5	5	4	Detector Phase
			2	4		Permitted Phases
	6	2	5	5	4	Protected Phases
	NA	NA	pm+pt	pm+ov	Prot	Turn Type
						Shared Lane Traffic (%)
1%		1%	1%	1%	1%	Heavy Vehicles (%)
0.84	0.84	0.84	0.84	0.84	0.84	Peak Hour Factor
	43.2	60.5			11.1	Travel Time (s)
	1902	2664			489	Link Distance (ft)
	30	30			30	Link Speed (mph)
Yes				Yes		Right Turn on Red
			25		25	Taper Length (ft)
0			_	_	_	Storage Lanes
0			150	0	150	Storage Length (ft)
1900		1900	1900	1900	1900	Ideal Flow (vphpl)
280		770	165	175	155	Future Volume (vph)
280	880	770	165	175	155	Traffic Volume (vph)
	ᢌ	‡	_#	٦,	_#	Lane Configurations
SBR	SBT	NBT	NBL	EBR	EBL	Lane Group
•	+	_	ر	4	\	
	-	•	k	,	-	

Splits and Phases: 26: Capitol Blvd & Linwood Ave



Tumwater Transportation Master Plan SCJ Alliance

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

Projected 2022 without improvements
PM Peak Hour

					28.2 C			HCM 2010 Ctrl Delay HCM 2010 LOS
								Intersection Summary
		0.0	0.2	0.5		20.1		Green Ext Time (p_c), s
		25.8	4.5	8.0		8.0		Max Q Clear Time (g_c+l1), s
		23.3	15.1	18.1		42.9		Max Green Setting (Gmax), s
		4.5	4.5	4.5		4.5		Change Period (Y+Rc), s
		28.5	18.9	13.0		47.4		Phs Duration (G+Y+Rc), s
		6	5	4		2		Assigned Phs
8	7	6	5	4	ω	2		Timer
			D	A			В	Approach LOS
			49.5	4.8			19.6	Approach Delay, s/veh
			1381	1113			393	Approach Vol, veh/h
		D	D	Α	Α	В	С	LnGrp LOS
		51.4	47.6	3.8	9.4	13.5	26.5	LnGrp Delay(d),s/veh
		17.6	17.2	<u>ω</u> 1	1.4	5.7	3.0	%ile BackOfQ(50%),veh/ln
		0.0	0.0	0.0	0.0	0.0	0.0	Initial Q Delay(d3),s/veh
		33.3	29.6	0.4	0.1	0.1	1.6	Incr Delay (d2), s/veh
		18.1	18.0	3.4	9.3	13.4	24.9	Uniform Delay (d), s/veh
		1.00	1.00	1.00	1.00	1.00	1.00	Upstream Filter(I)
		1.00	1.00	1.00	1.00	1.00	1.00	HCM Platoon Ratio
		688	709	2540	569	862	537	Avail Cap(c_a), veh/h
		1.00	0.98	0.36	0.36	0.34	0.74	V/C Ratio(X)
		688	709	2540	549	607	251	Lane Grp Cap(c), veh/h
		0.49			1.00	1.00	1.00	Prop In Lane
		23.8	23.2	6.0	2.5	5.6	6.0	Cycle Q Clear(g_c), s
		23.8	23.2	6.0	2.5	5.6	6.0	Q Serve(g_s), s
		1732	1787	1787	1792	1599	1792	Grp Sat Flow(s),veh/h/ln
		685	696	917	196	208	185	Grp Volume(v), veh/h
		843	2771	3668	1792	1599	1792	Sat Flow, veh/h
		0.40	0.40	0.71	0.24	0.14	0.14	Arrive On Green
		33.4	1063	2540	549	607	25.1	Can veh/h
			2 1		1 2	1	4	Percent Heavy Veh %
		0 84	0.84	0 84	0 84 -	0 84 -	0 84	Peak Hour Factor
		000	040	٦ - ١	1 1 0	200	1 00	Adj Flow Rate; verifi
		323	1040	017	106	1881	105	Adj Sat Flow, vervn/in
		1.00	1.00	1.00	1.00	1.00	1.00	Parking Bus, Adj
		3 .	8	3	1.00	1.00	1.00	Ped-bike Adj(A_pb1)
		3 0	c	c	3	3 0	300	Pod Bilo Adi/A ph.T
		0 0	0	0 1	5 U	-	> ~	Nullipel
		16	000	ے د	л	1/2	7	Number
		280	000	770	165	175	155	Fiture Volume (veh/h)
		200	° ₽	73	1 1 6	1 H —1	<u>1</u>	Lane Configurations
		SBR	SBT	NBT	NBL	EBR	EBL	Movement
		4	4	-	-	4	١,	
		•	_	+	*	/	-	

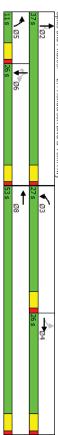
Tumwater Transportation Master Plan SCJ Alliance

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

Projected 2022 without improvements
PM Peak Hour

	/	Ļ	4	4	†	<u> </u>	٠	→	*	•	—	•
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	JI.	4 ↑		JI.	4 ↑		JI.	→	74	JI.	+	74
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		100	0		150
Storage Lanes	_		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)		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		ω	00		5	2			6	
Permitted Phases	4								2	6		6
Detector Phase	4	4		ω	00		5	2	2	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
Minimum Split (s)	24.5	24.5		9.5	24.5		9.5	24.5	24.5	24.5	24.5	24.5
Total Split (s)	26.0	26.0		27.0	53.0		11.0	37.0	37.0	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%
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
Lead/Lag	Lag	Lag		Lead			Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes			Yes			Yes	Yes	Yes
Recall Mode	Max	Max		None	Max		None	None	None	None	None	None
Intersection Summary												
Area Type: (Other											
Cycle Length: 90												
Actuated Cycle Length: 86.8												
Natural Cycle: 110												
Control Type: Actuated-Uncoordinated	ordinated											

Splits and Phases: 27: Henderson Blvd & Yelm Hwy



Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

HCM 2010 Signalized Intersection Summary 27: Henderson Blvd & Yelm Hwy

Projected 2022 without improvements
PM Peak Hour

HCM 2010 Ctrl I	Intersection	Green Ex	Max Q CI	Max Gree	Change F	Phs Dura	Assigned Phs	Timer	Approach LOS	Approach	Approach	LnGrp LOS	LnGrp De	Willo Back	Incr Delay	Uniform L	Upstream Filter(I)	HCM Plat	Avail Cap	V/C Ratio	Lane Grp	Prop In Lane	Cycle Q (Q Serve(a s), s	Gro Sat F	Cr. Volume(v)	Arrive On Green	Cap, veh/h	Percent H	Peak Hour Factor	Adj No. of Lanes	Adi Flow	Adi Sat Flow, ve	Parking P	Tillial Q (QD), Vell	Number	Future Vo	Traffic Vo	Lane Con	Movemer	
HCM 2010 Ctrl Delay	ntersection Summary	Green Ext Time (p_c), s	Max Q Clear Time (g_c+l1), s	en Setting (Gn	Change Period (Y+Rc), s	Phs Duration (G+Y+Rc), s	Phs		LOS	Approach Delay, s/veh	Approach Vol, veh/h	S	nGrp Delay(d),s/veh	Kilo BackOfO(50%) yok	ncr Delay (d2), s/veh	Iniform Delay (d), s/veh) Filter(I)	ICM Platoon Ratio	wail Cap(c_a), veh/h	//C Ratio(X)	Cap(c), veh/h	ane	Cycle Q Clear(g_c), s	a s), s	Grp Sat Flow(s), veh/h/ln	verili verili	Green	À	Percent Heavy Veh, %	ur Factor	fLanes	Adi Flow Rate, veh/h	Adi Sat Flow. veh/h/ln	Parking Rus Adi	Adi/A SET	Ob) 10h	-uture Volume (veh/h)	Traffic Volume (veh/h)	ane Configurations	nt	
		S	:+I1), s	nax), s	S), S								h/h		5									5																
								1				C	24.8	0.0	0.3	24.5	1.00	1.00	273	0.04	273	1.00	1.0	1.0	756	11	0.25	273	_	0.91	_	= !	<u></u>	100	8 0	> ~	- C	10	-31	EBL	-
		3.6	8.5	32.5	4.5	32.9	2	2	т	112.7	1011	F	113.5	20.5	87.3	32.2	1.00	1.00	447	1.13	447		21.5	21.5	1787	7007	0.25	723	_	0.91	2	813	1881	100	c	4 0	. 40	740	∌	EBT	ţ
67.9		0.0	24.5	22.5	4.5	27.0	သ	ယ				П	113.8	30.0	81.6	32.2	1.00	1.00	442	1.13	442	0.38	21.5	21.5	1764	407	0.25	166	_	0.91	0	187	1900	100	3 0	- - 4	1/0	170		EBR	4
		0.0	23.5	21.5	4.5	26.0	4	4				П	95.2	10.0	63.5	31.7	1.00	1.00	469	1.08	469	1.00	22.5	22.5	1792	1792	0.26	469	_	0.91	_	505	1881	1 .0	3 0	<i>د</i> د	460	460	H	WBL	^
		0.0	8.3	6.5	4.5	11.0	5	5	D	46.5	1197	В	11.0	4.7	0.9	10.1	1.00	1.00	1009	0.34	1009		8.9	8.9	1787	344	0.56	1769	_	0.91	2	604	1881	100	c	οα	550	550	≱	WBT	†
		1.8	15.6	21.5	4.5	21.9	6	6				В	11.0	0.0	0.9	10.1	1.00	1.00	1017	0.34	1017	0.25	9.0	9.0	1801	3 400	0.56	257	_	0.91	0	88	1900	1 .	3 0	o a	8 8	88		WBR	1
								7				П	108.6	5.7	69.0	39.6	1.00	1.00	136	0.97	136	1.00	6.3	6.3	1792	122	0.08	136	_	0.91	_	132	1881	1.00	3 0	o 0	07.1	120	_Ħ	NBL	۶
		15.6	11.0	48.5	4.5	53.0	8	8	ш	57.1	324	С	21.7	2 0	0.3	21.4	1.00	1.00	712	0.31	622		6.5	6.5	1881	100	0.33	622	_	0.91	_	192	1881	100	c	o N	1/5	175	→	NBT	→
													0.0	0.0	0.0	0.0	0.00	1.00	605	0.00	529	1.00	0.0	0.0	1599	0 0	0.00	529	_	0.91	_	0	1881	1 .00	3	_	665	665	-34	NBR	•
												C	34.7	4.6	2.0	32.7	1.00	1.00	384	0.61	326	1.00	13.6	13.6	1198	100	0.20	326	_	0.91	_	198	1881	100	3 0	> -	080	180	J.	SBL	•
									C	34.2	483	C	34.5	6.0	2.8	31.7	1.00	1.00	471	0.68	381		10.9	10.9	1881	250	0.20	381	_	0.91	_	258	1881	1	c	0	235	235	→	SBT	-
												C	27.9	0.0	0.1	27.8	1.00	1.00	400	0.08	324	1.00	1.2	1.2	1599	27	0.20	324	_	0.91	_	27	1881	1.00	3	0 0	25	25	-34	SBR	•

Tumwater Transportation Master Plan SCJ Alliance

HCM 2010 TWSC 28: Trosper Rd & Rural Rd

Projected 2022 without improvements
PM Peak Hour

Intersection Int Delay, s/veh 3.9 Movement Traffic Vol., veh/h Future Vol., veh/h Conflicting Peds, #/hr	EBL 55	EBT 205 205 0	WBT 330 330	WBR 110 110 0	SBL 95 95	SBR 100 100
Grade, % Peak Hour Factor Heavy Vehicles, % Mvmt Flow	92 -	0 92 0 223	0 92 1 359	92 120	0 92 2 103	92 2 109
Major/Minor Conflicting Flow All Stage 1 Stage 2 Critical Holow	Major1 478 -	0	Major2	0	Minor2 760 418 342 643	418
Critical Hdwy Stg 1 Critical Hdwy Stg 2 Follow-up Hdwy Pot Cap-1 Maneuver	2.2				5.42 5.42 3.518 3.74	3.318
Stage 1 Stage 2 Platoon blocked, %					664	5
Mov Cap-1 Maneuver Stage 1 Stage 2					350 350 664 674	
Approach HCM Control Delay, s HCM LOS	1.8		WB 0		SB 15.6 C	Ш
Minor Lane/Major Mymt Capacity (veh/h) HCM Lane V/C Ratio HCM Control Delay (s) HCM Lane LOS HCM Sth %tile Q(veh)	EBL 1095 0.055 8.5 A 0.2	EBT \ A A	WBT WBR SBLn1 SBLn2 - 350 635 - 0.295 0.171 - 19.5 11.8 - C B - 1.2 0.6			Ш

Synchro 9 Report 6/10/2016

Tumwater Transportation Master Plan SCJ Alliance

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

Projected 2022 without improvements

PM Peak Hour

The page of the

Natural Cycle: 60 Control Type: Actuated-Uncoordinated	Actuated Cycle Length: 46	Cycle Length: 60	Area Type:	Intersection Summary	Recall Mode	Lead-Lag Optimize?	Lead/Lag	Total Lost Time (s)	Lost Time Adjust (s)	All-Red Time (s)	Yellow Time (s)	Total Split (%)	Total Split (s)	Minimum Split (s)	Minimum Initial (s)	Switch Phase	Detector Phase	Permitted Phases	Protected Phases	Turn Type	Shared Lane Traffic	Heavy Vehicles (%)	Peak Hour Factor	Travel Time (s)	Link Distance (ft)	Link Speed (mph)	Right Turn on Red	Taper Length (ft)	Storage Lanes	Storage Length (ft)	Ideal Flow (vphpl)	Future Volume (vph)	Traffic Volume (vph)	Lane Configurations	Lane Group	
ited-Uncoord	gth: 46		Other	IIV								==									(%)											_	_	0,		
inated			_		None						3.5						7	4	7	pm+pt		1%	0.95					25	_	125	1900	10	10	_#	EBL	-
					None	Yes	Lag	4.5	0.0	1.0	3.5	45.0%	27.0	26.5	5.0		4		4	NA		1%	0.95	45.7	2012	30					1900	290	290	≱	EBT	ţ
																						1%	0.95				Yes		_	150	1900	45	45		EBR	1
					None	Yes	Lead	4.5	0.0	1.0	3.5	15.8%	9.5	9.5	5.0		ω	œ	ω	pm+pt		1%	0.95					25	_	225	1900	55	55	_#	WBL	4
					None	Yes	Lag	4.5	0.0	1.0	3.5	45.0%	27.0	26.5	5.0		œ		00	NA		1%	0.95	14.8	652	30					1900	415	415	→	WBT	†
					None	Yes	Lag	4.5	0.0	1.0	3.5	45.0%	27.0	26.5	5.0		œ	œ		Perm		1%	0.95				Yes		_	0	1900	75	75	74	WBR	1
					Max			4.5	0.0	1.0	3.5	39.2%	23.5	21.5	5.0		2	2		Perm		0%	0.95					25	_	100	1900	65	65	J,	NBL	۶
					Max			4.5	0.0	1.0	3.5	39.2%	23.5	21.5	5.0		2		2	NA		0%	0.95	6.1	269	30					1900	25	25	¥	NBT	→
																						0%	0.95				Yes		0	0	1900	60	60		NBR	•
					Max			4.5	0.0	1.0	3.5	39.2%	23.5	21.5	5.0		6	6		Perm		0%	0.95					25	_	125	1900	70	70	_#	SBL	•
					Max			4.5	0.0	1.0	3.5	39.2%	23.5	21.5	5.0		6		6	NA		0%	0.95	13.3	583	30					1900	20	20	¥	SBT	←
																						0%	0.95				Yes		0	0	1900	15	15		SBR	•

07

Splits and Phases: 29: Lake Park Dr & Trosper Rd

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27s

Tumwater Transportation Master Plan SCJ Alliance

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

Projected 2022 without improvements

	•	.	/	\	t	*	٠	+	•	•	-	
	1	1	4	4	5		_	<u> </u>	-	1	4	4
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	H	₹		JI.	→	-34	H	₽÷		_#	Ŧ,	
Traffic Volume (veh/h)	10	290	45	55	415	75	65	25	60	70	20	15
Future Volume (veh/h)	10	290	45	55	415	75	65	25	60	70	20	15
Number	7	4	14	ω	00	18	5	2	12	_	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1900	1881	1881	1881	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	=	305	47	58	437	79	68	26	63	74	21	16
Adj No. of Lanes	_	2	0	_	_	_	_	_	0	_	_	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
Cap, veh/h	277	875	133	456	607	516	866	191	463	617	388	296
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), veh/h	11	174	178	58	437	79	89	0	89	74	0	37
Grp Sat Flow(s),veh/h/ln	1792	1787	1797	1792	1881	1599	1393	0	1689	1329	0	1765
Q Serve(g_s), s	0.2	3.8	3.9	<u>-</u>	10.0	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	<u>-</u> 1	10.0	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		0.71	1.00		0.43
Lane Grp Cap(c), veh/h	277	503	506	456	607	516	668	0	655	617	0	684
V/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
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	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 (d2), s/veh	0.1	0.4	0.4	0.1	2./	0.1	0.3	0.0	0.4	0.4	0.0	0.2
initial Q Delay(d3),Sven	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 BackOlQ(50%), ven/in	130	14.7	2.0	11 /	16.2	120.8	10./	0.0	10.8	11.7	0.0	0 .0
InGra I OS	D .	D 1	D .	D :	D .	D .	D :	0.00		i a		> ?
Approach Vol. veh/h	,	363			574	c		157	,	,	111	:
Approach Delay s/yeh		14 4			15.2			10.2			10.7	
Approach LOS		В			В			В			В	
Timer	_	2	ယ	4	ייט	6	7	x				
Assigned Phs		2	ω	4		6	7	∞				
Phs Duration (G+Y+Rc), s		23.5	7.2	18.3		23.5	5.2	20.3				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		19.0	5.0	22.5		19.0	5.0	22.5				
Max Q Clear Time (g_c+l1), s		4.2	<u>3.1</u>	5.9		5.5	2.2	12.0				
Green Ext Time (p_c), s		0.9	0.0	4.8		0.9	0.0	3. 8				
Intersection Summary												
HCM 2010 Ctrl Delay			13.9									
HCM 2010 LOS			В									

Tumwater Transportation Master Plan SCJ Alliance

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

Projected 2022 without improvements
PM Peak Hour

Splits and Phases: 30: Little \[\begin{array}{c c c c c c c c c c c c c c c c c c c	Intersection Summary Area Type: Cycle Length: 135 Actualed Cycle Length: 135 Offset: 46 (34%), Referenced to phase 8:WBTL, Start of Red Natural Cycle: 130 Control Type: Actualed-Coordinated	Recall Mode	Lead/Lag Optimize?	Total Lost Time (s)	Lost Time Adjust (s)	All-Red Time (s)	Yellow Time (s)	Total Split (S)	Minimum Split (s)	Minimum Initial (s)	Switch Phase	Detector Phase	Permitted Phases	Protected Phases	Turn Type	Shared Lane Traffic (%)	Heavy Vehicles (%)	Peak Hour Factor	Travel Time (s)	Link Speed (mph)	Right Turn on Red	Taper Length (ft)	Storage Lanes	Storage Length (ft)	Ideal Flow (vphpl)	Future Volume (vph)	Traffic Volume (vph)	Lane Configurations	Lane Group	
30: Littlerock Rd/2nd Ave & Trosper Rd Ro2 8	Other ed to phase	Max		4.6	0.0	1.0	3.6	36.U 26.7%	35.6	4.0		4		4	Split		1%	0 98				25	_	100	1900	50	50	_#	EBL	\
2nd Ave 8	8:WBTL,	Max		4.6	0.0	1.0	3.6	36.U 26.7%	35.6	4.0		4		4	NA		1%	0 98	14.8	30					1900	315	315	↑	EBT	ţ
र Trosper	Start of F																1%	0.98			Yes	:	0	0	1900	120	120		EBR	4
ω .	ed e	C-Max C-Max		4.6	0.0	1.0	3.6	27.4%	33.6	4.0		00		00	Split	37%	1%	0 98				25	_	150	1900	395	395	J,	WBL	1
68		C-Max		4.6	0.0	1.0	3.6	37.0	33.6	4.0		00		00	NA		1%	0.98	11 8	30	:				1900	325	325	\$ \$	WBT	†
																	1%	0.98			Yes	:	0	0	1900	35	35		WBR	1
		Max	Yes	4.6	0.0	1.0		24.0	24.5	4.0		5		5	Prot		1%	0.98				25	_	250	1900	215	215	Ħ	NBL	۶
			Yes	4.6	0.0	1.0	3.6	31 1%	30.6	4.0		2		2			1%	0.98	20 4	30					1900	265	265	→	NBT	→
₹ Ø8 (R)		C-Max		4.6	0.0	1.0	3.6	37.0	33.6	4.0		00	2	œ	pm+ov		1%	0.98			Yes	:	_	0	1900	440	440	74	NBR	•
		None	Yes	4.6	0.0	1.0	3.6	14.8%	8.6	4.0		_		_	Prot		1%	0.98				25	2	150	1900	115	115	J,	SBL	•
		Max	Yes Lag	4.6	0.0	1.0	3.6	33.U 24.4%	37.6	4.0		6		6	NA		1%	86.0	A2 3	30					1900	300	300	∱	SBT	+
																	1%	0.98			Yes	:	0	250	1900	60	60		SBR	*

Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

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

Projected 2022 without improvements
PM Peak Hour

	-	Ļ	1	1	†	*	۶	→	*	•	←	•
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
ane Configurations	Ħ	→		Ħ	\$÷		H	→	-1	Ħ	÷	
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 0	14	o ω	0 00	18	0 07	2	12	o <u> </u>	6	16
Pad-Bika Adi(A nhT)	3	c	3 0	100	c	100	100	c	100	180	c	3 0
Parking Bus, Adi	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1900	1881	1881	1900	1881	1881	1881	1881	1881	1900
Adj Flow Rate, veh/h	51	321	61	257	536	36	219	270	332	117	306	61
adj No. of Lanes	0 00 -	000	000	000	0000	000	000 -	00 -	000 -	0 00 -	0000	000
Percent Heavy Veh. %	1	1	1	0.90	1	1	0.90	1	0.90	1	0.90	0.90
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	2979	586
Grp Volume(v), veh/h	51	189	193	257	289	283	219	270	332	117	182	185
Grp Sat Flow(s), veh/h/ln	1792	1787	1782	1792	1881	1840	1792	1881	1599	1792	1787	1778
2 Serve(g_s), s	3.O	12.3	12.6	15 3 3 3	16.7	16.8	15.4	15.6	15.8	8.7	12.1	12.4
Prop In Lane	1.00	i	0.32	1.00		0.13	1.00	0	1.00	1.00	i	0.33
_ane Grp Cap(c), veh/h	417	416	414	430	451	442	324	587	883	141	376	374
//C Ratio(X)	0.12	0.46	0.46	0.60	0.64	0.64	0.68	0.46	0.38	0.83	0.48	0.49
AVAII Cap(C_a), ven/n	1 90	100	1 9 4 14	1 67	167	1 67	100	100	100	1 00	100	100
Jpstream Filter(I)	0.97	0.97	0.97	0.83	0.83	0.83	0.87	0.87	0.87	1.00	1.00	1.00
Jniform Delay (d), s/veh	40.9	44.5	44.6	35.3	35.7	35.8	51.6	37.3	17.1	61.3	46.9	47.0
ncr Delay (d2), s/veh	0.6	3.5	3.6	5.0	5.6	5.8	9.5	2.2	<u></u>	16.6	4.4	4.6
nitial 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
nGrn Delav(d) s(veh	41.5	47 9	48.2	40.1	41.4	41 6	61.1	30 .C	18.1	77.8	51.4	516
_nGrp LOS	D	D	D	D	D	D	Е	D	В	П	D	
Approach Vol, veh/h		433			829			821			484	
Approach Delay, s/veh		47.3			41.1			36.6			57.8	
Approach LOS		D			D			D			Е	
Timer	1	2	ယ	4	5	6	7	8				
Assigned Phs	_	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	15.3	46.7		36.0	29.0	33.0		37.0				
Change Period (Y+Rc), s	4.6	4.6		4.6	4.6	4.6		4.6				
Wax Green Setting (Gmax), s	15.4	37.4		31.4	24.4	28.4		32.4				
From Ext Time (n. c) c	0.1	4.0		1.8	0.3	3.6		3.7				
Green Ext Time (p_c), s												
ntersection Summary												
Intersection Summary HCM 2010 Ctrl Delay			43.9									

Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

Lanes, Volumes, Timings
31: Tyee Dr/l-5 SB Ramps & Trosper Rd

Projected 2022 without improvements

PM Peak Hour

	,	Ļ	1	1	Ť	>	۶	→	*	•	-	4
ane Group	FB	FBT	FBR	WBI	WRT	WBR	NB -	NBT .	NBR	SB	SBT	SBR
Lane Configurations	×	>	-34	H	}		Ħ	>	-1	J J	→	-1
Traffic Volume (vph)	170	640	20	265	340	240	25	190	345	430	330	415
Future Volume (vph)	170	640	20	265	340	240	25	190	345	430	330	415
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		100	275		0	75		125	400		400
Storage Lanes	_		_	_		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)		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	pt+ov	Split	NA	Perm
Protected Phases	7	4		ω	00		2	2	23	6	6	
Permitted Phases			4									6
Detector Phase	7	4	4	ω	00		2	2	23	6	6	6
Switch Phase	•	100	100	2	100		5	5		5	5	
Minimum Split (s)	8.6	336	33.6	20.4	29.6		20.5	20.5		24.6	36.6	24.5
Total Split (s)	25.5	38.0	38.0	32.0	44.5		24.0	24.0		41.0	41.0	41.0
Total Split (%)	18.9%	28.1%	28.1%	23.7%	33.0%			17.8%		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
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	Lag	Lead	Lag							
Recall Mode	None	C-Max	C-Max	None	C-Max		Max	Max		Max	Max	Max
Intersection Summary												
Area Type:	Other											
Cycle Length: 135												
Actuated Cycle Length: 135	35	1			-							
Olisel: 46 (34%), Referenced to phase 4:EBT and 8:WBT, Start of Red Natural Cycle: 110	ced to phase	4:EBI a	10 8:WB1	, Start of	Red							
Control Type: Actuated-Coordinated	oordinated											
Splits and Phases: 31:	Tyee Dr/l-5 SB Ramps & Trosper Rd	B Ramps	s & Trosp	er Rd								
4	g K				\$			ı	1774 (0)			
4	41 s				32 s			38 s	2			
					,			1				
					25.5 s		4	44.5 s	Ì			

Tumwater Transportation Master Plan SCJ Alliance

HCM 2010 Signalized Intersection Summary 31: Tyee Dr/l-5 SB Ramps & Trosper Rd

Projected 2022 without improvements
PM Peak Hour

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Movement	B	EBT	EBR •	WBL •	WBT	WBR	NB .	NBT -	NBR -	SBL	SBT	SBR
Lane Configurations	æ	\$	-34	J,	}		n	•	-34	4	•	-34
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	ω	00	18	5	2	12	_	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1881	1881	1881	1900	1863	1863	1863	1881	1881	1881
Adj Flow Rate, veh/h	179	674	21	279	358	0	26	200	310	453	347	121
Adj No. of Lanes	_	2	_	_	2	0	_	_	_	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, %	_	_	_	_	_	_	2	2	2	_	_	_
Cap, veh/h	202	1006	450	303	1206	0	255	268	495	628	507	431
Arrive On Green	0.23	0.56	0.56	0.28	0.56	0.00	0.14	0.14	0.14	0.2/	0.27	0.27
Sat Flow, veh/h	1792	3574	1599	1792	3668	0	1774	1863	1583	2329	1881	1599
Grp Volume(v), veh/h	179	674	21	279	358	0	26	200	310	453	347	121
Grp Sat Flow(s), veh/h/ln	1792	1787	1599	1792	1787	0	1774	1863	1583	1165	1881	1599
U Serve(g_s), s	13.0	17.9	0.8	20.4	7.7	0.0	1.7	13.9	19.4	23.8	22.3	, <u>~</u>
Cycle U Clear(g_c), s	13.0	17.9	0.8	20.4	7.7	0.0		13.9	19.4	23.8	22.3	2 2
Prop In Lane	30.0	1006	1.00	303	1204	0.00	355	240	1.00	.00	E07	200
V/C Ratin(X)	0 88 0	0.67	0.05	0 00	0.30	000	010	0 75	0.63	0.70	0.68	0 78
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	2.00	1.67	1.67	1.67	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	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 (d2), 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(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	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	т	C	С	Е	C		D	Е	D	D	D	D
Approach Vol, veh/h		874			637			536			921	
Approach Delay, s/veh		36.5			42.9			55.9			50.2	
Approach LOS		D			D			П			D	
Timer		2	ω	4	51	6	7	∞				
Assigned Phs		2	ω	4		6	7	∞				
Phs Duration (G+Y+Rc), s		24.0	27.4	42.6		41.0	19.9	50.1				
Change Period (Y+Rc), s		4.6	4.6	4.6		4.6	4.6	4.6				
Max Green Setting (Gmax), s		19.4	27.4	33.4		36.4	20.9	39.9				
Max Q Clear Time (g_c+l1), s		21.4	22.4	19.9		25.8	15.0	9.1				
Green Ext Time (p_c), s		0.0	0.4	5.6		3.9	0.2	7.8				
Intersection Summary												
HCM 2010 Ctrl Delay			45.6									
HCM 2010 LOS			D									

Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

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

Projected 2022 without improvements
PM Peak Hour

	W	Ļ	1	^	Ť	۲	۶	#	*	6	/
Lane Group	BE	EBT	EBR	WBL	WBT	WBR	NBL2	NBL	NBR	SEL	SER
Lane Configurations		↑			}		ı		74		
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)	300		0	0		0		0	200	0	0
Storage Lanes	_		0	0		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%	1%	0%	0%
Shared Lane Traffic (%)											
Turn Type		NA			NA		Prot		Prot		
Protected Phases		4			00		5		5		
Permitted Phases											
Detector Phase		4			00		5		5		
Switch Phase											
Minimum Initial (s)		10.0			10.0		6.0		6.0		
Minimum Split (s)		21.5			21.5		10.6		10.6		
Total Split (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											
Lead-Lag Optimize?											
Recall Mode		C-Max			C-Max		None		None		
Intersection Summary											
Area Type: Other	1er										
th: 135											
Actuated Cycle Length: 135	5	A.EDT a	nd 0.11/D	T Ctart of	D						
Natural Cycle: 40	011000	-	0.440	, orair of	, co						
Control Type: Actuated-Coordinated	nated										
:											
Splits and Phases: 32: I-5 NB Ramps & Trosper Rd	3 Ramps	& Trospe	er Rd								
		↓ 64 (R)	B								
			(1)								

Tumwater Transportation Master Plan SCJ Alliance

↑ Ø8 (R)

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

Projected 2022 without improvements
PM Peak Hour

	W	ţ	1	1	†	ř	۶	_#	•	4	~
Novement	EBL	EBT	EBR	WBL	WBT	WBR	NBL2	NBL	NBR	SEL	SER
ane Configurations		≯ ₽			₩		JI.		-34		
Traffic Volume (veh/h)	0	905	545	0	660	615	190	0	85	0	0
-uture Volume (ven/h)	1 0	405	545	· c	660	615	061	1 0	3 85	c	C
Vumber	7	4	14	ω	8	18	5	5	12		
nitial Q (Qb), veh	8 0	0	0	0	0	0	0	0	0		
Pea-Bike Adj(A_pb1)	3.0	3	3	1.00	3	1.00	1.00	3.0	1.00		
Parking Bus, Auj Adi Sat Flow, veh/h/In	0 0	1881	1900	0	1881	1900	1881	1881	1881		
Adj Flow Rate, veh/h	0	973	0	0	710	0	204	204	0		
\dj No. of Lanes	0	ω	0	0	2	0	_	_	_		
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	_	_	0	_	_	_	_	_		
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/h/ln	0	1712	0	0	1787	0	1792	1792	1599		
Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	5.1	15.1	0.0		
cycle d clear(g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	1 5.	3	0.0		
ane Gro Cap(c), veh/h	0	4125	0.00	0.00	2871	0.00	230	230	206		
//C Ratio(X)	0.00	0.24	0.00	0.00	0.25	0.00	0.89	0.89	0.00		
\vail Cap(c_a), veh/h	0	4125	0	0	2871	0	457	457	407		
ICM Platoon Ratio	1.00	2.00	2.00	1.00	2.00	2.00	1.00	1.00	1.00		
Jpstream Filter(I)	0.00	0.66	0.00	0.00	0.49	0.00	1.00	1.00	0.00		
Jniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	57.8	57.8	0.0		
ncr Delay (d2), s/veh	0.0	0.1	0.0	0.0	0.1	0.0	4.5	4.5	0.0		
nitial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	7.8	7.8	0.0		
.nGrp Delay(d),s/veh	0.0	0.1	0.0	0.0	0.1	0.0	62.3	62.3	0.0		
TIGIP LOS		O A			710 A		3 1	2 1			
Approach Delay s/yeh		01			01		62 3	623			
Approach LOS		Þ			Þ		т	ш			
Timer		2	ω	4	5	6	7	œ			
\ssigned Phs		2		4				8			
Phs Duration (G+Y+Rc), s		22.0		113.0				113.0			
Change Period (Y+Rc), s		4.6		4.6				4.6			
Max Green Setting (Gmax), s		34.4		91.4				91.4			
Vlax Q Clear Time (g_c+l1), s		17.1		2.0				2.0			
Green Ext Time (p_c), s		0.3		15.7				15.7			
ntersection Summary											
HCM 2010 Ctrl Delay			6.8								

Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

Lanes, Volumes, Timings
33: Capitol Blvd & Trosper Rd

S 7.TC	2 Ø2 (R)	Splits and Phases:	Control Type: Actuated-Coordinated	Natural Cycle: 145	Offset: 6 (4%), Referenced to phase 2:NBTL, Start of Red	Actuated Cycle Length: 135	Cycle Length: 135	Area Type:	Intersection Summary	Recall Mode	Lead-Lag Optimize?	Lead/Lag	Total Lost Time (s)	Lost Time Adjust (s)	All-Red Time (s)	Yellow Time (s)	Total Split (%)	Total Split (s)	Minimum Split (s)	Minimum Initial (s)	Switch Phase	Detector Phase	Permitted Phases	Protected Phases	Turn Type	Shared Lane Traffic (%)	Heavy Vehicles (%)	Peak Hour Factor	Travel Time (s)	Link Distance (ft)	Link Speed (mph)	Right Turn on Red	Taper Length (ft)	Storage Lanes	Storage Length (ft)	Ideal Flow (vphpl)	Future Volume (vph)	Traffic Volume (vph)	Lane Configurations	Lane Group	
			e: Actuated	e: 145	6), Referen	cle Length	h: 135		Summary	1,5	ptimize?		ime (s)	djust (s)	(S)	(s)	<u>~</u>	٣	ilit (s)	tial (s)	Ö	ase	nases	nases		e Traffic (%	des (%)	actor	(s)	e (ft)	(mph)	n Red	h (ft)	es	gth (ft)	/phpl)	ne (vph)	ne (vph)	urations		
		33: Capitol Blvd & Trosper Rd	-Coordinat		ced to pha	: 135		Other		Z							15.	2	2	_						_		0								10		, ,			,
		Blvd &	ed		se 2:N					None			4.6	0.0	1.0	3.6	15.3%	20.6	20.6	10.0		4		4	Split	43%	1%	0.99					25	_	0	1900	325	325	Ħ	EBL	*
		Trosper			JBTL, St					None			4.6	0.0	1.0	3.6	15.3%	20.6	20.6	10.0		4		4	NA		1%	0.99	9.0	397	30					1900	50	50	2	EBT	ţ
27.0	4	Rd			art of Re					C-Min			4.6	0.0	1.0	3.6	37.9%	51.2	29.6	6.0		2	4	2	vo+md		1%	0.99				Yes		_	0	1900	600	600	74	EBR	4
ů.	Ø6				ū					None			4.6	0.0	1.0	3.6	21.2%	28.6	28.6	6.0		00		<u>∞</u>	Split		0%	0.99					25	_	50	1900	30	30.	J,	WBL	4
										None			4.6	0.0	1.0	3.6	21.2%	28.6	28.6	6.0		00		8	NA		0%	0.99	7.7	338	30					1900	75	75	₽÷	WBT	†
																											0%	0.99				Yes		0	0	1900	섫	35		WBR	~
20.0	\$									C-Min			4.6	0.0	1.0	3.6	37.9%	51.2	29.6	6.0		2		2	Split	39%	1%	0.99					25	_	250	1900	795	795	Ħ	NBL	۶
	04									C-Min			4.6	0.0	1.0	3.6	37.9%	51.2	29.6	6.0		2		2	NA		1%	0.99	16.7	735	30					1900	675	675	♣	NBT	→
20																											1%	0.99				Yes		0	0	1900	10	10		NBR	•
20.05	80									None			4.6	0.0	1.0	3.6	25.6%	34.6	34.6	6.0		6		6	Split		1%	0.99					25	_	100	1900	15	15.	s	SBL	•
										None			4.6	0.0	1.0	3.6	25.6%	34.6	34.6	6.0		6		6	NA		1%	0.99	60.5	2664	30					1900	615	615	*	SBT	—
										None			4.6	0.0	1.0	3.6	25.6%	34.6	34.6	6.0		6	6		Perm		1%	0.99				Yes		_	200	1900	395	395	٦,	SBR	4

Tumwater Transportation Master Plan SCJ Alliance

HCM 2010 Signalized Intersection Summary 33: Capitol Blvd & Trosper Rd

Projected 2022 without improvements

	١		4	4			-					
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	.	2	- 4	J	₩	2	#	‡ ¥		.	\$	
Traffic Volume (veh/h)	325	50	600	30	75	2 W	795	675	10	1 5	615	395
Number	325	20	14	ى د	o 0	35	n 0'9'5	2/0	3 5	7 0	010	345
Number	> ~	4 C	0 4	ے د د	ο α	> a	o 0	0 ~	0 2	o –	o •	o o
Ped-Bike Adi(A pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1881	1900	1900	1900	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	_	_	_	0	_	2	0	_	2	_
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, %	- i	o <u>-</u>	247	200	2 0	20	26 -	17/1	1 _	3 -	20	2
Cap, ven/n	425	800	004/	139	0 95	0 00	849	1/64	070	349	046	3
Sat Flow web/h	3583	0.00	1500	1810	1222	568	1702	3773	2/	1702	35.74	1500
Grn Volume(v) web/b	364		270	30	0	111	409	540	550	15	631	
Grp Sat Flow(s), veh/h/ln	1792	0 0	1599	1810	0 0	1800	1792	1 881	1875	1792	1787	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	•	0.32	1.00		0.02	1.00		1.00
V/C. Ratio(X)	0 86	000	0 40	0 22	000	0.80	0.59	0 63	0 63	0 04	089	000
Avail Cap(c_a), veh/h	425	0	947	322	0	320	849	891	888	398	794	355
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.67	1.67	1.67	1.00	1.00	1.00
Upstream Filter(I)	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
Incrueiay (az), siven	14.2	0.0	0	0.3	0.0	4.0	2.4	2.7	2.7	0.0	0.0	0.0
%ile BackOfQ(50%).veh/ln	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	ш		В	Е		т	В	В	В	D	ш	
Approach Vol, veh/h		743			141			1617			636	
Approach Delay, s/veh		46.2			63.9			717.7			55.5	
Approach LOS		D			ш			В			ш	
Timer	_	2	ω	4	5	6	7	œ				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		68.5		20.6		30.9		15.0				
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 (g_c+l1), s		18.7		17.4		24.9		10.2				
Green Ext Time (p_c), s		6.4		0.0		1.4		0.2				
Intersection Summary												
HCM 2010 Ctrl Delay			31.1									
HCM 2010 LOS)									

Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

Lanes, Volumes, Timings 34: Capitol Blvd & Lee St

Projected 2022 without improvements

PM Peak Hour

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Tumwater Transportation Master Plan SCJ Alliance

HCM Signalized Intersection Capacity Analysis 34: Capitol Blvd & Lee St

Projected 2022 without improvements
PM Peak Hour

Analysis Period (min) c Critical Lane Group	Intersection Capacity Utilization	Actuated Cycle Length (s)	HCM 2000 Volume to Capacity ratio	HCM 2000 Control Delay	Intersection Summary	Approach LOS	Approach Delay (s)	Level of Service	Delay (s)	Incremental Delay, d2	Progression Factor	Uniform Delay, d1	v/c Ratio	v/s Ratio Perm	v/s Ratio Prot	Lane Grp Cap (vph)	Vehicle Extension (s)	Clearance Time (s)	Actuated g/C Ratio	Effective Green, g (s)	Actuated Green, G (s)	Permitted Phases	Protected Phases	Turn Type	Heavy Vehicles (%)	Lane Group Flow (vph)	RTOR Reduction (vph)	Adi. Flow (vph)	Peak-hour factor DHF	Fit Permitted	Satd. Flow (prot)	Flt Protected	Frt	Lane Util. Factor	Total Lost time (s)	Ideal Flow (vphpl)	Future Volume (vph)	Traffic Volume (vph)	Lane Configurations	Movement	
	ion		ity ratio																			4		Perm	1%	0	0	323	0 03							1900	300	300		EBL	\
						П	62.2	Е	66.2	19.8	1.00	46.4	0.88	c0.25		373	2.0	4.6	0.28	37.8	37.8		4	NA	1%	328	0	ъ ў	002	0.71	1793	0.95	1.00	1.00	4.6	1900	57	5	2,	EBT	ţ
15	71.9%	135.0	0.69	26.4				D	35.3	0.0	1.00	35.3	0.03	0.01		447	2.0	4.6	0.28	37.8	37.8	4		Perm	1%	13	S :	48	003	1.00	1599	1.00	0.85	1.00	4.6	1900	45	45	74	EBR	1
	_	S		Ŧ																		00		Perm	0%	0	0	16	0.03							1900	15	15		WBL	4
	ICU Level of Service	Sum of lost time (s)		CM 2000		D	35.6	D	35.7	0.0	1.00	35.7	0.07	0.02		408	2.0	4.6	0.28	37.8	37.8		œ	NA	0%	27	0	11	003	0.77	1845	0.97	1.00	1.00	4.6	1900	10	10	Ž,	WBT	†
	of Service	time (s)		HCM 2000 Level of Service				D	35.5	0.0	1.00	35.5	0.05	0.01		452	2.0	4.6	0.28	37.8	37.8	00		Perm	0%	24	62	86	003	1.00	1615	1.00	0.85	1.00	4.6	1900	80	80	74	WBR	/
				service				т	67.1	2.6	1.00	64.4	0.50		0.02	54	1.5	4.6	0.03	4.1	4.1		5	Prot	1%	27	0	27	003	0.95	1787	0.95	1.00	1.00	4.6	1900	25	25	_#	NBL	۶
						С	21.9	C	20.9	1.4	1.00	19.5	0.61		c0.34	2010	3.0	4.6	0.56	76.2	76.2		2	NA	1%	1220		1194	002	1.00	3562	1.00	1.00	0.95	4.6	1900	1110	1110	÷	NBT	→
	C	13.8		С																					1%	0	0 !	27	003							1900	25	25		NBR	•
								ш	56.4	6.7	0.79	62.6	0.62		c0.03	95	1.6	4.6	0.05	7.2	7.2		_	Prot	1%	59	0	59	003	0.95	1787	0.95	1.00	1.00	4.6	1900	55	55	_#	SBL	•
						В	19.5	В	17.7	0.9	0.96	17.5	0.59		c0.34	2047	3.0	4.6	0.59	79.3	79.3		6	NA	1%	1200	10	1011	0400	1.00	3486	1.00	0.98	0.95	4.6	1900	940	940	÷	SBT	←
																									1%	0	0	199	003							1900	185	185		SBR	•

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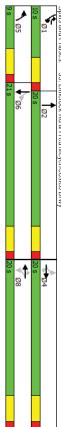
Lanes, Volumes, Timings
35: Littlerock Rd & Fred Meyer/Costco Drwy

Projected 2022 without improvements

PM Peak Hour

Natural Cycle: 50 Control Type: Actuated-Uncoordinated	Actuated Cycle Length: 42.1	Cycle Length: 50	Area Type:	Intersection Summary	Recall Mode	Lead-Lag Optimize?	Lead/Lag	Total Lost Time (s)	Lost Time Adjust (s)	All-Red Time (s)	Yellow Time (s)	Total Split (%)	Total Split (s)	Minimum Split (s)	Minimum Initial (s)	Switch Phase	Detector Phase	Permitted Phases	Protected Phases	Turn Type	Shared Lane Traffic (%	Heavy Vehides (%)	Peak Hour Factor	Travel Time (s)	Link Distance (ft)	Link Speed (mph)	Right Turn on Red	Taper Length (ft)	Storage Lanes	Storage Length (ft)	Ideal Flow (vphpl)	Future Volume (vph)	Traffic Volume (vph)	Lane Configurations	Lane Group	
ited-Unco	gth: 42.1		0	iīy		~			_												(%)											_	_	0,		
ordinated			Other		None					1.0	3.0	40.0%	20.0	20.0	5.0		4	4				0%	0.95					25	0	0	1900	0	0		EBL	-
					None			4.0	0.0	1.0	3.0	40.0%	20.0	20.0	5.0		4		4			0%	0.95	8.9	390	30					1900	0	0	2 ,	EBT	Į.
					None			4.0	0.0	1.0	3.0	40.0%	20.0	20.0	5.0		4	4		Perm		0%	0.95				Yes		_	0	1900	0	0	-4	EBR	1
					None					1.0	3.0	40.0%	20.0	20.0	5.0		00	00		Perm		1%	0.95					25	0	0	1900	130	130		WBL	4
					None			4.0	0.0	1.0	3.0	40.0%	20.0	20.0	5.0		00		00			1%	0.95	9.7	426	30					1900	5	5	2 ,	WBT	†
					None	Yes	Lead	4.0	0.0	1.0	3.0	20.0%	10.0	9.0	5.0		_	00	_	pm+ov		1%	0.95				Yes		_	0	1900	115	115	-4	WBR	1
					None	Yes					3.0			9.0			5		5	Prot		1%	0.95					25	_	100	1900	0	0	J,	NBL	۶
					Max	Yes	Lag	4.0	0.0	1.0	3.0	40.0%	20.0	20.0	5.0		2		2	NA		1%	0.95	16.2	713	30					1900	770	770	≯	NBT	-
																						1%	0.95				Yes		0	0	1900	100	100		NBR	•
					None	Yes		4.0					10.0	9.0	5.0		_	6	_	pm+pt		1%	0.95					25	_	175	1900	105	105	JI.	SBL	•
					Max	Yes	Lag	4.0	0.0	1.0	3.0	42.0%	21.0	20.0	5.0		6		6	NA		1%	0.95	20.4	896	30					1900	680	680	ᢌ	SBT	←
																						1%	0.95				Yes		0	0	1900	0	0		SBR	•

35: Littlerock Rd & Fred Meyer/Costco Drwy



Tumwater Transportation Master Plan SCJ Alliance

HCM 2010 Signalized Intersection Summary 35: Littlerock Rd & Fred Meyer/Costco Drwy

Projected 2022 without improvements

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	\	ţ	4	4	1	1	J	_	•	*	+	4
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		Ž,	-14		2,	-4	_#	→		JI.	⇒	
Traffic Volume (veh/h)	0	0	0	130	5	115	0	770	100	105	680	0
Future Volume (veh/h)	0	0	0	130	5	115	0	770	100	105	680	0
Number	7	4	14	ω	00	18	5	2	12	_	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1881	1881	1881	1881	1900	1881	1881	1900
Adj Flow Rate, veh/h	0	0	0	137	5	121	0	811	105	111	716	0
Adj No. of Lanes	0	_	_	0	_	_	_	2	0	_	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	_	_	_	_	_	_	_	_	_
Cap, veh/h	0	285	243	400	00	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	
Grp Volume(v), veh/h	0	0	0	142	0	121	0	455	461	111	716	0
Grp Sat Flow(s), veh/h/ln	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 U Clear(g_c), s	0.0	0.0	0.0	3.4	0.0	2.3	0.0	1.2	7.2	0.1	3.4	0.0
Prop In Lane	0.00	305		0.96	>	307	1.00	77/	702	1.00	2762	0.00
V/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(I)	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	<u>ω</u>	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.2	0.0	0.2	0.0	ωω	3.2	0.2	0.4	0.0
Initial Q Delay(d3), siveh	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 BackUtU(50%),ven/in	0.0	0.0	0.0	15.0	0.0	11.0	0.0	11.7	11 2	0.5	» —	0.0
InGral OS	0	0	9	ъ.	0.0	æ :	0			Α	Α	91
Approach Vol. veh/h		0			263			916			827	
Approach Delay, s/veh		0.0			13.5			11.2			3.7	
Approach LOS					В			В			A	
Timer		2	ယ	4	5	6	7	00				
Assigned Phs	_	2		4	5	6		∞				
Phs 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 (g_c+l1), s	3.0	9.2		0.0	0.0	5.4		5.4				
Green Ext Time (p_c), s	0.0	4.6		0.0	0.0	6.8		0.5				
Intersection Summary												
HCM 2010 Ctrl Delay			8.4									
HCM 2010 LOS			Α									

Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

Tumwater Transportation Master Plan SCJ Alliance

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

Projected 2022 without improvements

PM Peak Hour

Area Type: Other Cycle Length: 75 Actuated Cycle Length: 69.7	IVICA	Secal Mode Max Max	vad-Lag Ontimize?			t (s)	1.0	Yellow Time (s) 3.0 3.0	40.0%	30.0	30.0	ll (s) 5.0	witch Phase	6	6	hases	Perm	: (%)	6)	or 0.95		Link Distance (ft) 32		d	Ξ)	storage Lanes 0	0	1900	80		ane Configurations	ane Group SEL SE	¥
		v Max						0 3.0						6 6			A Perm					5		Yes					5 15		7	T SER	۳
	MICIA	Max						3.0						2	2		Perm		0%	0.95					25	0	0	1900	130	130		NWL	7
	MICA	Max			4.0	0.0	1.0	3.0	40.0%	30.0	30.0	5.0		2		2	NA		0%	0.95	13.8	809	30					1900	5	57	2,	TWN	×
	MICIA	Max			4.0	0.0	1.0	3.0	40.0%	30.0	30.0	5.0		2	2		Perm		0%	0.95				Yes		_	100	1900	220	220	74	NWR	~
								3.0		10.5		5.0		7		7	Prot		1%	0.95					25	_	150	1900	50	50	Ħ	NEL	अ
	VOIC	None	Yes	Lag	4.0	0.0	1.0	3.0	40.0%	30.0	30.0	5.0		4		4	NA		1%	0.95	22.6	995	30					1900	590	590	*	NET	×
																			1%	0.95				Yes		0	0	1900	110	110		NER	١
		None	Υρς	Lead	4.0	0.0	1.0	3.0	20.0%	15.0	9.5	5.0		ω		ω	Prot		1%	0.95					25	_	150	1900	220	220	H	SWL	~
	1017	None	Y _{PS}	Lac	4.0	0.0	1.0	3.0	46.0%	34.5	30.0	5.0		00		00	NA		1%	0.95	16.2	713	30					1900	495	495	↑	SWT	×
																			1%	0.95				Yes		0	0	1900	80	80		SWR	*

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Splits and Phases: 36: Littlerock Rd & Costco Drwy

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

Projected 2022 without improvements

PM Peak Hour

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Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		ž,	-1		Ž,	٦,	JI.	≯		JI.	≯	
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	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	0.98		1.00	0.98	
Flt Protected		0.96	1.00		0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1830	1615		1813	1615	1787	3490		1787	3500	
Flt Permitted		0.73	1.00		0.67	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1395	1615		1275	1615	1787	3490		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	0	147	0	21	0	0	17	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	
Protected Phases		6		>	2	>	/	4		cu	00	
Actuated Green, G (s)	c	26.1	26.1	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	0.01		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		В	В		В	В	D	С		D	В	
Approach Delay (s)		16.3			16.5			24.0			24.6	
Approach LOS		В			В			С			С	
Intersection Summary												
HCM 2000 Control Delay			22.4	Ŧ	CM 2000	HCM 2000 Level of Service	Service		С			
HCM 2000 Volume to Capacity ratio	ty ratio		0.54									
Actuated Cycle Length (s)			71.3	Su	Sum of lost time (s)	time (s)			12.0			
Intersection Capacity Utilization	n		56.1%	c	ICU Level of Service	of Service			В			
Analysis Period (min)			15									
c Critical Lane Group												

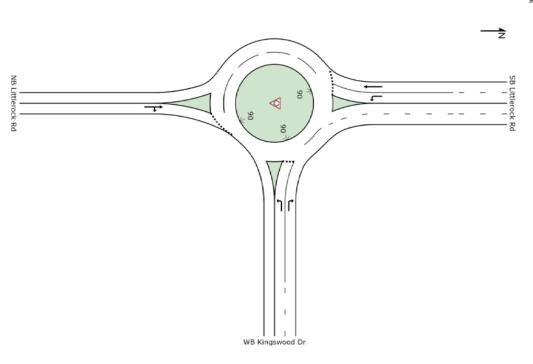
Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/8/2016

SITE LAYOUT

Site: 37) Littlerock Rd at Kingswood Dr

Projected 2022 without improvements
PM Peak Hour
Roundabout



♥ Site: 37) Littlerock Rd at Kingswood Dr

Projected 2022 without improvements PM Peak Hour Roundabout

Movem	Movement Performance - Vehicles	ınce - Veh	icles								
Mov	OD	Demand Flows	-lows	Deg.	Average	Level of	95% Back of Queue	Queue	Prop.	Effective	Average
₽				Sath	Delay				Queued		Speed
										per veh	
South: N	South: NB Littlerock Rd										
00	T1	656	1.0	0.747	5.2	LOSA	9.0	226.0	0.54	0.47	36.0
18	R2	151	1.0	0.747	5.1	LOSA	9.0	226.0	0.54	0.47	35.0
Approach	ד	806	1.0	0.747	5.2	LOSA	9.0	226.0	0.54	0.47	35.8
East: WE	East: WB Kingswood Dr	7									
_	L2	215	1.0	0.254	13.3	LOS B	1.7	43.9	0.76	0.81	33.0
16	R2	91	1.0	0.055	4.2	LOSA	0.0	0.0	0.00	0.49	36.5
Approach	ד	306	1.0	0.254	10.6	LOSB	1.7	43.9	0.53	0.71	33.9
North: SI	North: SB Littlerock Rd										
7	L2	70	1.0	0.092	11.5	LOS B	0.5	12.2	0.47	0.66	33.8
4	7	667	1.0	0.547	5.5	LOSA	4.9	123.5	0.63	0.55	35.7
Approach	h	737	1.0	0.547	6.1	LOSA	4.9	123.5	0.61	0.56	35.5
All Vehicles	les	1849	1.0	0.747	6.4	LOSA	9.0	226.0	0.57	0.55	35.3
l evel of S	Level of Service (LOS) Method: Delay & v/c (HOM 2010)	Nethod: De	lav & v/c	(HCM 2010)							

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

Roundabout LOS Method: Same as Signalised Intersections.

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 M3D).

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

SIDPA,NITRESECTION 6.1 | Copyright © 2007-2015 Ascells and Associates Pty Ltd | sidrasolutions.com Organisation: 6.0 JALLANCE | Processed: Weetesday, June 8, 2016 93703.0 Han/Traffic/Operations/sidra/2022 Baseline/Existing 2022 PM.sp6 Project: NVProjects/0625 City of Turnwater/0625;17 Turnwater/Transportation/Master-Plan/Traffic/Operations/sidra/2022 Baseline/Existing 2022 PM.sp6

Lanes, Volumes, Timings 38: Capitol Blvd & X St

Projected 2022 without improvements PM Peak Hour

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Lane Group	# EBL	₽BT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	
Traffic Volume (vph)	25	1	15	-	- → 3	20	20	975	15	35 _	840	
Future Volume (vph)	25	_	15	15	_	20	20	975	15	35	840	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	100		0	100		0	150		0	250		
Storage Lanes	_		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)		642			1326			1300			1368	
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	
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	1%	1%	1%	1%	1%	
Shared Lane Traffic (%)												
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			00		5	2		_	6	
Permitted Phases	4			00			2			6		
Detector Phase	4	4		8	00		5	2		_	6	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0		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	
Total Split (s)	31.5	31.5		31.5	31.5		9.6	29.9		8.6	28.9	
Total Split (%)	45.0%	45.0%		45.0%	45.0%		13.7%	42.7%		12.3%	41.3%	
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 Optimize?							Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Max		None	Max	
Intersection Summary												
Area Type:	Other											
Cycle Length: 70												
Actuated Cycle Length: 46.3	ω											
Natural Cycle: 70												
Control Type: Actuated-Uncoordinated	oordinated											

Splits and Phases: 38: Capitol Blvd & X St

.6s	<u></u> ✓ Ø5	1.6s 2	\ 01	onto ana masos.
28,9 s	₩26	29.9 s	↑ Ø2	pino dila i nacco. Col capito pina di A Ci
31.5 s	₹ Ø8	31.5 s		

SCJ Alliance Tumwater Transportation Master Plan

HCM 2010 Signalized Intersection Summary 38: Capitol Blvd & X St

Projected 2022 without improvements PM Peak Hour

	•	.	/	\	t	*	٠	*	•	~	-	L
Movement	EB.	E	FRR 4	WRI	WRT	WRR	NR -	NRT -	NRR ~	£,	SRT	SRR
Lane Configurations	H	₽		H	₹		H	≯		H	}	
Traffic Volume (veh/h)	25.		15	15.		20	20	975	15	ж.	840	40
Future Volume (veh/h)	25	_	15	15	_	20	20	975	15	35	840	40
Number	7	4	14	ω	00	18	5	2	12	_	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1881	1881	1900	1881	1881	1900
Adj Flow Rate, veh/h	28	_	17	17	_	22	22	10%	17	39	944	45
Adj No. of Lanes	_	_	0	_	_	0	_	2	0	_	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	_	_	_	_	_	_
Cap, veh/h	269		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
	28	0	18	17	0	23	22	544	569	39	486	503
,veh/h/ln	1410	0	1629	1417	0	1626	1792	1787	1871	1792	1787	1852
Q Serve(g_s), s	0.8	0.0	0.5	0.5	0.0	0.6	0.2	ω ω	ω ω	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	83	80	0.4	6.9	6.9
Prop In Lane	7.00	>	0.94	1.00	>	0.96	1.00	100/	0.03	1.00	1047	0.09
VIC Patio(X)	0 10	000	0 13	006	000	0 14	005	0 53	0.52	000	04/	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(I)	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
InGrn Delay(d) s(yeh	10.5	0.0	100	10.2	0.0	10.3	٥	7 8 7	7.7	4.0.2	6.7	5.0
LnGrp LOS	В		В	В		В	Νİ	Þ	Þ	Þ	D :	Þ
Approach Vol, veh/h		46			40			1135			1028	
Approach Delay, s/veh		19.3			19.2			7.7			6.6	
Approach LOS		В			В			A			Þ	
Timer	_	2	ω	4	5	6	7	00				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.0	29.9		8.4	5.4	30.5		8.4				
Change Period (Y+Rc), 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_c+l1), s	2.4	10.3		3.4	2.2	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 Ctrl Delay			7.6									
HCM Z010 LOS			A									

Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

> HCM 2010 TWSC 39: Elm St & X St

Projected 2022 without improvements
PM Peak Hour

ye 2 101 100	Intersection Int Delay, siveh Movement Traffic Vol. veh/h Conflicting Peds, #/hr Sign Control RT Channelized Storage Length Veh in Median Storage, # Peak Hour Factor Heavy Vehides, % Month Ino Major/Minor Conflicting Flow All Stage 1	3 EBL 5 5 5 5 7 7 7 Minor2	EBT 10 10 10 10 10 10 10 10 10 10 10 10 10	EBR 10 10 10 10 10 10 10 10 10 10 10 10 10		WBL 5 5 5 5 70 0 0 7 74 175 97 97			WBT 5 5 5 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		WBT WBR NB 5 2 5 2 6 0 0 7 None - Non	WBT WBR 5 2 5 2 0 0 0 Slop Slop Slop - None - None - 0 - 0 7 3 165 91 M	WBT WBR NBL NBT NB 5 2 2 65 5 2 2 65 5 2 2 65 0 0 0 0 0 Slop Slop Free Free Free - None - None - None 0 0 74 74 74 74 74 74 70 0 0 0 7 3 3 88 Majort 165 91 68 0	WBT WBR NBL NBT NBR SE 5 2 2 65 5 5 2 2 65 5 5 2 2 65 5 5 2 2 65 5 None - None - None - None - None - None - None - None - None - None - None - None - None - None - None - None - None - None - None - None - None - None - None - None - None - None - None - None - None - None - None - None - None - None - None - None - None - None - N
6.5 6.2 7.1 5.5 6.1 5.5 . 6.1 5.5 . 6.1 5.5 . 6.1 5.5 . 6.1 7.2 8.4 3.3 7.2 1006 792 8.4 974 8.16 . 938 7.31 1006 769 7.31 0. 769 8.4 972 8.4 972 8.4 972 8.4 972 8.4 972 8.4 973 A B B B B B B B B B B B B B B B B B B		Minor2 165 64 101	164 64			Minor1 175 97 78		, % 9 %			91 Maj	91 Major1 68	91 Major1 68	Major1 M 91 68 0 0
5.5 . 6.1 4 3.3 . 3.5 7.2 1006 . 792 846 . 914 816 . 936 731 1006 . 769 731 . 769 846 . 912 814 . 909 814 . 909 NBT NBREBLITWBLIT 0 . 9.5 9.7 A . 9.5 9.7 A A A A		7.1 6.1	6.5 5.5		. 10 .	78 7.1 6.1	6.5	01 01 0	6	6.2	4	4	4.1 .	4.1 - 4.1
804 732 1006 792 804 732 1006 792 952 846 - 914 910 816 - 936 779 731 1006 769 795 731 - 769 950 846 - 912 898 814 - 909 898 814 - 909 898 814 - 909 898 814 - 836 779 1546 - 836 779 1546 - 836 779 1540 - 9.5 9.7 1540 - 9.5 9.7 1540 - 9.5 9.7 1540 - 9.5 9.7 1540 - 9.5 9.7 1540 - 9.5 9.7	Stg 2	3.5 5.1	5.5			3.5		_ 0.	٠	ىن نى ,	33 22	22	22 -	22 - 221
## NBL NBT NBR EBLINTWBLn1 1546	Maneuver	804	732		0, 0	792	0 - 1		97	972	_	1546	1546 -	1546
Tr 795 731 1006 769 Tr 795 731 - 769 950 846 - 912 898 814 - 909 EB WB S 9.5 9.5 9.7 A A NBL NBT NBR EBLINWBL11 1546 - 836 779 0.002 - 0.004 0.021 A A A A A A	Stage 2	910	816			936				٠				
### NBL NBT NBR EBLn1WBLn1 1546 - 942 898 814 - 909 ### NBL NBT NBR EBLn1WBLn1 1546 - 836 779 0.002 - 9.5 9.7 A A A A A A A	v Cap-1 Maneuver	795 795	731 731	1000		769 769	730		97%	972	972 1546	1546	1546 -	1546 -
EB WB S 9.5 9.7 A A A MRI NBI NBREBLn1WBLn1 1546 - 836 779 0.002 - 0.04 0.021 0.002 - 9.5 9.7 A A - A A A A	Stage 1 Stage 2	950 898	846 814			912 909		10 4						
mt NBL NBT NBREBLn1WBLn1 1546 - 836 779 0.002 - 0.04 0.021 0.73 0 - 9.5 9.7 A A A A A	pproach	EB				WB					NB	NB	NB	NB SB
mt NBL NBT NBREBLn1WBLn1 1546 - 836 779 0.002 - 0.04 0.021 0.7.3 0 - 9.5 9.7 A A - A A	HCM Control Delay, s HCM LOS	9.5 A				9.7 A					0.2	0.2	0.2	0.2 0
1946 - 836 //9 0.002 - 0.04 0.021 5) 7.3 0 - 9.5 9.7 A A - A A	inor Lane/Major Mvmt	NBL	NBT	NBF	REBLIN!	1WBLn1				SBT		SBT	SBT	SBT
s) 7.3 0 - 9.5 A A - A	DM Lane V/C Ratio	0.002			- 0.0	0	4.5							
A A . A	M Control Delay (s)	7.3	0		- 9.		0	_						
	HCM Lane LOS	> >	Þ		A			_						

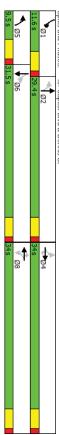
Tumwater Transportation Master Plan SCJ Alliance

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

Projected 2022 without improvements PM Peak Hour

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		2÷,	- <u>1</u>		2÷,	-4	JI.	→		H	÷	
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
Storage Longth (ff)	0061	.1900	1900	000	0061	1000	175	0061	000	0061	000	0061
Storage Length (II)	o C		125	, 0		. 0	2/5			225		
Storage Lanes	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)		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+pt	NA		pm+pt	NA	
Protected Phases		4			00		5	2		_	6	
Permitted Phases	4		4	00		00	2			6		
Detector Phase	4	4	4	00	00	00	5	2		_	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	
Minimum Split (s)	33.5	33.5	33.5	33.5	33.5	33.5	9.5	27.5		11.5	27.5	
Total Split (s)	34.0	34.0	34.0	34.0	34.0	34.0	9.5	29.4		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%	
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	
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 Optimize?							Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None	None	None	Max		None	Max	
Intersection Summary												
Area Type:	Other											
Cycle Length: 75												
Actuated Cycle Length: 59.3	ىن											
Control Type: Actuated-Uncoordinated	coordinated											
College Type: Actuated Cil	COOLGILICICA											

Splits and Phases: 40: Capitol Blvd & Dennis St



Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

HCM Signalized Intersection Capacity Analysis 40: Capitol Blvd & Dennis St

Projected 2022 without improvements

PM Peak Hour

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ns	NS	327 381 347 385 300 1721 C0.17 0.01 0.04 0.01 0.02 0.71 0.02 0.16 0.05 0.05 0.49 21.9 18.3 18.9 18.4 8.0 10.9 1.00 1.00 1.00 1.00 1.00 2 6.8 0.0 0.2 0.1 0.1 1.00 2 87 18.3 19.1 18.5 8.1 11.9 C B B B A B 272 18.7 18.7 11.8 Capacity ratio 0.53 Capacity ratio 0.53 Uilization 56.5% ICU Level of Service B B 0.0 0.00 1.00 1.00 1.00 B 0.00 0.00 B 0.00 0.00 B 0.00 0.00	327 381 347 385 300 1721 c0.17 0.01 0.04 0.01 0.03 0.71 0.02 0.16 0.05 0.09 21.9 18.3 18.9 18.4 8.0 10.9 1.00 1.00 1.00 1.00 1.00 2 6.8 0.0 0.2 0.1 0.1 0.1 0.0 2 87 18.3 19.1 18.5 8.1 11.9 C B B B A B C B B B A B C B B B A B B C B B B B B B B B B B B B B B B B B
ns	NS 4	327 381 347 385 300 1721 C0.17 0.01 0.04 0.01 0.03 0.71 0.02 0.16 0.05 0.05 0.49 21.9 18.3 19.1 18.5 8.1 11.9 C B B B A B 27.2 18.7 18.7 18.7 Capacity ratio 0.53 HCM 2000 Level of Service B Capacity ratio 56.5% ICU Level of Service B B 0.0 0.2 0.1 0.9 B 0.0 0.2 0.1 0.1 0.1 B 0.0 0.2 0.1 B 0.0 0.2 0.1 B 0.0 0.2 B	327 381 347 385 300 1721 C0.17 0.01 0.04 0.01 0.03 0.71 0.02 0.16 0.05 0.05 0.49 21.09 18.3 18.4 8.0 10.9 28.7 18.3 19.1 18.5 8.1 11.9 C B B A B A B B A B B B B B B B B B B B
ns n	NS	20.17 0.01 0.04 0.01 0.03 c0.17 0.01 0.04 0.01 0.03 21.9 18.3 18.9 18.4 8.0 10.9 28.7 18.3 19.1 18.5 8.1 11.9 C	20.17 0.01 0.04 0.01 0.03 0.04 0.01 0.03 0.04 0.01 0.03 0.04 0.01 0.03 0.05 0.49 0.07 0.00 0.04 0.00 0.00 0.00 0.00 0.00
170 40 35 30 20 75 15 740 25 16 740 25 170 40 35 30 20 75 15 740 25 170 170 40 35 30 20 75 15 740 25 170 1700 1900 1900 1900 1900 1900 1900	NS	CO.17 0.01 0.04 0.01 0.03 0.71 0.02 0.16 0.05 0.05 0.49 2.1.9 18.3 18.9 18.4 8.0 10.9 1.00 1.00 1.00 1.00 1.00 1.00 2 6.8 0.0 0.2 0.1 0.1 1.0 2 87 18.3 19.1 18.5 8.1 11.9 C B B B A B A B B A B B A B B A B B B A B	C0.17 0.01 0.04 0.01 0.03 0.71 0.02 0.16 0.05 0.05 0.49 21.9 18.3 18.9 18.4 8.0 10.9 1.00 1.00 1.00 1.00 1.00 1.00 1.00 2 6.8 0.0 1.02 0.1 0.1 1.1 2 7.7 B B B A B C B B B A B C B B B A B C B B B B A B C B B B B B B C B B B B B B C B B B B
190 170 40 35 30 20 75 15 740 25 15 170 40 35 30 20 75 15 740 25 15 170 40 35 30 20 75 15 740 25 15 170 40 35 30 20 75 15 740 25 170 1700 1900 1900 1900 1900 1900 1900	NS	Co.117 0.01 0.04 0.01 0.03 0.71 0.02 0.16 0.05 0.05 0.49 21.9 18.3 18.9 18.4 8.0 10.9 1.00 1.00 1.00 1.00 1.00 1.00 2 6.8 0.0 0.2 0.1 0.1 1.0 2 7 18.3 19.1 18.5 8.1 11.9 C B B B A B C B B B A B Capacity ratio 1.3 HCM 2000 Level of Service B Sum of lost time (s) 1.5 ICU Level of Service B B B B B B B B B B B B B B B B B B B	C0.17 0.01 0.04 0.01 0.03 0.71 0.02 0.16 0.05 0.05 0.49 21.9 18.3 18.9 18.4 8.0 10.9 1.00 1.00 1.00 1.00 1.00 1.00 2 6.8 0.0 0.2 0.1 0.1 1.0 1.0 2 7.7 18.3 19.1 18.5 8.1 11.9 C B B B A B C B B B A B B C B B B B B B B B B B B B B B B B B
ns	170	CO.17 0.01 0.04 0.01 0.03 0.71 0.02 0.16 0.05 0.05 0.49 0.71 0.02 0.16 0.05 0.05 0.49 21.9 18.3 18.9 18.4 8.0 10.9 1.00 1.00 1.00 1.00 1.00 2 6.8 0.0 0.2 0.1 0.1 1.0 2 87 18.3 19.1 18.5 8.1 11.9 C B B B A B 2 C B B B A B 2 C B B B A B 2 C B B B B A B 2 C B B B B B B B 2 C B B B B B B B 2 C B B B B B B B B 2 C B B B B B B B B B 2 C B B B B B B B B B B 2 C B B B B B B B B B B B B B B B B B B	CO.17 0.01 0.04 0.01 0.03 0.71 0.02 0.16 0.05 0.05 0.49 27.9 18.3 18.9 18.4 8.0 10.9 1.00 1.00 1.00 1.00 1.00 1.00 28.7 18.3 19.1 18.5 8.1 11.9 C B B B A B C B B B A B C B B B A B C B B B B B B B B B B B B B B B B B B
18	Iss	CO.17 O.01 O.04 O.01 O.03 O.71 O.02 O.16 O.05 O.05 O.49 21.09 18.3 18.9 18.4 8.0 10.9 1.00 1.00 1.00 1.00 1.00 1.00 2 6.8 0.0 0.2 0.1 0.1 1.0 28.7 18.3 19.1 18.5 8.1 11.9 C B B B A B 27.2 B B, B A B 27.2 B B, B A B 27.2 B B, B B B Capacity ratio 1.3 HCM 2000 Level of Service B Capacity ratio 56.5% ICU Level of Service B Control Service B Control Service B Control Service Co	CO.17 O.01 O.04 O.01 O.03 O.71 O.02 O.16 O.05 O.05 2.19 18.3 18.9 18.4 8.0 10.9 1.00 1.00 1.00 1.00 1.00 1.00 2.87 18.3 19.1 18.5 8.1 11.9 C B B B A B B A B B B B B B B B B B B B
190 170 40 35 30 20 75 15 740 25 170 170 40 35 30 20 75 15 740 25 170 170 40 35 30 20 75 15 740 25 170 1700 1900 1900 1900 1900 1900 1900	NS	CO.17 0.01 0.04 0.01 0.03 0.71 0.02 0.16 0.05 0.05 0.49 2.19 18.3 18.9 18.4 8.0 10.9 2. 6.8 0.0 0.2 0.1 0.1 0.1 1.0 2.8.7 18.3 19.1 18.5 8.1 11.9 2.7.2 B B A B A B B A B B B B B B B B B B B	co.17 0.01 0.04 0.01 0.03 0.71 0.02 0.16 0.05 0.49 21.9 18.3 18.9 18.4 8.0 10.9 2 6.8 0.0 0.2 0.1 0.0 1.00 1.00 2 8.7 18.3 19.1 18.5 8.1 11.9 C B B B A B C B B B A B C B B B B B B B C B B B B B B B B C B B B B
18	NS	CO.17 O.01 0.04 0.01 0.03 CO.17 0.01 0.04 0.01 0.03 CO.18 0.05 0.05 0.05 0.49 CO.19 18.3 18.9 18.4 8.0 10.9 CO.10 1.00 1.00 1.00 1.00 1.00 CO.2 0.1 0.1 1.0 1.00 CO.2 0.1 0.1 11.9 CO.3 18.3 19.1 18.5 8.1 11.9 CO.3 B. B. B. A. B.	CO.17 O.01 0.04 0.01 0.03 CO.17 0.01 0.04 0.01 0.03 CO.17 0.02 0.16 0.05 0.05 0.49 21.9 18.3 18.9 18.4 8.0 10.9 1.00 1.00 1.00 1.00 1.00 1.00 2 6.8 0.0 0.2 0.1 0.1 1.0 2 28.7 18.3 19.1 18.5 8.1 11.9 C B B B A B C B B B A B C B B B B A B B C B B B B B B B B B B B B B B B B B
ns 170 40 35 30 20 75 15 740 25 nj 170 40 35 30 20 75 15 740 25 nj 170 40 35 30 20 75 15 740 25 nj 1900 1900 1900 1900 1900 1900 1900 45 4.5 4.5 4.5 4.5 4.5 4.5 1.00 1.00 1.00 1.00 1.00 1.00 1.00 0.85 1.00 0.95 1.00 1.00 0.85 1.00 0.95 1.00 1.00 0.85 1.00 0.95 1.00 1.00 0.85 1.00 0.95 1.00 1.00 0.85 1.00 0.95 1.00 1.00 0.91 0.91 0.91 0.91 0.91 1.00 0.73 1.00 0.76 1.00 0.30 1.00 1.00 1.079 1.453 1.615 568 3557 1.00 1.079 1.453 1.615 568 3557 1.00 1.091 0.91 0.91 0.91 0.91 0.91 nj 0.91 0.91 0.91 0.91 0.91 0.91 nj 1.091 0.91 0	170	0.71 0.02 0.16 0.05 0.09 21.9 18.3 18.9 18.4 8.0 10.9 21.0 1.00 1.00 1.00 1.00 2 6.8 0.0 0.2 0.1 0.1 0.1 1.00 2 8.7 18.3 19.1 18.5 8.1 11.9 2 C B B B A B 272 18.7 18.7 11.8 272 B B B A B B B A B B B A B B B B B B B	0.71 0.02 0.16 0.05 0.49 21.9 18.3 18.9 18.4 8.0 10.9 1.00 1.00 1.00 1.00 1.00 1.00 2 6.8 0.0 0.2 0.1 0.1 1.0 2 8.7 18.3 19.1 18.5 8.1 11.9 C B B B A B A B C B B B A B B B B B B B B B B B B B B B
18	NS	0,71 0,02 0,16 0,05 0,49 21.9 18.3 18.9 18.4 8.0 10.9 2.8 6.8 0,0 0,2 0,1 0,1 0,1 2.8 7 18.3 19.1 18.5 8.1 11.9 2.7 2 18.7 18.5 8.1 11.9 2.7 2 18.7 18.5 8.1 18.5 2.7 2 18.7 18.5 8.1 18.5 2.7 2 18.7 18.5 8.1 18.5 2.7 2 18.7 18.5 8.1 18.5 2.7 2 18.7 18.5 8.1 18.5 3.7 2 18.7 18.5 8.1 18.5 4 8 8 8 A B 5 8 8 A B 6 8 8 A 8 7 8 8 8 A 8 8 9 9 9 9 9 9 9 9 9	0,71 0,02 0,16 0,05 0,49 21,09 18.3 11,00 1,00 1,00 1,00 2
18	NS	21.9 18.3 18.9 18.4 8.0 10.9 1.00 1.00 1.00 1.00 1.00 1.00 1.	21.9 18.3 18.9 18.4 8.0 10.9 1.00 1.00 1.00 1.00 1.00 1.00 1.
18	NS	21.9 18.3 18.9 18.4 8.0 10.49 21.9 18.3 18.9 18.4 8.0 10.9 1.00 1.00 1.00 1.00 1.00 1.00 2 6.8 0.0 0.2 0.1 1.1.1 2 C B B B B A B C C B B B B B B B C C B B B B B B C C B B B B	21.9 18.3 18.9 18.4 8.0 10.9 2 6.8 0.0 0.2 0.1 1.00 1.00 1.00 1.00 2 8.7 18.3 19.1 18.5 8.1 11.9 2 C B B B A B C B B B A B B B B B B B B B
18	NS	21.9 18.3 18.9 18.4 8.0 10.9 1.00 1.00 1.00 1.00 1.00 1.00 2 6.8 0.0 2 0.1 18.5 8.1 11.9 2 C B B B A B B C C B B B A B B C C B B B B A B B B B B B B B C C B B B B B B B B C C B B B B	21.9 18.3 18.9 18.4 8.0 10.9 1.00 1.00 1.00 1.00 1.00 1.00 2 6.8 0.0 0.2 0.1 0.1 1.0 2 8.7 18.3 19.1 18.5 8.1 11.9 C B B B B A B C B B B B A B B B B B B B B B B B B B B
18	170 40 35 30 20 75 15 740 25 170 40 35 30 20 75 15 740 25 170 40 35 30 20 75 15 740 25 170 40 35 30 20 75 15 740 25 170 40 35 30 20 75 15 740 25 170 40 35 30 20 75 15 740 25 170 40 35 30 20 75 15 740 25 180 1900 1900 1900 1900 1900 1900 1808 1599 100 1.00 0.95 1.00 0.00 1808 1599 1845 1615 1787 3557 17 1808 1599 1845 1615 1787 3557 17 1808 1599 1845 1615 568 3557 17 187 44 38 33 22 82 16 813 27 187 44 38 33 22 82 16 813 27 19ph) 0 29 0 0 62 0 3 0 19ph) 0 231 9 0 55 20 16 813 27 19ph) 0 231 9 0 55 20 16 813 30 19ph 150 150 150 31.3 30.4 3 (s) 150 150 150 31.3 30.4 3 (s) 150 150 150 31.3 30.4 3 (s) 30 30 30 30 30 30 100 24 0.24 0.24 0.25 0.48 0 0.71 0.02 0.16 0.05 0.05 0.49 0 0.71 0.02 0.16 0.05 0.05 0.49 0 0.71 0.02 0.16 0.05 0.05 0.49 0 0 0 0 0 0.05 0.05 0.04 0 0 0 0 0 0.05 0.05 0.05 0 0 0 0 0 0 0 0 0 0	219 18.3 18.9 18.4 8.0 10.9 1.00 1.00 1.00 1.00 1.00 1.00 2 6.8 0.0 0.2 0.1 0.1 1.0 2 8.7 18.3 19.1 18.5 8.1 11.9 C B B B A B 27.2 18.7 18.7 11.8 C B B B A B B B A B B A B B A B B A B B A B B A B B A B B A B B A B B B A B B B A B B B A B B B A B B B A B B B B A B	21.9 18.3 18.9 18.4 8.0 10.9 1.00 1.00 1.00 1.00 1.00 2 6.8 0.0 0.2 0.1 0.1 1.0 2 8.7 18.3 19.1 18.5 8.1 11.9 C B B B A B 27.2 18.7 18.7 11.8 C B B B A B 27.2 18.7 11.8 C B B B A B 32.2 18.7 11.8 C B B B A B 4 C B B B A B 32.2 18.7 11.8 C B B B B B B 32.4 11.8 C B B B B B B 32.4 11.8 B Capacily ratio 0.53 Utilization 56.5% ICU Level of Service B 15
18	NS	100 100	1.00 10.0
18	NS	1.00 1.00 1.00 1.00 1.00 1.00 1.00 2 6.8 0.0 0.2 0.1 0.1 1.1 2 8.7 18.3 19.1 18.5 8.1 11.9 3 C B B B A B A B A B A B A B A B B A B B A B B B A B	1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
18	NS	1.00 1.00 1.00 1.00 1.00 1.00 1.00 2 6.8 0.0 0.2 0.1 0.1 1.0 1.00 2 C 8 B B A B A B C B B B B A B B C B B B B B B B C B B B B B B B C C B B B B	1.00 1.00 1.00 1.00 1.00 1.00 2 6.8 0.0 0.2 0.1 0.1 1.0 2 C B B B A B 277.2 B B B A B 277.2 B B B B A B C B B B B B B B C B B B B B B B B B B
ns 170 40 35 30 20 75 15 740 25 170 40 35 30 20 75 15 740 25 170 1900 1900 1900 1900 1900 1900 1900 1900 45 4.5 4.5 4.5 4.5 4.5 4.5 1.00 0.85 1.00 0.95 1.00 1.00 0.85 1.00 0.95 1.00 1.00 0.85 1.00 0.95 1.00 1.00 0.85 1.00 0.95 1.00 1.00 0.85 1.00 0.95 1.00 1.00 0.96 1.00 0.97 1.00 0.95 1.00 1.00 0.96 1.00 0.97 1.00 0.95 1.00 1.00 1.07 1.091 0.91 0.91 0.91 0.91 1.07 1.091 0.91 0.91 0.91 0.91 0.91 1.091 0.91 0.91 0.91 0.91 0.91 0.91 187 44 38 33 22 82 16 813 27 19hh 0 231 9 0 55 20 16 837 0 19h 17h 17h 0.9h 0.9h 0.9h 1.9h 1.9h 19h 19h 19h 19h 19h 19h 19h 19h 19h 19h 19h 19h 19h 19h 19h (s) 150 150 150 150 313 30.4 (s) 150 150 150 31.3 30.4 150 150 150	NS	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 1.00 1.00 1.00
18	170 40 35 30 20 75 15 740 25 170 40 35 30 20 75 15 740 25 170 40 35 30 20 75 15 740 25 170 40 35 30 20 75 15 740 25 170 40 35 30 20 75 15 740 25 170 40 35 30 20 75 15 740 25 180 1900 1900 1900 1900 1900 1900 100 1.00 1.00 1.00 1.00 0.95 1.00 0.95 100 1.00 0.95 1.00 0.95 1.00 0.95 110 120 120 1.00 0.95 1.00 0.95 110 120 120 1.00 0.95 1.00 0.95 1170 120 120 1.00 0.95 1.00 0.95 1170 120 120 1.00 0.95 1.00 0.95 1170 120 120 1.00 0.95 1.00 0.95 1170 120 120 1.00 0.95 0.91 0.91 120 123 190 0.91 0.91 0.91 0.91 120 123 190 0.95 0.96 1.95 0.91 120 123 190 0.95 0.96 1.96 1.96 120 123 190 0.95 0.96 1.96 1.96 120 120 120 1.00 1.00 1.00 120 120 120 1.00 1.00 120 120 1.00 1.00 1.00 120 120 1.00 1.00 1.00 120 120 1.00 1.00 1.00 120 120 1.00 1.00 1.00 120 120 1.00 1.00 1.00 120 120 1.00 1.00 1.00 120 120 1.00 1.00 1.00 120 120 1.00 1.00 1.00 120 120 1.00 1.00 1.00 120 120 1.00 1.00 1.00 120 120 1.00 1.00 1.00 120 120 1.00 1.00 1.00 120 120 1.00 1.00 1.00 120 1.00 1.00 1.00	2 6.8 0.0 0.2 0.1 0.0 1.00 2.2 0.1 0.1 0.0 1.00 2.2 0.1 0.1 0.1 0.0 1.00 2.2 0.1 0.1 0.1 0.0 1.00 2.2 0.1 0.1 0.1 0.0 1.00 2.2 0.1 0.1 0.1 0.0 1.00 2.2 0.1 0.1 1.8 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5	1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
18	No. 170 40 35 30 20 75 15 740 25 10 170 40 35 30 20 75 15 740 25 1	2 6.8 0.0 0.2 0.1 0.1 1.0 28.7 18.3 19.1 18.5 8.1 11.9 28.7 2 8 8 8 A 8 27.2 8 18.7 18.8 27.2 8 18.7 18.8 27.2 8 18.7 18.8 27.2 8 8 8 A 18.8 27.2 8 8 8 B B B B B B B B B B B B B B B B	2 6.8 0.0 0.2 0.1 0.1 1.0 2.87 18.3 19.1 18.5 8.1 11.9 2.87 2.8 B B A B 2.72 B B B A B 2.72 B B B B B 2.73 B B B B B 2.74 B B B B B B 2.75 B B B B B B 2.76 B B B B B 2.77 B B B B B B 2.77 B B B B B B 2.78 B B B B B 2.79 B B B B B 2.70 B B B 2.70 B B 3.70
190 170 40 35 30 20 75 15 740 25 170 170 40 35 30 20 75 15 740 25 170 170 40 35 30 20 75 15 740 25 170 1700 1900 1900 1900 1900 1900 1900	NS	2	2
18	NS	2	2
18	NS	287 183 19.1 18.5 8.1 11.9 C B B B A B 27.2 118.7 118.8 C B B B B A B B B B B B B B B B B B B B	287 183 19.1 18.5 81 11.9 C B B B A B 272 187 188 C B B B B A B C B B B B B B B C B B B B B B B B B
18	No.	28.7 18.3 19.1 18.5 8.1 11.9 C B B B A B 27.2 18.7 11.8 C B B B B A B C B B B B B B B B B B B B B B B B B B	28.7 18.3 19.1 18.5 8.1 11.9 C B B B A B 27.2 18.7 18.8 C B B B B A B 11.8 C B B B B B B 11.8 C B B B B B 11.8 C B B B B B 11.8 B 11.8 C B B B B B B 11.8 B 11.8 C B B B B B B B 11.8 C B B B B B B B 11.8 C B B B B B B B B 11.8 C B B B B B B B B B B B B B B B B B B B
18	NS	28.7 18.3 19.1 18.5 8.1 11.9 C B B B A B 27.2 18.7 11.8 C B B T T T T T T T T T T T T T T T T T	28.7 18.3 19.1 18.5 8.1 11.9 C B B B A B 27.2 18.7 11.8 C B B B B A B C B B B B B B B B B B B B B B B B B B
18	NS	28.7 18.3 19.1 18.5 8.1 11.9 C B B A B C B B A B C B B B B C B B B B C B B B B C B B B B	28.7 18.3 19.1 18.5 8.1 11.9 C B B A B A B 27.2 18.7 18.8 B A B C B B B B B C B B B B B B C B B B B
18	No.	28.7 18.3 19.1 18.5 8.1 11.9 27.2 B B A B B A B B B B B B B B B B B B B	28.7 18.3 19.1 18.5 8.1 11.9 C B B B A 18.8 27.2 18.7 18.9 B B B B B B B B B B B B B B B B B B B
ISS A	NS	C	C B B B B B B B B B B B B B B B B B B B
18	NS	C B B B A 1.8 27.2 B 18.7 11.8 C B B B B B B B B B B B B B B B B B B	C B B B A B B A B B B B B B B B B B B B
18	NS	C B B B A B C B B B A B C B B B A B C B B B B A B C B B B B B B B B B B B B B B B B B B	C B B B A B 272 187 118 C B B B B A B C B B B B A B B B B A B B B B B B B B B
18	NS	C B B B A B A B C B B B A B B A B C B B B A B B B A B B A B B A B B A B B A B B A B B B A B B A B B B A B B A B B B B A B B B B B B A B	C B B B A B 11.8 C B B B A B B A B C B B B A B B B A B B B A B B A B B B A B B A B B A B B A B B A B B B A B B A B B B B A B B B B A B B B B A B B B B B A B
18	NS	C B B A B C B B A B C B B C B C B B C B C C B B C C C Capacity ratio C Capacity ratio L(S) L(S) L(S) L(S) L(S) L(S) L(S) L(S)	C B B B A B 27.2 18.7 11.8 C B B B A B C B B B A B C B B B A B C B B B A B B B A B B A B C B B B A B B A B C B B B A B B A B B B A B B A B B A B B C B B B A B B A B B A B B C B B B A B B A B B C B B B A B B A B B A B B C B B B A B B A B B A B B C B B B A B B A B B A B B C B B B A B B A B B A B B C B B B A B B A B B A B B C B B B A B B A B B A B B C B B B A B B A B B A B B C B B B A B B A B B A B B C B B B A B B A B B A B B C B B B A B B A B B A B B C B B B A B B A B B C B B B A B B A B B A B B C B B B A B B A B B A B B C B B B A B B A B B A B B C B B B A B B A B B A B B C B B B A B B A B B A B B A B B C B B B A B B A B B A B B A B B A B B A B B C B B B A B B A B B A B B A B B A B B A B B A B B A B B A B B A B B A B B A B B B A B B A B B B B A B B B B A B B B A B B B A B B B A B B B A B B B A B B B A B B B B A B B B B A B B B B A B B B B A B B B B A B B B B A B B B B A B B B B A B B B B A B B B B A B B B B A B B B B A B B B B A B B B B A B B B B A B B B B A B B B A B B B A B B B A B B B A B B B A B B B A B B B A B B B B A B B B B A B B B B A B B B A B B B B A B B B B A B B B B A B B B B A B B B B B A B B B B B A B
18	No.	C B B A B A B A B A B A B A B A B A B A	C B B A B A B A B B B A B B A B B B B A B B B B A B B B B A B B B B A B B B A B B B B A B B B B A B B B B A B B B A B B B B A B B B B A B B B B A B B B B A B B B B B A B B B B A B B B B A B B B B A B B B B B A B B B B B A B B B B B B B B B A B
18	No. 170 40 35 30 20 75 15 740 25 15 170 40 35 30 20 75 15 740 25 15 170 40 35 30 20 75 15 740 25 15 170 40 35 30 20 75 15 740 25 15 170 40 35 30 20 75 15 740 25 15 170 40 35 30 20 75 15 740 25 15 170 40 35 30 20 75 15 740 25 15 170 170 170 170 170 170 170 170 170 170	272 18.7 11.8 C B B B I I I I I I I I I I I I I I I I I	27.2 18.7 1.8 C B B Blay Capacity ratio 0.53 (Capacity ratio 62.8 Sum of lost time (s) Utilization 56.5% ICU Level of Service
18	No. 170 40 35 30 20 75 15 740 25 15	272 18.7 11.8 C B B B slay 13.3 HCM 2000 Level of Service Capacity ratio 0.53 Capacity ratio 62.8 Sum of lost time (s) h (s) 62.8 Sum of lost time (s) 15 ICU Level of Service	27.2 18.7 11.8 C B B B C C B B B C C B C C C C C C C C
18	No. 170 40 35 30 20 75 15 740 25 15 170 40 35 30 20 75 15 740 25 15 170 40 35 30 20 75 15 740 25 15 170 40 35 30 20 75 15 740 25 15 170 40 35 30 20 75 15 740 25 15 170 170 40 35 30 20 75 15 740 25 15 170 170 170 40 35 30 20 75 15 740 25 15 170 170 170 170 170 170 170 170 170 170	272 18.7 11.8 C B B B r r alay Capacity ratio 0.53 Chapacity ratio 62.8 Utilization 56.5% Light 11.3 Level of Service Light 15 Light 15 Service	272 18.7 11.8 C B B B H 1.3.3 HCM 2000 Level of Service Capacity ratio 0.53 Ch (5) 62.8 Sum of lost time (5) Utilization 56.5% ICU Level of Service
18	NS	27.2 18.7 11.8 C B B B 1 1 13.3 HCM 2000 Level of Service Capacity ratio 0.53 Utilization 56.5% ICU Level of Service	27.2 18.7 11.8 B C B B B I 13.3 HCM 2000 Level of Service Capacity ratio 0.53 Capacity ratio 62.8 Sum of lost time (\$) Utilization 56.5% ICU Level of Service
18	NS	27.2 18.7 11.8 C B B B 1.3.3 HCM 2000 Level of Service Capacity ratio 0.53 Sum of lost time (s) Utilization 56.5% ICU Level of Service	27.2 18.7 11.8 C B B K 13.3 HCM 2000 Level of Service Capacity ratio 0.53 Ch (\$) 62.8 Sum of lost time (\$) Utilization 56.5% ICU Level of Service 15
18	NS	List C B B B C B HCM 2000 Level of Service Capacity ratio 0.53 Sum of lost time (\$) Utilization 56.5% ICU Level of Service	LIS C B B B C B B B I 13.3 HCM 2000 Level of Service Capacity ratio 0.53 Capacity ratio 0.53 Sum of lost time (s) Utilization 56.5% ICU Level of Service 15
18	No.	Lay 13.3 HCM 2000 Level of Service Capacity ratio 0.53 C.2.8 Sum of lost time (s) Level of Service 15.5% ICU Level of Service 15	C B B B r 13.3 HCM 2000 Level of Service Capacity ratio 0.53 Utilization 56.5% ICU Level of Service 15
18	No.	C B B I 1 13.3 HCM 2000 Level of Service Capacity ratio 0.53 h (s) 6.2.8 Sum of lost time (s) Ulitzation 56.5% ICU Level of Service	C B B slay 13.3 HCM 2000 Level of Service Capacity ratio 0.53 Sum of lost time (s) Utilization 56.5% ICU Level of Service 15
18	No. 170 40 35 30 20 75 15 740 25 16 170 40 35 30 20 75 15 740 25 15 740 25 16 170 40 35 30 20 75 15 740 25 16 170 40 35 30 20 75 15 740 25 16 170 170 40 35 30 20 75 15 740 25 16 170 170 40 35 30 20 75 15 740 25 16 170 170 170 170 170 170 170 170 170 170	C B B r r slay 13.3 HCM 2000 Level of Service Capacity ratio 0.53 h (s) 62.8 Sum of lost time (s) h (s) 56.5% ICU Level of Service	C B B (a) 13.3 HCM 2000 Level of Service (b) 28 Sum of lost time (\$) (b) 62.8 Sum of lost time (\$) (c) 56.5% ICU Level of Service (c) 15
18	No. 170 40 35 30 20 75 15 740 25 10 170 40 35 30 20 75 15 740 25 15 740 100 100 100 100 100 100 100 100 100 1	C B B r lay Lay 13.3 HCM 2000 Level of Service Capacity ratio 0.53 h (s) 62.8 Sum of lost time (s) Utilization 56.5% ICU Level of Service	C B B 13.3 HCM 2000 Level of Service Capacity ratio 0.53 Cum of lost time (s) h (s) 62.8 Sum of lost time (s) Utilization 56.5% ICU Level of Service 15
18	NS	C B B B B B B B B B B B B B B B B B B	C B B B B B B B B B B B B B B B B B B
18	NS	13.3 HCM 2000 Level of Service Capacity ratio 0.53	Islay 13.3 HCM 2000 Level of Service Capacity ratio 0.53 Capacity ratio 0.53 Sum of lost time (s) Utilization 56.5% ICU Level of Service 15
18	NS	lay 13.3 HCM 2000 Level of Service Capacity ratio 0.53 h (s) 62.8 Sum of lost time (s) Uilization 55.5% ICU Level of Service	lay 13.3 HCM 2000 Level of Service Capacity ratio 0.53 Capacity ratio 62.8 Sum of lost time (s) Utilization 56.5% ICU Level of Service
170 40 35 30 20 75 15 740 25 170 40 35 30 20 75 15 740 25 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 1372 1599 1453 1615 568 3557 1187 44 38 33 22 82 16 813 27 1900 1901 0.91 0.91 0.91 0.91 0.91 1187 44 38 33 22 82 16 813 27 1187 44 38 33 22 82 16 813 27 1187 44 38 33 22 82 16 837 0 1187 148 190 0.55 20 16 837 0 1180 150 150 150 31.3 30.4 120 150 150 150 31.3 30.4 120 150 150 150 31.3 30.4 120 150 150 150 31.3 30.4 120 121 121 120 120 120 120 120 120 121 120 120 120 120 120 120 120 120 120 120 120 120 120 120 120 120 100 100 100 120 120 100 100 100 120 120 100 100 120 120 183 18.9 18.4 8.0 10.9 120 120 18.3 18.9 18.4 8.0 10.9 120 120 18.5 8.1 11.9 120 120 18.5 8.1 11.9 120 120 18.5 8.1 11.9 120 120 18.5 8.1 11.9 120 120 18.5 8.1 11.9 120 120 18.8 18.7 11.8 120 120 120 120 120 120 120 120 130 120 120 120 120 130 130 120 120 130 130 130 121 122 133 134 135 122 133 134 135 131 130 123 134 135 135 135 135 124 125 135 135 135 135 125 135 135 135 135 135 125 135 135 135 135 135 125 135 135 135 135 135 125 135 135 135 135 135 125 135 135 135 135 135 125 135 135 135 135 135 125 135 135 135 135 125 135 135 135 135 125 135	No.	I 13.3 HCM 2000 Level of Service Capacity ratio 0.53 Sum of lost time (s) 6.5.28 Sum of lost time (s) 15.6.5% ICU Level of Service 15	Alay 13.3 HCM 2000 Level of Service Capacity ratio 0.53 Sum of lost time (s) Utilization 56.5% ICU Level of Service 15
18	S	lay 13.3 HCM 2000 Level of Service Capacity ratio 0.53 Sum of lost time (s) 62.8 Sum of lost time (s) 15 Level of Service 15	13.3 HCM 2000 Level of Service Capacity ratio 0.53 Sum of lost time (\$) 62.8 Sum of lost time (\$) Utilization 56.5% ICU Level of Service 15
18	Signature Sign	13.3 HCM 2000 Level of Service Capacity ratio	13.3 HCM 2000 Level of Service 13.3 HCM 2000 Level of Service 13.3 HCM 2000 Level of Service 15.4 CU Level of Service 1
18	NS	13.3 HCM 2000 Level of Service	13.3 HCM 2000 Level of Service 13.3 HCM 2000 Level of Service 15.3 HCM 2000 Level of Service 15.4 HCM 200
18	No.	Slay 13.3 HCM 2000 Level of Service Capacity ratio 0.53 (s) 62.8 Sum of lost time (s) Utilization 56.5% ICU Level of Service 15	alay 13.3 HCM 2000 Level of Service Capacity ratio 0.53 Capacity ratio 62.8 Sum of lost time (s) Utilization 56.5% ICU Level of Service 15 15
18	No.	slay 13.3 HCM 2000 Level of Service Capacity ratio 0.53 h (s) 62.8 Sum of lost time (s) Ullization 56.5% ICU Level of Service 15	slay 13.3 HCM 2000 Level of Service Capacity ratio 0.53 h (s) 62.8 Sum of lost time (s) Utilization 56.5% ICU Level of Service 15
18	S	HCM 2000 Level of Service Capacity ratio	13.3 HCM 2000 Level of Service
18	Signature Sign	Capacity ratio 0.53 (Capacity ratio 0.53 (A) 62.8 Sum of lost time (s) Utilization 56.5% ICU Level of Service 15	Page 15.3 Fig. 2000 Level of Service 15.5 Fig. 3 Sum of lost time (s) Lulization 56.5% ICU Level of Service 15
18	NS	Capacity ratio 0.53 Capacity ratio 0.53 (Capacity 0	Capacity ratio 0.53 Capacity ratio 0.53 h (s) 62.8 Sum of lost time (s) Utilization 56.5% ICU Level of Service
15	No.	Capacity ratio 0.53 L(s) 62.8 Sum of lost time (s) Utilization 56.5% ICU Level of Service 15 15	Capacity ratio 0.53 h (s) 62.8 Sum of lost time (s) Utilization 56.5% ICU Level of Service 15
ns	170 40 35 30 20 75 15 740 25 170 40 35 30 20 75 15 740 25 170 40 35 30 20 75 15 740 25 170 40 35 30 20 75 15 740 25 170 40 35 30 20 75 15 740 25 180 1900 1900 1900 1900 1900 1900 1900 1808 1599 1405 1415 1415 1415 1415 187 41 43 43 43 25 1415 1415 1415 187 44 43 33 22 20 3 0 197 197 197 197 197 197 197 197 187 44 38 33 22 20 3 0 197 197 198 1453 1615 568 3557 17 187 44 38 33 22 20 3 0 197 197 197 197 197 197 197 197 198 198 199 1453 1615 568 3557 17 199 199 199 199 199 199 199 199 199 199 199 199 199 199 199 199 190 231 9 0	Capacity ratio 0.53 h (s) 62.8 Sum of lost time (s) h (s) 56.5% ICU Level of Service	Capacity ratio 0.53 h (s) 62.8 Sum of lost time (s) Utilization 56.5% ICU Level of Service 15
n) 170 40 35 30 20 75 15 740 25 15 170 40 35 30 20 75 15 740 25 170 170 40 35 30 20 75 15 740 25 170 1700 1900 1900 1900 1900 1900 1900	170 40 35 30 20 75 15 740 25 170 40 35 30 20 75 15 740 25 170 40 35 30 20 75 15 740 25 170 40 35 30 20 75 15 740 25 170 40 35 30 20 75 15 740 25 170 40 35 30 20 75 15 740 25 170 40 35 30 20 75 15 740 25 170 40 35 30 20 75 15 740 25 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 141 140 140 140 140 141 140 140 140 140 141 140 140 140 140 141 140 140 140 140 141 140 140 140 140 150 150 150 150 313 30.4 150 150 150 150 313 30.4 150 150 150 150 313 30.4 150 150 150 150 313 30.4 150 150 150 150 313 30.4 150 150 150 150 313 30.4 150 150 150 150 313 30.4 150 150 150 150 313 30.4 150 150 150 150 313 30.4 150 150 150 150 313 30.4 150 150 150 150 313 30.4 150 150 150 150 313 30.4 150 150 150 150 313 30.4 150 150 150 150 313 30.4 150 150 150 150 313 30.4 150 150 150 150 313 30.4 150 150 150 150 100 100 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150	Capacity ratio U.53 h (s) 62.8 Sum of lost time (s) h (s) 65.5% ICU Level of Service 15	Capacity ratio 0.53 h (s) 62.8 Sum of lost time (s) Utilization 56.5% ICU Level of Service 15
S S S A C C C C C C C C	S	Utilization 56.5% ICU Level of Service	Constant 62.8 Sum of lost time (s) h (s) Utilization 56.5% ICU Level of Service 15
ISS A) 170 40 35 30 20 75 15 740 25 15 170 40 35 30 20 75 15 740 25 15 170 170 40 35 30 20 75 15 740 25 170 1900 1900 1900 1900 1900 1900 1900	Signature Sign	h (s) 62.8 Sum of lost time (s) Utilization 56.5% ICU Level of Service 15	h (s) 62.8 Sum of lost time (s) Utilization 56.5% ICU Level of Service 15
170 40 35 30 20 75 15 740 25 170 40 35 30 20 75 15 740 25 170 170 40 35 30 20 75 15 740 25 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 187 14 38 33 22 82 16 813 70 187 14 38 33 22 82 16 837 00 187 170 170 170 170 170 170 170 187 170 170 170 170 170 170 170 180 170 170 170 170 170 170 170 180 180 180 180 180 170 180 180 180 180 180 170 180 180 180 180 170 170 180 180 180 180 170 170 180 180 180 180 170 170 180 180 180 180 170 180 180 180 180 170 180 180 180 180 180 180 180 180 180 180 180 180 180 180 180 180 180 180 180 180 180 180 180 180 180 180	Signature Sign	h (s) 62.8 Sum of lost time (s) Utilization 56.5% ICU Level of Service 15	h (s) 62.8 Sum of lost time (s) Utilization 56.5% ICU Level of Service 15
Is 170 40 35 30 20 75 15 740 25 170 40 35 30 20 75 15 740 25 170 170 40 35 30 20 75 15 740 25 170 170 40 35 30 20 75 15 740 25 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170	No.	Ulization 56.5% ICU Level of Service	Utilization 56.5% ICU Level of Service
n) 170 40 35 30 20 75 15 740 25 170 170 40 35 30 20 75 15 740 25 170 170 40 35 30 20 75 15 740 25 170 1700 1900 1900 1900 1900 1900 1900	No.	Utilization 56.5% ICU Level of Service	Utilization 56.5% ICU Level of Service
n) 170 40 35 30 20 75 15 740 25 15 170 40 35 30 20 75 15 740 25 170 170 40 35 30 20 75 15 740 25 170 1700 1900 1900 1900 1900 1900 1900	Signature Sign	Utilization 56.5% ICU Level of Service 15	Utilization 56.5% ICU Level of Service
170 40 35 30 20 75 15 740 25 170 40 35 30 20 75 15 740 25 170 170 40 35 30 20 75 15 740 25 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170	Signature Sign	Utilization 56.5% ICU Level of Service	Ullization 50.5% ICU Level of Service
Is 170 40 35 30 20 75 15 740 25 170 40 35 30 20 75 15 740 25 170 170 40 35 30 20 75 15 740 25 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170	Signature Sign	15	15
n) 170 40 35 30 20 75 15 740 25 16 170 40 35 30 20 75 15 740 25 170 170 40 35 30 20 75 15 740 25 170 1700 1900 1900 1900 1900 1900 1900	Sis		5
170 40	170		5
170 40 35 30 20 75 15 740 25 170 40 35 30 20 75 15 740 25 170 40 35 30 20 75 15 740 25 1700 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 145 4.	170		2 (1990) 1 (200)

Tumwater Transportation Master Plan SCJ Alliance

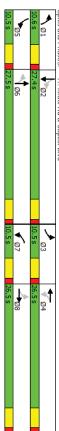
Lanes, Volumes, Timings
41: Israel Rd & Capitol Blvd

Projected 2022 without improvements

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	_#	¥		_#	ð,		J	*		JI.	♣	
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	150		0	150		0	100		0
Storage Lanes	_		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)		2751			725			934			1337	
Travel Time (s)		62.5			16.5			21.2			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 (%)												
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	ω	8		7	4		_	6		5	2	
Permitted Phases	8			4			6			2		
Detector Phase	ω	8		7	4		_	6		5	2	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0			6.0		6.0	6.0	
Minimum Split (s)	10.5	26.5		10.5	26.5			26.5		10.5	26.5	
Total Split (s)	10.5	26.5		10.5	26.5		10.6	27.5		10.5	27.4	
Total Split (%)	14.0%	35.3%		14.0%	35.3%			36.7%			36.5%	
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			Lag			Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes			Yes			Yes	
Recall Mode	None	None		None	None		None	Max			Max	
Intersection Summary												
Area Type:	Other											
Cycle Length: 75												
Actuated Cycle Length: 67.5	51											
Natural Cycle: 75												

Splits and Phases: 41: Israel Rd & Capitol Blvd

Control Type: Actuated-Uncoordinated



Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

HCM 2010 Signalized Intersection Summary
41: Israel Rd & Capitol Blvd

Projected 2022 without improvements
PM Peak Hour

	-	Ļ	1	4	†	<i>></i>	۶	→	*	•	←	4
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	æ	₩		H	₩		H	↑		H	↑	
Traffic Volume (veh/h)	95	160	150	105	215	150	120	335	25	120	575	105
ruture volume (ven/n)	2 6	9	150	- G	215	1 50	120	335	1 25	120	2/5	105
Number	<u>د</u>	ο α	- a	> ~	4 0	0 4	> -	0 0	0 0	0 0	o N	_
Ped-Rike Adi(A_nhT)	30	c	100	3 0	c	3 0	180	c	300	3 0	c	100
Parking Bus. Adi	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1863	1863	1900	1881	1881	1900	1881	1881	1900
Adj Flow Rate, veh/h	106	178	100	117	239	167	133	372	28	133	639	117
Adj No. of Lanes	_	_	0	_	_	0	_	2	0	_	2	
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	_	_	_	_	_	
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
Grp Volume(v), veh/h	106	0	278	117	0	406	133	196	204	133	378	378
Grp Sat Flow(s),veh/h/ln	1810	0	1787	1774	0	1737	1792	1787	1837	1792	1787	1784
U Serve(g_s), s	2.9	0.0	9.6	ن د	0.0	15.8	د 4 م	6.0	6.0	ى 4 د	13.0	3 5
Prop In Lane	1.00	ć	0.36	1.00	ċ	0.41	1.00	9	0.14	1.00	0	0.3
Lane Grp Cap(c), veh/h	288	0	488	388	0	478	339	575	591	475	575	57.
V/C 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(i)	1.00	0.00	3	170	0.00	3 .00	15.00	100	100	1.00	30.0	300
Incr Delay (d2) s/yeh	0.0	0.0	13	0.5	0.0	24.5	0.4	16	16.5	0.4	5.8	5.0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.0	4.9	1.6	0.0	9.1	1.7	3.2	သ	1.7	7.3	7.
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.
LnGrp LOS	В		0	В		o	В	C	0	В	0	
Approach Vol, veh/h		384			523			533			889	
Approach Delay, s/veh		22.4			32.0			19.2			24.9	
Approach LOS		С			С			В			C	
Timer	_	2	ω	4	5	6	7	00				
Assigned Phs	_	2	သ	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.1	27.5	9.8	24.2	10.1	27.5	9.9	24.0				
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	6.1	22.9	6.0	22.0	6.0	23.0	6.0	22.0				
Green Ext Time (g_c+11), S	5.4	15.1	0.0	10	5.4	7.0	0.3	3.7				
		:			:	:						
Inchange of Delay			2									
HCM 2010 Ctrl Delay			24.8									
LICINI ZO IO EOS			C									

Tumwater Transportation Master Plan SCJ Alliance

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	
Conflicting Pads #/hr	ے د	0 0			5	0	000	0 0	
Sign Control		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	95	95			95	95	95	95	
Heavy Vehicles, %	_	_			_	_	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							305		
Critical Hdwy	4.11						6.4	6.2	
Critical Hdwy Stg 1							5.4		
Critical Hdwy Stg 2							5.4		
Follow-up Hdwy	2.209				l.		3.5	3 	
Pot Cap-1 Maneuver	1325						625	8/2	
Stage 1					ı,		859		
Stage Z							834		
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							В		
Minor Lane/Major Mvmt	EBL	EBT .	WBT '	WBR SBLn1	12				
Capacity (veh/h)	1325		·	- 708	8				
HCM Lane V/C Ratio	0.044	, ,		_	. S.				
HCM Control Delay (s)	7.8	, 0		- 11.8	ώ.				
HCM 95th %tile O(veh)	0 A				_ 0				
TICIM ZOUR COVERY	-				-				

Synchro 9 Report 6/10/2016

Tumwater Transportation Master Plan SCJ Alliance

HCM 2010 TWSC 43: Kirsop Rd & 66th Ave

Projected 2022 without improvements
PM Peak Hour

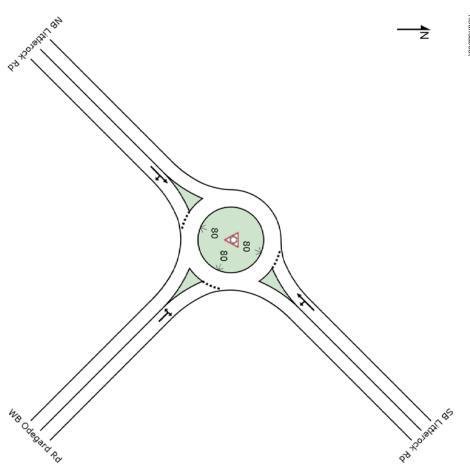
EBR WBL WBT WBR 145 5 1 5 145 5 1 5 145 5 1 5 0 0 0 0 0 Stop Stop Stop Stop None - None 0 - None 0 - 1 173 6 1 6 Minor1 Mino	WBL WBT 5 1 5 1 0 0 0 0 Slop Slop - 0 - 0 84 84 0 0 6 1 729 663 592 592 137 71	WBL WBT WBR NBL NBT 5 1 5 240 15 5 1 5 240 15 6 0 0 0 0 0 0 Slop Slop Slop Free Free - None - None - 0 - 0 84 84 84 84 84 84 84 84 84 84 84 84 84 8
WBT 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	WBT WBR 1 5 1 5 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	WBT WBR NBL NBT 1 5 240 15 1 5 240 15 1 5 240 15 0 0 0 0 0 Slop Slop Free Free - None 0 0 0 84 84 84 84 84 0 0 1 1 1 6 286 18 663 21 60 0
WBR 5 5 5 5 0 0 None 8.4 8.4 6.6 6.6	≤	NBL NBT 240 15 240 15 240 15 0 0 Free Free 0 84 84 1 1 286 18 Najor1 00 00 00 00 00 00 00 00 00 00 00 00 00
	NBL 240 240 0 0 Free - - - - - - - - - - - - - - - - - -	NBT 15 1 18 1 18 1 18 1 18 1 18 1 18 1 18
NBT NBR 15 5 15 5 15 7 16 7 17 18 7 18 84 84 84 84 84 84 84 84 84 84 84 84 84	NBR 5 5 5 5 5 6 None None None 0 6	
	≤	SBL 5 5 5 6 7 7 7 7 8 8 4 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9
NBR 5 5 5 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	SBL SBT 5 10 5 10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	SBT 10 10 10 10 10 10 10 10 10 10 10 10 10

Tumwater Transportation Master Plan SCJ Alliance

SITE LAYOUT

♥ Site: 44) Littlerock Rd at Odegard Rd

Projected 2022 without improvements PM Peak Hour Roundabout



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MOVEMENT SUMMARY

▼ Site: 44) Littlerock Rd at Odegard Rd

Projected 2022 without improvements PM Peak Hour Roundabout

Movem	Novement Performance - Vehicles	ance - Veh	nicles								
Mov	OD	Demand Flows	=lows	Deg.	Average	Level of	95% Back of Queue	Queue	Prop.	Effective	Average
ō				Satn	Delay				Queued	Stop Rate	Speed
										per veh	mph
SouthEa	SouthEast: WB Odegard Rd	rd Rd									
з х	2	16	0.0	0.034	14.9	LOS B	0.2	4.6	0.70	0.73	32.6
18x	R2	OI	0.0	0.034	9.5	LOS A	0.2	4.6	0.70	0.73	31.8
Approach	ä	22	0.0	0.034	13.5	LOS B	0.2	4.6	0.70	0.73	32.4
NorthEast: SB Li	st: SB Littlerock Rd	× Rd									
×	2	⇉	1.0	0.677	9.7	LOS A	9.6	242.9	0.26	0.38	36.6
6x	Т1	823	1.0	0.677	4.4	LOS A	9.6	242.9	0.26	0.38	36.6
Approach	ä	833	1.0	0.677	4.5	LOS A	9.6	242.9	0.26	0.38	36.6
SouthW	SouthWest: NB Littlerock Rd	ck Rd									
2 _x	Т1	790	1.0	0.641	4.3	LOS A	7.5	189.4	0.17	0.38	37.0
12x	R2	СЛ	1.0	0.641	4.2	LOSA	7.5	189.4	0.17	0.38	36.0
Approach	ä	796	1.0	0.641	4.3	LOS A	7.5	189.4	0.17	0.38	37.0
All Vehicles	des	1651	1.0	0.677	4.5	LOS A	9.6	242.9	0.22	0.39	36.7
I evel of S	Level of Service (LOS) Method: Delay & v/c (HCM 2010)	Method: De	av & v/c	(HCM 2010)							

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 M3D).

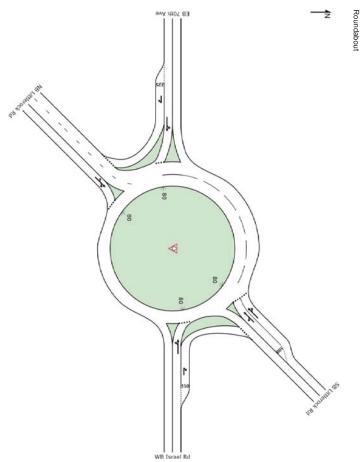
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation

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SITE LAYOUT

Y Site: 45) Littlerock Rd at Israel Rd

Projected 2022 without improvements PM Peak Hour Roundabout



MOVEMENT SUMMARY

W Site: 45) Littlerock Rd at Israel Rd

Projected 2022 without improvements PM Peak Hour 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 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 M3D).

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

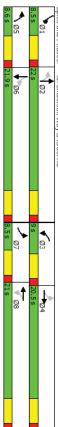
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Lanes, Volumes, Timings 46: Linderson Way & Israel Rd

Projected 2022 without improvements PM Peak Hour

SBL SBT SBC SBT SBT SBT SBC		21.5 8.5 22.0 8.5 3.5 3.5 3.5 3.5 1.0 1.0	o. 4.0 1 6	
a % a 5 5 5 5 5 5 5 5 6 1 5 1 5 5 5 5 5 5 1 6 1 5 5 5 5	1.0 0.0 4.5 Lead Yes None	4.0 8.5 8.5 14.2% 1.0	4.0	0.95 1% pm+pt 1

Splits and Phases: 46: Linderson Way & Israel Rd



Tumwater 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

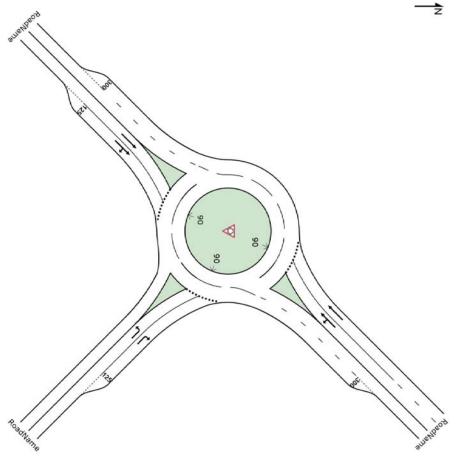
HCM 2010 Ctrl Delay HCM 2010 LOS	Intersection Summary	Green Ext Time (p_c), s	Max Q Clear Time (g_c+l1), s	Max Green Setting (Gmax), s	Change Period (Y+Rc), s	Phs Duration (G+Y+Rc), s	Assigned Phs	Timer	Approach LUS	Approach Delay, s/veh	Approach Vol, veh/h	LnGrp LOS	LnGrp Delay(d),s/veh	%ile BackOfQ(50%),veh/ln	Initial Q Delay(d3),s/veh	Incr Delay (d2), s/veh	Uniform Delay (d), s/veh	Upstream Filter(I)	HCM Platoon Ratio	Avail Cap(c_a), veh/h	V/C Ratio(X)	Lane Grp Cap(c), veh/h	Prop In Lane	Cycle O Clear(o c). s	O Serve(a.s), s	Grp Volume(v), veh/h	Sat Flow, veh/h	Arrive On Green	Cap, veh/h	Percent Heavy Veh, %	Peak Hour Factor	Adj No. of Lanes	Adi Flow Rate, veh/h	Adi Sat Flow yeh/h/ln	Parking Bus Adi	Ped-Bike Adi(A phT)	Initial O (Ob) veh	Number	Future Volume (veh/h)	Traffic Volume (veh/h)	Lane Configurations	Movement		
		0.0	2.9	4.0	4.5	6.4	_	_				В	16.7	0.8	0.0	0.2	16.5	1.00	1.00	332	0.24	287	1.00	1.6	1.6	1700	1792	0.05	287	_	0.95	_	68	1881	100	1.00	o .	7	65	65	Ħ	EBL	-	
		1.5	5.5	17.5	4.5	24.1	2	2	C	22.0	342		0.0	0.0	0.0	0.0	0.0	0.00	1.00	0	0.00	0	1	0.0	0.0	0	1467	0.21	310	_	0.95	_	227	1881	18		ο.	4	210	210	₽÷	EBT	ţ	
19.0 B		0.0	5.4	4.5	4.5	9.0	ω	ω				0	23.3	4.2	0.0	2.9	20.4	1.00	1.00	522	0.71	385	0.19	7.8	7.8	1810	352	0.21	74	_	0.95	0	53	1900	100	1.00	o :	14	50	50		EBR	4	
		2.0	9.8	16.0	4.5	16.3	4	4				В	16.1	1.7	0.0	0.3	15.8	1.00	1.00	353	0.40	353	1.00	3.4	3.4	1702	1792	0.08	353	_	0.95	_	142	1881	1 00	1.00	0 (ω	135	135	Ħ	WBL	4	
		0.0	4.8	4.1	4.5	8.6	57	5	C	22.2	489		0.0	0.0	0.0	0.0	0.0	0.00	1.00	0	0.00	0		0.0	0.0	0	1718	0.25	421	_	0.95	_	321	1881	100		0 (00	305	305	₽÷	WBT	†	
		1.5	6.4	17.4	4.5	21.9	6	6				C	24.6	5.6	0.0	5.1	19.5	1.00	1.00	549	0.76	456	0.07	9.7	9.7	1857	139	0.25	34	_	0.95	0	26	1900	1 00	1 3	0 1	18	25	25		WBR	1	
		0.0	3.6	4.0	4.5	7.1	7	7				В	11.7	1.4	0.0	0.1	11.6	1.00	1.00	543	0.25	543	1.00	2.8	2.8	1702	1792	0.07	543	_	0.95	_	137	1881	100	1.00	0 (5	130	130	Ħ	NBL	۶	
		1.6	11.7	16.5	4.5	18.2	00	∞	σ.	12.9	295		0.0	0.0	0.0	0.0	0.0	0.00	1.00	0	0.00	0		0.0	0.0	0	1256	0.35	441	_	0.95		111	1881	18	,	0 1	2	105	105	₯	NBT	→	
												В	13.9	1.9	0.0	1.0	12.9	1.00	1.00	627	0.25	627	0.30	ω c	ب ا ا	1787	532	0.35	187	_	0.95	0	47	1900	100	1.00	o i	12	115	115		NBR	•	
												В	12.3	0.4	0.0	0.0	12.2	1.00	1.00	613	0.08	546	1.00	0.9	0.9	1702	1792	0.03	546	_	0.95	_	42	1881	100	1.00	ο.	_	40	40	Ħ	SBL	•	
									σ.	15.6	221		0.0	0.0	0.0	0.0	0.0	0.00	1.00	0	0.00	0		0.0	000	0 0	922	0.31	288	_	0.95	_ ;	9 :	1881	18		0	6	90 ;	%	₽→	SBT	+	
												В	16.4	2.3	0.0	1.6	14.7	1.00	1.00	542	0.33	542	0.47	4.4	4.4	179	815	0.31	254	_	0.95	0	84	1900	100	1.00	0 1	16	80	80		SBR	4	

Tumwater Transportation Master Plan SCJ Alliance

SITE LAYOUT

W Site: 47) Littlerock Rd at Tumwater Blvd

Projected 2022 without improvements PM Peak Hour



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Organisation: SCJ.ALLANCE | Cestaed: Monday, Febnary 29. 2016 1:193-09 Pty
Project: N:Projects/0625 City of Turnwater/0625.17 Turnwater Transportation Master Plan/Traffic/Operations/sidra/2022 Baseline/Existing 2022 PM. sp6

MOVEMENT SUMMARY

Site: 47) Littlerock Rd at Tumwater Blvd

Projected 2022 without improvements PM Peak Hour Roundabout

Movem	Movement Performance - Vehicles	ance - Vel	nicles								
Mov	OD	Demand Flows	Flows	Deg.	Average	Level of	95% Back of Queue	Queue	Prop.	Effective	Average
₽					Delay				Queued	Stop Rate	Speed
										per veh	mph
SouthEa	SouthEast: RoadName										
3x	2	314	1.0	0.282	10.7	LOSB	1.5	38.9	0.40	0.66	34.0
18x	R2	340	1.0	0.299	5.1	LOS A	1.7	42.1	0.40	0.55	35.6
Approach	ד	654	1.0	0.299	7.8	LOS A	1.7	42.1	0.40	0.60	34.8
NorthEa	NorthEast: RoadName										
×	L2	383	1.0	0.491	11.7	LOSB	3.2	80.8	0.58	0.71	34.3
6x	T1	410	1.0	0.491	6.2	LOS A	3.2	80.8	0.54	0.63	35.4
Approach	ד	793	1.0	0.491	8.9	LOS A	3.2	80.8	0.56	0.67	34.8
SouthW	SouthWest: RoadName	Ü									
2×	T1	197	0.0	0.198	5.9	LOS A	1.1	26.5	0.52	0.55	36.0
12x	R2	181	0.0	0.190	6.0	LOS A	1.0	24.9	0.52	0.63	35.3
Approach	Ъ	378	0.0	0.198	5.9	LOS A	1.1	26.5	0.52	0.59	35.7
All Vehicles	les	1824	0.8	0.491	7.9	LOS A	3.2	80.8	0.50	0.63	35.0
l evel of s	l evel of Service (LOS) Method: Delay & v/c (HCM 2010)	Method: De	vlav & v/c	/HCM 2010)							

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 M3D).

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

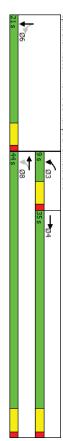
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Lanes, Volumes, Timings
48: I-5 SB Ramps & Tumwater Blvd

Projected 2022 without improvements

Control Type: Actuated-Uncoordinated	Actuated Cycle Length: 64.9	Cycle Length: 65	Area Type:	Intersection Summar	Recall Mode	Lead-Lag Optimize?	Lead/Lag	Total Lost Time (s)	Lost Time Adjust (s)	All-Red Time (s)	Yellow Time (s)	Total Split (%)	Total Split (s)	Minimum Split (s)	Minimum Initial (s)	Switch Phase	Detector Phase	Permitted Phases	Protected Phases	Turn Type	Shared Lane Traffic (%)	Heavy Vehicles (%)	Peak Hour Factor	Travel Time (s)	Link Distance (ft)	Link Speed (mph)	Right Turn on Red	Taper Length (ft)	Storage Lanes	Storage Length (ft)	Ideal Flow (vphpl)	Future Volume (vph)	Traffic Volume (vph)	Lane Configurations	Lane Group	
ed-Uncoordinate	th: 64.9		Other	у																	8	1%	0.94					25	0	0	1900	0	0		EBL	<u>,</u>
ď					None	Yes	Lag	4.5	0.0	1.0	3.5	53.8%	35.0	20.5	4.0		4		4	NA				41.9	1843	30							425	⇒	EBT	ļ
																						1%	0.94				Yes		0	0	1900	105	105		EBR	1
					None	Yes	Lead				3.5		9.0	8.5	4.0		ω	00	ω	pm+pt		1%	0.94					25	0	0	1900	365	365		WBL	1
					Max			4.5	0.0	1.0	3.5	67.7%	44.0	20.5	4.0		00		00	NA		1%	0.94	18.3	807	30					1900	310	310	2 >	WBT	†
																						1%	0.94				Yes		0	0	1900	0	0		WBR	*
																						0%	0.94					25	0	0	1900	0	0		NBL	۶
																						0%	0.94	33.1	1457	30					1900	0	0		NBT	→
																						0%	0.94				Yes		0	0	1900	0	0		NBR	•
					None				0.0					20.5	4.0		6	6		Perm	10%	4%	0.94					25	_	350	1900	400	400	Ji.	SBL	•
					None			4.5	0.0	1.0	3.5	32.3%	21.0	20.5	4.0		6		6	NA		4%	0.94	35.7	1571	30					1900	30	30	₽	SBT	←
																						4%	0.94				Yes		0	0	1900	310	310		SBR	•

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



Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

HCM 2010 Signalized Intersection Summary 48: I-5 SB Ramps & Tumwater Blvd

Projected 2022 without improvements

	-	Ļ	4	1	†	<u> </u>	٠	→	*	•	←	•
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		∌			2 ,					-31	\$ →	
Traffic Volume (veh/h)	0	425	105	365	310	0	0	0	0	400	30	310
Future Volume (veh/h)	٥ د	425	105	365	310	å 0	0	0	0	400	, 30	310
Initial Q (Ob), veh	0 ~	0 4	0 4	0 6	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
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/h/ln	0	1881	1900	1900	1881	0				1827	1827	1900
Adj Flow Rate, veh/h	0	452	112	388	330	0				306	200	154
Adj No. of Lanes	000	2 2	000	000	004	000				004	004	
Percent Heavy Veh %	0.94	0.94	0.94	0.94	0.94	0.94				0.94	0.94	0.94
Cap, veh/h	0	1759	433	88	7	0				419	231	178
Arrive On Green	0.00	0.62	0.62	0.62	0.62	0.00				0.24	0.24	0.24
Sat Flow, veh/h	0	2939	700	ω	11	0				1740	959	738
Grp Volume(v), veh/h	0	283	281	718	0	0				306	0	354
Grp Sat Flow(s),veh/h/ln	0	1787	1758	3 13	0	0				1740	0	1697
Cycle O Clear(g_s), s	0.0	4.6	4.6	28.2	0.0	0.0				10.3	0.0	12.8
Prop In Lane	0.00		0.40	0.54		0.00				1.00		0.44
Lane Grp Cap(c), veh/h	0	1105	1086	0	0	0				419	0	409
V/C Ratio(X)	0.00	0.26	0.26	0.00	0.00	0.00				0.73	0.00	0.87
HCM Platoon Ratio	100	100	100	1 80	100	1 80				100	3	100
Upstream Filter(I)	0.00	1.00	1.00	1.00	0.00	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				22.3	0.0	23.3
Incr Delay (d2), s/veh	0.0	0.1	0.1	0.0	0.0	0.0				5.5	0.0	15.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	2.2	2.2	0.0	0.0	0.0				5.6	0.0	7.8
LnGrp LOS		Α :	Α :	ç	ċ	ç				0	S	D
Approach Vol, veh/h		564			718						660	
Approach Delay, s/veh		5.7			0.0						33.8	
Approach LOS		A			A						С	
Timer	_	2	ω	4	5	6	7	∞				
Assigned Phs				4		6		8				
Phs Duration (G+Y+Rc), s				44.0		19.9		44.0				
Change Period (Y+Rc), s				4.5		4.5		4.5				
Max Green Setting (Gmax), s				30.5		16.5		39.5				
Green Ext Time (p_c), s				11.5		0.6		6.1				
Intersection Summary												
HCM 2010 Ctrl Delay			13.1									
HCM 2010 LOS			В									
Notes												

Tumwater Transportation Master Plan SCJ Alliance

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

Projected 2022 without improvements
PM Peak Hour

WBT WBR NBL 610 1205 65 610 12	EBR WBL WBT WBR NBL NBT NBR 0 0 610 1205 65 5 150 0 0 0 610 1205 65 5 150 0 0 0 0 0 0 0 0 0 Free Free Free Stop Stop Stop None - Free Free Stop Stop Stop 0 0 150 0 0 150 - 1 1 1 3 3 3 3 1 1 1 1 3 3 3 0 0 693 1369 74 6 170 Major2 Minor1 Major2 Minor1 6645 6.545 6.945
WBL WBT WBR NBL NBT NBR 0 610 1205 65 5 150 0 610 1205 65 5 150 0 0 0 0 0 0 Free Free Free Slop Slop Slop - Free - None - 0 - 150 - 0 - 0 - 150 - 0 - 0 - 150 - 0 - 100 - 101 - 111 1 3 3 3 - 111 1 1 3 3 3 - 111 1 1 1 3 3 3 - 111 1 1 1 3 3 3 - 111 1 1 1 3 3 3 - 111 1 1 1 3 3 3 - 111 1 1 1 3 3 3 - 111 1 1 1 3 3 3 - 111 1 1 1 3 3 3 - 111 1 1 1 3 3 3 - 111 1 1 1 3 3 3 - 111 1 1 1 3 3 3 - 111 1 1 1 3 3 3 - 111 1 1 1 3 3 3 - 111 1 3 3 3 - 111 1 1 1 3 3 - 111 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	WBL WBT WBR NBL NBT NBR SBI SBI 0 610 1205 65 5 150 0
WBT WBR NBL NBT NBR 610 1205 65 5 150 610 1205 65 5 150 610 1205 65 5 150 0 0 0 0 Free Free Slop Slop Slop - Free - None - 0 - 150 0 - 0 - 0 0 - 0 - 0 0 - 0 - 150 0 0 - 0 0 - 105 0 1852 1852 358 1 15 1159 - 1645 6345 6945 - 645 5.545 - 5.845 5.545 - 0 5.845 5.545 - 5.845 5.545 - 0 5.845 5.545 - 13528 3385 - 0 7.7 73 633 - 0 5.285 4.0285 3.385 - 0 7.7 73 633 - 0 5.285 4.0285 3.385 - 0 7.7 73 633	WBT WBR NBL NBT NBR SBL SBT 610 1205 65 5 150 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
WBR NBL NBT NBR 1205 65 5 150 1205 65 5 150 0 0 0 0 Free Stop Stop Stop Free - 150 0 - 150 0 - 150 0 - 150 0 - 150 0 - 150 0 - 150 0 - 150 0 - 150 0 - 1852 1852 358 1 3 3 3 1369 74 6 170 Minor1 0 1852 1852 358 - 1159 1159 - 6045 6545 6945 - 6445 5.545 6945 - 5.445 5.545 - 5.445 5.545 - 5.445 5.545 - 5.445 5.545 - 5.445 5.545 - 5.445 5.545 - 5.445 5.545 - 5.445 5.545 - 5.445 5.545 - 5.445 5.545 - 5.445 5.545 - 5.45 5.545 - 5.445 5.545 - 5.45 5.545 - 5.445 5.545 - 5.45 5.545 - 5.45 5.545 - 7.2 73 637	WBR NBL NBT NBR SBL SBT 1205 65 5 150 0 0 0 1205 65 5 150 0 0 0 0 1205 65 5 150 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
NBL NBT NBR 65 5 150 65 5 150 0 0 0 Slop Slop Slop - None - 150 - 0 - 88 88 88 88 88 88 88 3 3 3 74 6 170 Minor1 Miss 1159 693 693 6.645 6.545 5.845 5.545 - 72 73 637	NBL NBT NBR SBL SBT 65 5 150 0 0 65 5 150 0 0 0 0 0 0 0 Slop Slop Slop Slop Slop - None - 150 0 - 0 0 0 - 0 0 0 88 88 88 88 88 88 88 88 88 88 88 88 8
	SBL SBT 0 0 0 Slop Slop 0 88 88 88 0 0 0 0 0 0
	SBL SBT 0 0 0 0 0 0 Stop Stop Stop 0 0 0 0 0 0 0 0 0 0
	SBL SBT 0 0 0 Slop Slop Slop 0 0 0 0 0 0 0
Siop 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	SBT 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

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

Projected 2022 without improvements

PM Peak Hour

The part of the

Natural Cycle: 85 Control Type: Actuated-Uncoordinated	Actuated Cycle Length: 71.8	Victe Type:	itersection Summary	Recall Mode	_ead-Lag Optimize :	Lead/Lag	otal Lost Time (s)	ost Time Adjust (s)	All-Red Time (s)	rellow Time (s)	otal Split (%)	otal Split (s)	//dinimum Split (s)	Ainimum Initial (s)	Switch Phase	etector Phase	ermitted Phases	rotected Phases	urn Type	Shared Lane Traffic (%	Heavy Vehides (%)	eak Hour Factor	ravel Time (s)	ink Distance (ft)	ink Speed (mph)	Right Turn on Red	aper Length (ft)	Storage Lanes	Storage Length (ft)	deal Flow (vphpl)	Future Volume (vph)	Traffic Volume (vph)	ane Configurations	ane Group	
I-Uncoordinated	: 71.8	Other		None	Yes	Lead	5.0	0.0	1.0	4.0	12.9%	11.0	11.0	6.0		ω		ω	Prot	_	2%	0.94					25	2	300	1900	130	130	14.14	EBL	<u>,</u>
				Max	Yes.	Lag	5.0	0.0	1.0	4.0	36.5%	31.0	31.0	6.0		00		00	NA		2%	0.94	20.3	895	30					1900	595	595	4	EBT	ļ
																					2%	0.94				Yes		0	0	1900	150	150		EBR	1
				None	Yes	Lead	5.0	0.0	1.0	4.0	12.9%	11.0	11.0	6.0		7		7	Prot		1%	0.94					25	_	350	1900	105	105	s	WBL	1
				Max	Yes	Lag	5.0	0.0	1.0	4.0	36.5%	31.0	31.0	6.0		4		4	NA		1%	0.94	29.0	1275	30					1900	755	755	*	WBT	†
				Max	Yes	Lag	5.0	0.0	1.0	4.0	36.5%	31.0	31.0	6.0		4	4		Perm		1%	0.94				Yes		_	250	1900	30	30	74	WBR	~
				None	Yes	Lead	5.0	0.0	1.0	4.0	14.1%	12.0	11.0	6.0		_		_	Prot		1%	0.94					25	_	250	1900	170	170	s	NBL	۶
				None	Yes	Lag	5.0	0.0	1.0	4.0	36.5%	31.0	31.0	6.0		6		6	NA		1%	0.94	23.3	1023	30					1900	105	105	*	NBT	→
				None	Yes	Lag	5.0	0.0	1.0	4.0	36.5%	31.0	31.0	6.0		6	6		Perm		1%	0.94				Yes		_	150	1900	55	55	-14	NBR	•
				None	Yes	Lead	5.0	0.0	1.0	4.0	14.1%	12.0	11.0	6.0		5		5	Prot		1%	0.94					25	_	300	1900	185	185	s	SBL	•
				None	Yes	Lag	5.0	0.0	1.0	4.0	36.5%	31.0	31.0	6.0		2		2	NA		1%	0.94	47.1	2073	30					1900	185	1 85.	*	SBT	←
																	Free		Free		1%	0.94				Yes		_	700	1900	875	875	-1	SBR	4

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50: Center St/Linderson Way & Tumwater Blvd

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

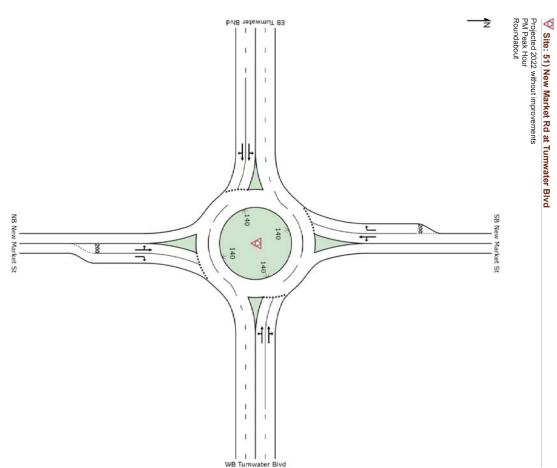
Projected 2022 without improvements

	۰					٠		٠		-	-	-
	1	ţ	1	1	†	1	۶	→	*	•	+	*
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	#	4		_#	*	74	J	*	74	_#	→	-4
Traffic Volume (veh/h)	130	595	150	105	755	30	170	105	55	185	185	875
Future Volume (veh/h)	130	595	150	105	755	30	170	105	55	185	185	875
Number	ω	00	18	7	4	14	_	6	16	57	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1881	1881	1881	1881	1881	1881	1881	1881	1881
Adj Flow Rate, veh/h	138	633	160	112	803	32	181	112	59	197	197	0
Adj No. of Lanes	2	2	0	_	2	_	_	_	_	_	_	_
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, %	2	2	2	_	_	_	_	_	_	_	_	_
Cap, veh/h	277	1055	266	143	1343	601	181	289	245	181	289	245
ireen	0.08	0.38	0.38	0.08	0.38	0.38	0.10	0.15	0.15	0.10	0.15	0.00
	3442	2801	707	1792	3574	1599	1792	1881	1599	1792	1881	1599
veh/h	138	400	393	112	803	32	181	112	59	197	197	0
۷ln	1721	1770	1738	1792	1787	1599	1792	1881	1599	1792	1881	1599
	2.7	12.6	12.6	4.2	12.5	0.9	7.0	3.7	2.2	7.0	6.9	0.0
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	0.0
Prop In Lane	1.00		0.41	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	245
V/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	0.00
Avail Cap(c_a), veh/h	298	666	654	155	1343	601	181	707	601	181	707	601
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)	30.00	17.00	17.00	31.00	17.00	13.00	31.00	2.00	2.00	31.0	37.7	0.00
Incr Delay (d2) s(yeh	1 /	4.4	11.4	21.0	20	0.0	66.5	20.4	0.5	03.1	2 8 6	0.0
Initial O Delay(d3) stych	00 -	0.0	00 -	0.0	0.0	0.0	0.0	0.0	000	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	<u>۔</u> ن	6.8	6.7	2.9	6.5	0.4	6.8	2.0	1.0		ω	0.0
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	0.0
LnGrp LOS	С	С	С	D	В	В	F	С	С	F	С	
Approach Vol, veh/h		931			947			352			394	
Approach Delay, s/veh		22.9			23.1			63.2			76.8	
Approach LOS		C			С			Е			ш	
Timer		2	ω	4	5	6	7	00				
Assigned Phs	_	2	ω	4	5	6	7	∞				
Phs Duration (G+Y+Rc), s	12.0	15.6	10.6	31.0	12.0	15.6	10.5	31.1				
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	7.0	26.0	6.0	26.0	7.0	26.0	6.0	26.0				
Max Q Clear Time (g_c+l1), s	9.0	8.9	4.7	14.5	9.0	5.7	6.2	14.6				
Green Ext Time (p_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									

Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

SITE LAYOUT



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MOVEMENT SUMMARY

W Site: 51) New Market Rd at Tumwater Blvd

Projected 2022 without improvements PM Peak Hour Roundabout

Movem	ent Perfor	Movement Performance - Vehicles	hicles								
ΞMογ	Mov	Demand Flows Total HV veh/h %	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back o Vehides veh	f Queue Distance ft		Prop. Queued	Prop. Effective Queued Stop Rate per veh
South: N	South: NB New Market St	et St									
ω	L2	22	0.0	0.043	13.5	LOS B	0.2	4.1		0.60	0.60 0.78
00	1	ъ	0.0	0.043	6.4	LOSA	0.2	4.1		0.60	0.60 0.78
18	R2	65	0.0	0.073	5.8	LOSA	0.3	7.6		0.58	0.58 0.67
Approach	_	92	0.0	0.073	7.6	LOSA	0.3	7.6	0,	0.59	
East: WE	East: WB Tumwater Blvd	Blvd									
_	72	65	2.0	0.316	10.7	LOS B	2.1	52.3	ω	3 0.28	
6	1	815	2.0	0.316	3.5	LOSA	2.1	52.9	9	9 0.27	
16	R2	27	2.0	0.316	3.9	LOSA	2.1	52.9	9	.9 0.26	
Approach	,	908	2.0	0.316	4.1	LOSA	2.1	5	52.9	2.9 0.27	
North: SI	North: SB New Market St	et St									
7	72	60	4.0	0.118	13.4	LOS B	0.4	⇉	11.4	.4 0.58	
4	1	22	4.0	0.118	6.3	LOSA	0.4	11.4	4	.4 0.58	
14	R2	147	4.0	0.163	5.9	LOSA	0.7	17.0	.0	.0 0.57	
Approach	,	228	4.0	0.163	7.9	LOSA	0.7	<u> </u>	17.0	7.0 0.57	
West EE	West EB Tumwater Blvd	Blvd									
σı	72	49	4.0	0.360	11.2	LOS B	2.4	6	62.6	2.6 0.41	
2	1	875	4.0	0.360	4.0	LOSA	2.5	63.9	9.9	8.9 0.40	
12	R2	27	4.0	0.360	4.4	LOSA	2.5	63.9	.0	.9 0.39	
Approach	5	951	4.0	0.360	4.4	LOSA	2.5	63.9	.9	.9 0.40	
All Vehicles	les	2179	3.0	0.360	4.7	LOSA	2.5	63.9	9	9 0.37	

Level of Service (LOS) Method: Delay & vic (HOM 2010).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay and vic ratio (degree of saturation) per movement

LOS F will result if vic > 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 (vic not used as specified in HOM 2010).

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay. Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

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

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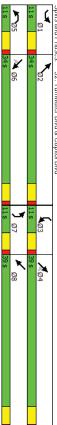
Lanes, Volumes, Timings
52: Tumwater Blvd & Capitol Blvd

Projected 2022 without improvements PM Peak Hour

	Ĺ	×	*	7	×	~	अ	×	1	~	×	₹
Lane Group	SEL	SET	SER	NWL	TWN	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations	_#	→	٦,	<i>3</i>	⇒		J1	→	74	J	≯	
Traffic Volume (vph)	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
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
Storage Lanes	_		_	2		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)		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	0.90	0.90
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	
Protected Phases	_	6		5	2		7	4		ω	00	
Permitted Phases			6						4			
Detector Phase	_	6	6	5	2		7	4	4	ω	00	
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 Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	Max	Max	None	Max		None	None	None	None	None	
Intersection Summary												
Area Type:	Other											
2												

Cycle Length: 95
Actuated Cycle Length: 83.7
Natural Cycle: 95
Control Type: Actuated-Uncoordinated

Splits and Phases: 52: Tumwater Blvd & Capitol Blvd



SCJ Alliance Tumwater Transportation Master Plan

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

Projected 2022 without improvements
PM Peak Hour

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Movement	SEL	SET	SER	NWL	TWN	NWR	NEL	NET	NER	SWL	TWS	SWR
Lane Configurations	Ħ	*	74	-# -#	44		Ħ	*	74	JI.	44	
Traffic Volume (veh/h)	120	475	175	200	305	20	90	325	245	85	340	15
Future Volume (veh/h)	120	475	175	200	305	20	90	325	245	89	340	35
Number	_	6	16	5	2	12	7	4	14	ω	00	78
Initial Q (Qb), veh	30	0	3 0	8 0	0	20	200	0	0	3 0	0	3 0
Ped-Bike Adj(A_pb1)	1.00	200	1.00	1.00		1.00	1.00	8	1.00	1.00		1.00
Parking Bus, Adj Adi Sat Flow veh/h/In	1.00	1845	1845	1.00	1.00	1000	1.00	1.00	1.00	1881	1881	1.00
Adi Flow Rate, veh/h	133	528	116	222	339	22	100	361	ω : ω :	94	378	17
Adj No. of Lanes	_	_	_	2	2	0	_	_	_	_	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, %	ω	ω	ω	_	_	_	_	_	_	_	_	_
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
Grp Volume(v), veh/h	133	528	116	222	177	184	100	361	33	94	193	202
Grp Sat Flow(s),veh/h/ln	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	<u>1</u> .ω	4.2	7.4	7.4
Prop In Lane	1.00		1.00	1.00		0.12	1.00		1.00	1.00		0.08
Lane Grp Cap(c), veh/h	130	658	559	257	638	657	128	482	410	120	451	467
V/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
HCM Platoon Ratio	100	100	1 00	100	100	100	100	100	100	100	100	1 2
Upstream Filter(I)	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	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 (d2), s/veh	86.0	10.0	0.8	25.1	=	1	22.9	2.4	0.1	20.7	0.6	0.6
Initial Q Delay(d3),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 BackOfQ(50%),veh/ln	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),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	В	т	В	В	m	C	C	Е	C	0
Approach Vol, veh/h		777			583			494			489	
Approach Delay, s/veh		46.8			36.0			35.7			32.3	
Approach LOS		D			D			D			С	
Timer	_	2	ω	4	5	6	7	∞				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	11.0	34.0	10.5	25.8	11.0	34.0	10.8	25.5				
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 (g_c+l1), s	8.0	7.8	6.2	16.4	7.1	23.0	6.5	9.4				
Green Ext Time (p_c), s	0.0	6.5	0.0	4.5	0.0	Ç.	0.0	5.0				
Intersection Summary												
HCM 2010 Ctrl Delay			38.8									
HCM 2010 LOS			C									

Tunwaler Transportation Master Plan
Synchro 9 Report
SCJ Alliance
6/10/2016

Lanes, Volumes, Timings
53: 65th Ave & Henderson Blvd

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Projected 2022 without improvements
PM Peak Hour

			•	•					•		•	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	_#	₹		J,	₩			\$ →			\$	
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	57	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
Storage Lanes	_		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	0.91	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 (%)												
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			000			4		
Detector Phase	2	2		6	6		00	00		4	4	
Minimum Initial (s)	80	80		80	ж О		ж О	80		80	20	
Minimum Split (s)	27.5	27.5		27.5	27.5		12.5	12.5		27.5	27.5	
Total Split (s)	52.5	52.5		52.5	52.5			27.5			27.5	
Total Split (%)	65.6%	65.6%		65.6%	65.6%			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	
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												
Recall Mode	Max	Max		Max	Max		None	None		None	None	
Intersection Summary												
Area Type:	Other											
Cycle Length: 80												
Actuated Cycle Length: 71.9	.9											
Captral Type: Actuated III	and instead											
Collinate 1 3 pc. Actuation of Economication	COOLCHICK											

2.5s

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

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Tumwater Transportation Master Plan SCJ Alliance

HCM 2010 Signalized Intersection Summary 53: 65th Ave & Henderson Blvd

Projected 2022 without improvements
PM Peak Hour

File EBI EBI WBI WBI WBI NBI NBI NBI NBI SBI		*	,	1		t	~	*	*	*		-	L
1	Mayament	B '	E .	FRR 4	₩RI ◀	WRT	WRR	NR -	NRT -	NR ~	£ ,	SRT 4	SBB
9) 5 870 70 80 565 5 35 0 55 5 0 0) 5 870 70 80 565 5 35 0 55 5 0 1,00	Lane Configurations		₽→	100		₽→		i i	\$→	i	0	\$	0
b) 5 870 70 80 565 5 35 0 55 5 0 10 5 5 7 0 10 10 10 100 100 100 100 100 100 10	Traffic Volume (veh/h)	5	870	70	80.	565	5	35	0	55	5	0	2
S	Future Volume (veh/h)	ഗ	870	70	80	565	ъ	35	0	55	σı	0	2
1,00	Number	5	2	12	_	6	16	ω	00	18	7	4	14
1.00	nitial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00	Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
1881 1881 1900 1881 1881 1900 1900 1900	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
1 1 1 0 1 0 1 0 1 0 1 1 0 1 1 0 1 1 0 1 1 0 1 1 0 1 1 0 1 1 0 1 1 0 1 1 0 1 1 0 1 1 0 1 1 0 1 1 0 1 1 0 1 1 0 1 1 0 1 1 0 1 1 0 0 1 0 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 1 0 1 1 0 1 0 1 0 1 0 1 0 1 1 1 0 1 1 1 0 1 1 1 0 1 1 1 0 1 1 1 0 1 1 1 0 1	Adj Sat Flow, veh/h/ln	1881	1881	1900	1881	1881	1900	1900	1900	1900	1900	1900	1900
0.91 0.91 0.91 0.91 0.91 0.91 0.91 0.91	AdJ Flow Rate, ven/h	ۍ د	956	, =	000	621		38	, C	60	o 0	٥ ،	2
8 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0		0 _	001	001	001	001	001	001	01 _	001	0 0	001	001
619 1294 104 356 1403 11 128 15 102 205 16 804 1718 178 50.75 0.75 0.75 0.75 0.75 0.75 0.75 0.7	ት,%	:						0	0	0	0	0	0
0.75 0.75 0.75 0.75 0.75 0.75 0.71 0.00 0.11 0.11 0.00	Cap, veh/h	619	1294	104	356	1403	⇉	128	15	102	205	16	50
804 1718 138 549 1864 15 469 143 966 1026 151 101n 840 1718 138 549 1864 15 469 143 966 1026 151 101n 840 1013 88 0 0 0 7 0 0 0 101 101 101 101 101 101 1	Arrive On Green	0.75	0.75	0.75	0.75	0.75	0.75	0.11	0.00	0.11	0.11	0.00	0.11
S	Sat Flow, veh/h	804	1718	138	549	1864	15	469	143	966	1026	151	471
viln 804 0 1857 549 0 1879 1579 0 0 1647 0 0.1 0.1 0.0 198 6.8 00 7.9 2.2 0.0	Grp Volume(v), veh/h	5	0	1033	88	0	626	98	0	0	7	0	0
8.0 1 0.0 19.8 6.8 0.0 7.9 2.2 0.0 0.0 0.0 0.0 1.00 1.00 1.00 1.00	Grp Sat Flow(s),veh/h/ln	804	0	1857	549	0	1879	1579	0	0	1647	0	0
80 00 198 26.5 00 7.9 3.7 00 00 02 00 100 100 100 100 00 7.4 00 00 100 00 100 100 100 100 100 100 1	2 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
hh 6190 0007 1000 0001 0039 0061 077 100 0001 0009 0074 025 0000 0.44 0.40 0.00 0.003 0.000 0.74 0.25 0.00 0.44 0.40 0.00 0.00 0.03 0.000 1.000	Cycle Q Clear(g_c), s	0.8	0.0	19.8	26.5	0.0	7.9	3.7	0.0	0.0	0.2	0.0	0.0
10.01 0.00 0.74 0.25 0.00 0.44 0.40 0.00 0.00 0.03 0.00 0.03 0.00 0.03 0.00 0.03 0.00 0.03 0.00 0.03 0.00 0.03 0.00	ane Gm Can(c) veh/h	610	>	1308	356	0	10.01	246	0	0.01	271	>	0.29
Here (A19 0 1398 356 0 1414 638 0 0 635 0 1100 1100 1100 1100 1100 1100 1100	V/C Ratio(X)	0.01	0.00	0.74	0.25	0.00	0.44	0.40	0.00	0.00	0.03	0.00	0.00
1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00	Avail Cap(c_a), veh/h	619	0	1398	356	0	1414	638	0	0	635	0	0
1.00 0.00 1.00 1.00 0.00 1.00 0.00 1.00 0.00 1.00 0.00 1.00 0.00 1.00 0.00 1.00 0.00 1.00 0.00 1.00 0.00 1.00 0.00 1.00 0.00 1.00 0.00 1.00 0.00 1.00 0.00 1.00 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
Hein 4.4 0.0 3.4 11.8 0.0 2.9 27.1 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	Jpstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
eth 0.0 0.0 3.3 1.0 0.0 1.1 1.3 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	Uniform Delay (d), siven	4.4	0.0	3.4	1.8	0.0	2.9	27.1	0.0	0.0	25.6	0.0	0.0
nehlin 0.0 0.0 11.1 1.2 0.0 4.4 1.7 0.0 0.0 0.1 0.0 A 4.4 0.0 7.9 13.4 0.0 3.9 28.4 0.0 0.0 25.6 0.0 A A B A C 98 7 7 A 7.9 5.1 28.4 25.6 28.4 25.6 A A B A C C C C A B C C C C C A B A C C C C C A B A C C C C C A B A C C C C C A B A C C C C C A B A B C C C C C C A B A C C C C C C A B A B A B A A A A A A A A	nitial 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
4.4 0.0 7.9 13.4 0.0 3.9 28.4 0.0 0.0 25.6 0.0 A A B A C 98 7 7 A P 51 28.4 25.6 25.7 25.6 25.7 25.6 25.7 25.6 25.7 25.6 25.7 25.6 25.7 25.6 25.7 25.6 25.7 25.6 25.7 25.6 25.7 25.6	%ile BackOfQ(50%),veh/ln	0.0	0.0	11.1	1.2	0.0	4.4	1.7	0.0	0.0	0.1	0.0	0.0
A A B A C 98 1038 714 98 h 7.9 5.1 28.4 A A A A C 8.0 1 2 3 4 5 6 7 8 2 2 4 6 8 (c), s 52.5 11.3 52.5 11.3 max), s 48.5 23.0 48.0 23.0 (c+11), s 21.8 2.2 28.5 5.7 (s 8.0	_nGrp 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
h 7.9 5.1 28.4 h 7.9 5.1 28.4 C A C C 1 2 3 4 5 6 7 8 10.), S 52.5 11.3 52.5 11.3 D), S 4.5 4.5 4.5 4.5 C+H), S 218 22 28.5 5.7 S 18.7 0.6 14.8 0.5	_nGrp LOS	Þ		Þ	В		Þ	C			C		
h 7.9 5.1 28.4 A A C A C B C C C C C C C C C C C C C C C C C C	Approach Vol, veh/h		1038			714			98			7	
A A C 1 2 3 4 5 6 7 8 2 4 6 8 3), s 52.5 11.3 52.5 11.3 5), s 4.5 4.5 4.5 4.5 6, s 18.7 0.6 14.8 0.5 8.0 A C C A D C C C C C C C C C C C C C C C C C C	Approach Delay, s/veh		7.9			5.1			28.4			25.6	
1 2 3 4 5 6 7 2 4 6 5), s 52.5 11.3 52.5 5), s 4.5 4.5 4.5 6, s 18.7 0.6 14.8	Approach LOS		A			Α			C			С	
(c), s 52.5 11.3 52.5 (d), s 52.5 11.3 52.5 (d), s 4.5 4.5 4.5 (max), s 48.0 23.0 48.0 (c+11), s 21.8 2.2 28.5 (s), s 18.7 0.6 14.8	Timer	_	2	ယ	4	5	6	7	00				
(c), s 52.5 11.3 52.5 (max), s 4.5 4.5 4.5 (max), s 48.0 23.0 48.0 (c+11), s 21.8 2.2 28.5 (s 18.7 0.6 14.8	Assigned Phs		2		4		6		∞				
(a), S	Phs Duration (G+Y+Rc), s		52.5		11.3		52.5		11.3				
imax), s 48.0 23.0 48.0 _c+II), s 21.8 2.2 28.5 , s 18.7 0.6 14.8	Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
_c+I)), s	Max Green Setting (Gmax), s		48.0		23.0		48.0		23.0				
18.7 0.6 14.8 1 80	Max Q Clear Time (g_c+l1), 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 Ctrl Delay			8.0									

Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

Lanes, Volumes, Timings
54: Henderson Blvd & Tumwater Blvd

Projected 2022 without improvements

Area Type: Other Cycle Length: 90 Actualed Cycle Length: 90 Natural Cycle: 90 Control Type: Actuated-Uncoordinated Lane Group Lane Configurations Traffic Volume (vph) Future Volume (vph) Ideal Flow (vphp) Storage Length (ft) Storage Length (ft) Storage Length (ft) Storage Length (ft) Future Volume (mph) Link Speed (mph) Link Distance (ft) Travel Time (s) Peak Hour Factor Heavy Vehicles (%) Shared Lane Traffic (%) Turn Type Protected Phases Detector Phases Detector Phase Switch Phase Minimum Initial (s) Minimum Spill (s) Total Spill (%) Total Spill (%) Yellow Time (s) All-Red Time (s) Lost Time Adjust (s) Total Lost Time (s) Lead/Lag Lead-Lag Optimize? Recall Mode Splits and Phases: 54: Henderson Blvd & Tumwater Blvd 6.0 20.5 44.0 48.9% 3.0 1.0 0.0 35 3122 60.8 0.91 1% Max Prot 2 685 685 1900 0 1 0.91 30 30 1900 0 EBR Yes 6.0 10.5 16.0 17.8% 3.0 1.0 None 0.91 25 25 1900 0 0 25 Split 8 6.0 10.5 16.0 17.8% 3.0 1.0 0.0 4.0 None 35 2394 46.6 0.91 1% 170 170 1900 8 N 30.0 30.0 30.0 33.3% 3.0 1.0 0.0 35 2111 41.1 0.91 1% Max 215 215 1900 4 NA pm+ov 2 44.0 48.9% 3.0 10.0 4.0 0.91 Max 355 355 355 1900 100 Yes

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Tumwater Transportation Master Plan SCJ Alliance

HCM 2010 Signalized Intersection Summary 54: Henderson Blvd & Tumwater Blvd

Projected 2022 without improvements
PM Peak Hour

8 NBL 30 25 30 25 12 3 12 3 10 0 1.00 1.00 1.00 1.00 1.00 1.00 1.00	NBT 170 170 170 170 170 1881 1881 187 187 1	SBT 215 215 215 216 0 1.00 1.881 1 0.01	SBR 355 355 355 114 0 1.00 1.00 1.00 1.00 1.00 1.00 1.0				
	170 170 170 170 8 0 0 1.00 1881 187 1 187	215 215 215 4 4 0 1.00 1881 236 1	355 355 355 14 0 1.00 1.00 1.00 1.00 1.00 1.00				
	170 170 8 0 1.00 1.81 187 187 1 0 0 1	215 215 215 4 4 0 0 1.00 1881 236 1	355 355 14 0 1.00 1.00 1.00 1881 269 1				
	170 8 0 1.00 1881 187 1	215 4 0 1.00 1881 236 1	355 14 0 1.00 1.00 1.81 269 1				
	1.00 1881 187 1 187	1.00 1881 236 1	14 0 1.00 1.00 1881 269 1				
	0 1.00 1881 187 1	1.00 1881 236 1	0 1.00 1.00 1881 269 1				
	1.00 1881 187 1	1.00 1881 236 1	1.00 1.00 1881 269 1				
	1881 187 187 0 91	1881 236 1	1881 269 1				
	187 1	236 1	269 1				
0	0 01	0 01	0 01				
	0 91	0 91	001				
	0.7	0.7	0.71				
	_	_	_				
	218	543	1173				
	0.13	0.29	0.29				
75 236	1634	1881	1599				
	0	236	269				
		001	100				
	0.0	9.2	4.9				
			1.00				
	0	543	1173				
	0.00	0.43	0.23				
	1.00	1.00	1.00				
	0.00	1.00	1.00				
	0.0	26.0	3.8				
	0.0	2.5	0.5				
	0.0	0.0	0.0				
	0.0	5.2					
	0.0	0.02	۸ د د				
	214	505	:				
	63.1	15.6					
	ш	В					
3	4	57	6	7	∞		
2	4				∞		
44.0	30.0				16.0		
4.0	4.0				4.0		
40.0	26.0				12.0		
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5							
D							
0.33 0.44 75 0.00 0.		1 0.13 1 236 1 294 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.	1 1 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3	1 1 1 1 1 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1 1 1 3 1 1 3 1 1 1 3 1 1 1 1 1 3 1 1 1 1 3 1 1 1 1 3 1 1 1 1 1 3 1	1 1 1 1 1 1 1 1 1 1 3 1 1 3 1 1 1 3 1 1 1 1 1 3 1 1 1 1 3 1 1 1 1 3 1

Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

HCM 2010 TWSC 55: Henderson Blvd & Trails End Dr

Projected 2022 without improvements
PM Peak Hour

Minor Lane/Major Mymt Capacity (veh/h) HCM Lane V/C Ratio	™	rol Delay, s e/Major Mvmt	rol Delay, s e/Maior Mvmt	rol Delay, s	rol Delay, s						,	ēr	d, %	Stage 2		uver		Critical Hdwy Stg 2					low All	Major/Minor Mir	Mvmt Flow	Heavy Vehicles, %	Peak Hour Factor	Grade, %	Veh in Median Storage, #	Storage Length	zed		#/hr		Traffic Vol, veh/h	Movement N	Int Delay, s/yeh 4.3
NET NERI				15 C	15 C	15	WW		564	805	361	361		644	805	412	3.5	5.4	5.4	6.4	454	239	693	mor1	69	0	87	0	0	0		Stop	0	60	60	NWL	
		7		NERNWLn1								805				805	3.3			6.2			239		63	0	87				None	Stop	0	55	55	NWR	
1274 0.113	1274	107/	ı	SWL SWT																																	
				VT			0	NE															0	Major1	184	_	87	0	0			Free	0	160	160	NET	
																							0		109	_	87				None	Free	0	95	95	NER	
							3.8	SW				1274				1274	2.209			4.11			293	Major2	144	_	87					Free	0	125	125	SWL	
																							0		167	_	87	0	0		None	Free	0	145	145	SWT	

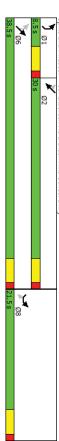
Tumwater Transportation Master Plan SCJ Alliance

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

Projected 2022 without improvements PM Peak Hour

4.5 Lag Yes None	4.5 Lag Yes None	4.5 Max	4.5 Lead Yes None	None	\supseteq	Total Lost Time (s) Lead/Lag Lead-Lag Optimize? Recall Mode Intersection Summary Area Type: Cycle Length: 60 Actuated Cycle Length: 53.7 Natural Cycle: 60
7.0 27.5 30.0 50.0% 1.0 0.0	7.0 27.5 30.0 50.0% 1.0 0.0	7.0 24.5 38.5 64.2% 3.5 1.0	4.0 8.5 8.5 14.2% 3.5 1.0	7.0 21.5 21.5 21.5 35.8% 3.5 1.0	7.0 21.5 21.5 35.8% 3.5 0.0	Switch Phase Minimum Initial (s) Minimum Spiti (s) Total Spiti (s) Total Spiti (s) Yellow Time (s) All-Red Time (s) Lost Time Adjust (s)
0.95 1% Perm	3970 90.2 0.95 1% NA	1067 24.3 0.95 1% NA	0.95 1% pm+pt 1 6	0.95 0% Perm	1065 24.2 0.95 0% Prot 8	Link Distance (ft) Travel Time (s) Peak Hour Factor Heavy Vehicles (%) Shared Lane Traffic (%) Turn Type Protected Phases Permitted Phases
SWR 555 555 1900 350 1 Yes	SWT 450 1900 1900 30	NET NET 205 205 205 205 205 205 205 205 205 205	NEL NEL 10 10 11900 1175 1 25	SER 1900 1900 1900 1900 1900 1900 1900 190	SEL 5 5 5 1900 200 1 1 25	Lane Group Lane Configurations Traffic Volume (vph) Future Volume (vph) Ideal Flow (vphpa)) Storage Length (fl) Storage Length (fl) Storage Length (fl) Right Turn on Red Link Speed (mph)

Splits and Phases: 56: Littlerock Rd & Black Hills School Drwy



Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

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

Projected 2022 without improvements
PM Peak Hour

					3.4 A			HCM 2010 Ctrl Delay HCM 2010 LOS
								Intersection Summary
0.0		6.1				5.2	0.0	Green Ext Time (p_c), s
2.3		3.3				7.1	2.1	Max Q Clear Time (g_c+l1), s
17.0		34.0				25.5	4.0	Max Green Setting (Gmax), s
4.5		4.5				4.5	4.5	Change Period (Y+Rc), s
5.7		38.5				33.5	5.0	Phs Duration (G+Y+Rc), s
8		6				2	_	Assigned Phs
8	7	6	5	4	3	2	1	Timer
			A	A			С	Approach LOS
			3.6	1.6			23.1	Approach Delay, s/veh
			532	227			16	Approach Vol, veh/h
		A	A	A	Α	C	C	LnGrp LOS
		2.8	3.8	1.6	2.4	23.7	21.8	LnGrp Delay(d),s/veh
		0.2	2.7	0.7	0.0	0.2	0.1	%ile BackOfQ(50%),veh/ln
		0.0	0.0	0.0	0.0	0.0	0.0	Initial Q Delay(d3),s/veh
		0.0	0.2	0.2	0.0	2.7	0.8	Incr Delay (d2), s/veh
		2.7	3.5	1.3	2.4	21.0	21.0	Uniform Delay (d), s/veh
		1.00	1.00	1.00	1.00	1.00	1.00	Upstream Filter(I)
		1.00	1.00	1.00	1.00	1.00	1.00	HCM Platoon Ratio
		1048	1233	1445	797	620	695	Avail Cap(c_a), veh/h
		0.06	0.38	0.15	0.02	0.24	0.10	V/C Ratio(X)
		1048	1233	1445	656	46	51	Lane Grp Cap(c), veh/h
		1.00			1.00	1.00	1.00	Prop In Lane
		0.6	5.1	1.3	0.1	0.3	0.1	Cycle Q Clear(g_c), s
		0.6	5.1	1.3	0.1	0.3	0.1	Q Serve(g_s), s
		1599	1881	1881	1792	1615	1810	Grp Sat Flow(s),veh/h/ln
		58	474	216	11	11	5	Grp Volume(v), veh/h
		1599	1881	1881	1792	1615	1810	Sat Flow, veh/h
		0.66	0.66	0.77	0.01	0.03	0.03	Arrive On Green
		1048	1233	1445	656	46	51	Cap. veh/h
		1	1		1	0 0	0,,0	Percent Heavy Veh %
		0.95	0.95	0.95	0.95	95.	0.95	Peak Hour Factor
		ا د	1,4	1	_ =	_ =	ے د	Adj No of lanes
		1001	177	216	11	11	1900	Adj Sacriow, verrivili
		1001	100	1001	1001	100	1000	raiking bus, Auj
		1.0	3	3	1.00	3 .	1.00	Porking Bis Adi
		3 0	c	c	100	3 0	3	Bod Bike Adi/A BAT
		7 C	0 1	0	o -	0 0	o 0	Initial O (Ok) wak
		13 23	200	700	ے د	18	ی د	Number
		л 2	450	205	10	100	лс	Fitting Volume (veh/h)
		л Л	An →	ეე. →	j 1	3 -4	л _ј	Lane Configurations
		SWR	SWT	NET	NEL	SER	SEL	Movement
			,	`	`	*		
		ť	K	ų.	Ħ	_	٤	

Tumwater Transportation Master Plan SCJ Alliance

HCM 2010 TWSC 57: Center St & 76th Ave

Projected 2022 without improvements
PM Peak Hour

HOM 95th %tile O(veh)	HCM Lane LOS	HCM Control Delay (s)	HCM Lane V/C Ratio	Capacity (veh/h)	Minor Lane/Major Mvmt	HCM LOS	HCM Control Delay, s	Approach	Stage 2	Stage 1	Mov Cap-2 Maneuver	Mov Cap-1 Maneuver	Platoon blocked, %	Stage 2	Stage 1	Pot Cap-1 Maneuver	Follow-up Hdwy	Critical Hdwy Stg 2	Critical Hdwy Stg 1	Critical Hdwy	Stage 2	Stage 1	Conflicting Flow All	Major/Minor	Mvmt Flow	Heavy Vehicles, %	Peak Hour Factor	Grade, %	Veh in Median Storage, #	Storage Length	RT Channelized	Sign Control	Conflicting Peds, #/hr	Future Vol, veh/h	Traffic Vol, veh/h	Movement	IIIt Deldy, sivell 2.0	Intersection
0	A	8.2	0.001	1109	NBL	C	19.9	EB	668	599	311	311		701	600			6.13	6.13	7.13	307	432	739	Minor2	65	ω	92					Stop	0	60	60	EBL	Ċ	
,	Þ	0		,	NBT				669	574	347	347		670	581			5.53	5.53	6.53	290	432	722		=	ω	92	0	0		,	Stop	0	10	10	EBT		
,			,		NBR E					,		639		ï		639	3.327		,	6.23		,	410		_	ω	92	,			None	Stop	0	_	_	EBR		
0.9	0	19.9			BLn1V																			-														
0.3	В	14		442	WBLn1	В	14	WB	561	698	316	316		580	699			6.21	6.21	7.21	438	290	728	/linor1	=	=	92	,	,		,	Stop	0	10	10	WBL		
0	Þ	7.9	0.009	1268	SBL				535	655	318	318		541	656			5.61	5.61	6.61	478	290	768		=	=	92	0	0		,	Stop	0	10	10	WBT		
,	Þ	0		,	SBT					,		730		í		730	3.399			6.31			288		22	=	92	,	,		None	Stop	0	20	20	WBR		
					SBR		0	NB	l.			1109				1109	2.209			4.11			457	Major1	1	_	92					Free	0		1	NBL		
												Ī											0		288				0			_	0		265	NBT		
														í	·	í				í		·	0		0							Free	0	0	0	NBR		
							0.2	SB	ı.			1268				1268	2.227			4.13			288	Major2	1	ω	92					Free	0	10	10	SBL		
													,	í		,			,	í		,	0		364	ω	92	0	0			Free	0	335	335	SBT		
																							0		92	ω	92				None	Free	0	85	85	SBR		

Synchro 9 Report 6/10/2016

Tumwater Transportation Master Plan SCJ Alliance

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

Projected 2022 without improvements

PM Peak Hour

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SEL	SET	SER	NWL	TWN	NWR	NEL	NET	NER	SWL	SWT	SWR
JI.	→	74	J,	₩			\$ →		JI.	¥	
110	865	10	2	540	115	15	5	5	150	5	60
110	865	10	2	540	115	15	5	51	150	5	60
1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
150		50	50		0	0		0	150		0
_		_	_		0	0		0	_		0
25			25			25			25		
		Yes			Yes			Yes			Yes
	50			50			30			30	
	3620			1652			415			2274	
	49.4			22.5			9.4			51.7	
0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
1%	1%	1%	2%	2%	2%	3%	3%	3%	1%	1%	1%
pm+pt	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
_	6			2			4			00	
6		6	2			4			8		
_	6	6	2	2		4	4		8	8	
5.0	10.0	10.0	10.0	10.0		5.0	5.0			5.0	
10.5	25.5	25.5	26.5	26.5		33.5	33.5			33.5	
		56.5	45.5	45.5		33.5	33.5			33.5	
		62.8%	50.6%	50.6%		37.2%	37.2%			37.2%	
		4.0	4.0	4.0		4.0	4.0			4.0	
1.5		1.5	1.5	1.5		1.5	1.5			1.5	
0.0		0.0	0.0	0.0			0.0		0.0	0.0	
5.5		5.5	5.5	5.5			5.5		5.5	5.5	
Lead			Lag	Lag							
Yes			Yes	Yes							
None	Max	Max	Max	Max		None	None		None	None	
Other											
+-											
oolullated											
	Lane Group Lane Configurations Tradii: Volume (vph) Tradii: Volume (vph) Storage Length (ft) Storage Length (ft) Storage Length (ft) Storage Length (ft) Taper Length (ft) Taper Length (ft) Storage Length (ft) Storage Length (ft) Taper Line (s) Taper Length (ft) Taper Line (s) Taper Length (ft) Storage Length (ft) Taper Line (s) Taper Length (ft) Deakt Jur Pactor Taper Length (ft) Total Spitt (6.	SET 865 865 865 1900 3620 49.4 0.87 1% 6 6 62.8% 62.8% 62.8% 62.8% 65.56.56 55.5 55.5 55.5 00 55.5 Max	SET SER 8.65 10 865 10 1900 1900 50 1 1 1900 1900 50 1 1 17 18 18 NA Perm 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	SET SER NWL NW A T	SET SER NWL NWT N A 7 5 50 865 10 2 540 865 10 2 540 1900 1900 1900 1900 1 50 50 1 1 1 1 1 1 1 1 1 1 1	SET SER NWL NWT NWR A 7 7 2 540 115 865 10 2 540 115 865 10 2 540 115 865 10 2 540 115 865 10 2 540 115 865 10 2 540 115 865 10 2 540 115 865 10 2 540 115 900 1900 1900 1900 50 50 50 0 1 1 1 0 25 Yes 50 49.4 22.5 28.7 0.87 1% 1% 2% 2% 2% NA Perm Perm NA 6 2 2 25 26 6 6 2 2 6 6 2 2 6 6 6 2 2 2 6 6 6 2 2 6 6 2 2 2 6 6 6 2 2 6 6 6 2 2 6 6 6 2 2 7 100 10.0 10.0 10.0 55 55.5 26.5 26.5 56.5 56.5 45.5 45.5 56.8 50.6% 50.6% 1.5 1.5 1.5 1.5 0.0 0.0 0.0 0.0 5.5 5.5 5.5 5.5 5.5 5.5 5.5 5.5 5.5 5.5 5.5	SET SER NWL NWT NWR NEL A 7	SET SER NWL NWT NWR NEL NET NER A 7	SET SER NWL NWT NWR NEL NET NER SWL A 7	SET SER NWL NWT NWR NEL NET NER SWL A 7

X 08

58: Old Hwy 99 & Henderson Blvd

Tumwater Transportation Master Plan SCJ Alliance

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

Projected 2022 without improvements
PM Peak Hour

SEL SET SER I 110 865 10 110 865 10 110 865 10 110 865 10 110 100 1.00 1.00 1.00 1.00 1.00 1.00													
SEL SET SER	,	*	×	×	5	×	a	¥	×)	_	×	*
↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑	Novement S	巴	SET	SER	NWL	TWN	NWR	NEL	NET	NER	SWL	TWS	SWR
110 865 10 110 865 10 1 1 6 6 16 0 0 0 1.00 1.00 1.00 1.00 1.00 1.00 1.0		_#	→	-14	_#	ॐ			\$ →		_#	❖	
110 805 10 110 100 100 1100 1.01 1.01 1.02 994 11 1.03 99 1332 1132 0.06 0.71 0.71 1792 1881 1599 126 994 11 1792 1881 1599 126 994 11 1792 1881 1599 126 994 11 1792 1881 1599 127 100 1.		3 6	865	3 7	ر د	540	115	1 5	n on	n on	150	n on	60
0 0 0 1.00 1.00 1.00 1.00 1.00 1.00 1.0			6	7 5	υ N	2	12	7	4	14	ω ξ	ω (2 2
1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00	2 (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
1.00 1.00 1.00 1.01 1.00 1.00 1.081 1.081 1.26 994 11 1 1 1 0.87 0.87 8.7 0.87 1 1 1 1.399 1332 1132 0.06 0.71 0.71 1792 1881 1599 1792 1881 1599 19 23.6 0.1 1,00 23.6 0.1 1,00 1.00 3.99 1332 1132 0.32 0.75 0.01 2.21 332 1132 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00	bT)	8		1.00	1.00		1.00	1.00		1.00	1.00		1.00
1881 1881 1881 1881 1881 1881 1881 188			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
120 774 11 1 1 1 1 1 1 1 1 1 299 1332 1132 1006 0.71 0.71 1792 1881 1599 1792 1881 1599 19 23.6 0.1 109 23.6 0.1 100 1.00 1.00 399 1332 1132 100 1.00 1.00 100 1.00 1.00 100 1.00 1.00 100 0.0 0.0 100 0.0 0.0 0.0 0.0 100 0.0 0.0 0.0 0.0 100 0.0 0.0 0.0 0.0 0.0 100 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	ח		1881	1881	1863	1863	1900	1900	1845	1900	1881	1881	1900
0.87 0.87 0.87 1.87 1.87 1.87 1.87 1.87 1.87 1.87 1				=	<u> </u>		0	0	_ <	0	1	_ 0	0 0
1 1 1 399 1332 1132 0.06 0.71 0.71 1792 1881 1599 126 994 11 1199 23.6 0.1 1.9 23.6 0.1 1.9 23.6 0.1 1.00 2.3 0.75 0.01 422 1332 1132 0.32 0.75 0.01 422 1332 1132 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00			0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
399 1332 1132 0.06 0.71 0.71 1792 1881 1599 126 994 11 1792 1881 1599 1.9 23.6 0.1 1.9 23.6 0.1 1.00 1.00 2.00 1.00 1.00 2.00 1.00 1.00 2.00 1.00 1.00 2.00 1.00 1.00 2.00 1.00 1.00 2.00 1.00 1.00 2.00 1.00 1.00 2.00 1.00 1.00 2.00 1.00 1.00 2.00 1.00 1.00 2.00 1.00 1.00 2.00 1.00 1.00 2.00 1.00 1.00 2.00 1.00 1.00 2.01 1.00 1.00 2.02 3.8 0.0 2.03 3.1 0.1 2.04 1.05 3.1 2.05 3.1 2.07 3.01 2.08 3.1 3.1 3.1 4.09 1.33 3.1 4.00 1.33 3.1 4.00 1.33 3.1 5.5 5.5 5.5 5.5 5.5 5.5 5.5 5.5 5.5 5.5 5.5			_	_	2	2	2	ω	ω	ω	_	_	_
1006 0.71 0.71 1792 1881 1599 1286 994 11 1792 1881 1599 19 23.6 0.1 1.00 239 1332 1132 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0			1332	1132	313	846	180	162	56	36	312	18	207
1792 1881 1599 1792 1881 1599 19 23.6 0.1 11.9 23.6 0.1 1.00 23.9 1332 1132 0.32 0.75 0.01 242 1332 1132 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00	ireen		0.71	0.71	0.57	0.57	0.57	0.14	0.14	0.14	0.14	0.14	0.14
126 994 11 1792 1881 1599 19 23.6 0.1 1.9 23.6 0.1 1.00 1.00 2.39 132 1132 0.32 0.75 0.01 422 1332 1132 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00		١.	1881	1599	558	1490	317	592	405	260	1410	129	1489
1792 1881 1599 1792 1881 1599 1891 1599 19 23.6 0.1 1.00 2.399 1332 1132 0.32 0.75 0.01 422 1332 1132 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00	Grp Volume(v), veh/h 1	26	994	1	2	0	753	29	0	0	172	0	75
19 23.6 0.1 1.00 23.6 0.1 1.00 23.6 0.1 1.00 1.00 3.99 1332 1132 0.32 0.75 0.01 422 1332 1332 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00			1881	1599	558	0	1807	1257	0	0	1410	0	1618
1.9 23.6 0.1 1.00 1.00 1.00 3.99 1332 1132 0.32 0.75 0.01 4.22 1332 1132 1.00 1.00 1.00 1.00 1.00 1.00 1.00 0.0 0.0 0.0 0.0 0.0 0.0 1.0 1.3 0.1 0.1 13.3 0.1 0.1 13.3 0.1 0.1 10.2 0.0 0.0 0.0 0.0 0.0 0.0 0.1 13.3 0.1 0.1 13.3 0.1 0.1 13.3 0.1 0.2 3.8 0.0 0.1 1.0 13.3 0.1 0.1 14.4 14.4 0.2 3 0.3 1 0.4 14.4 0.5 5.5 4.0 0 0.5 3.9 24.2 0.5 5.5 4.0 0 0.7 10.2			23.6	0.1	0.2	0.0	22.2	0.0	0.0	0.0	4.6	0.0	3.0
399 132 1132 0.32 0.75 0.01 422 1332 1132 1.00 1.00 1.00 1.00 1.00 1.00 1.00 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 10.2 3.8 0.0 0.0 0.0 0.0 10.3 3.1 9.6 10.3 3.1 9.6 10.3 3.1 10.2 B 10.2 B 10.2 B 10.2 3.8 9.6 10.3 3.1 10.2 B 10.2 B 10.2 B 10.2 B 10.2 B	r(g_c), s		23.6	0.1	13.6	0.0	22.2	3.0	0.0	0.0	7.7	0.0	3.0
0.32 0.75 0.00 0.32 1.75 0.00 0.32 1.75 0.00 0.20 1.00 1.00 1.00 1.00 1.00 1.00 1.00 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 1.0 1.3 0.1 0.1 13.3 0.1 0.2 13.3 0.1 0.4 B A 1131 10.2 B 10.3 3.1 A B A 1131 10.2 B 10.2 B 10.2 B 10.2 B 10.2 B 10.2 B 10.3 10.2 B 10.2 B 10.3 10.2 B 10.3 11 2 3 11 2 3 11 2 3 11 2 3 11 2 3 11 2 3 11 2 3 11 2 3 11 2 3 11 2 3 11 2 3 11 3 11 2 3 11 3 11 2 3 11 3 11 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	n(c) veh/h		1222	1133	21.0	>	1026	0.59	>	0.21	313	>	225
422 1332 1132 1.00 1.00 1.00 1.00 1.00 1.00 1.00 0.0 9,4 6.5 3.1 0.2 3.8 0.0 0.0 0.0 0.0 0.0 1.0 13.3 0.1 9,6 10.3 3.1 A B A 1131 10.2 B 11 2 3 11 2 10.2 B 11 2 3 11 2 10.2 B 11 2 3 11 46.4 146.4 15.5 5.5 10.1 46.4 16.4 17.5 40.0 17.5 3.9 24.2 17.5 10.0 10.2			0.75	0.01	0.01	0.00	0.73	0.11	0.00	0.00	0.55	0.00	0.33
1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00			1332	1132	313	0	1026	614	0	0	664	0	629
1.00 1.00 9.4 6.5 3.1 0.2 3.8 0.0 0.0 0.0 0.0 1.0 13.3 0.1 9.6 10.3 3.1 A B A 1131 10.2 B A 1131 10.2 B A 1131 10.2 B A 10.2 C B 10.1 C C C C C C C C C C C C C C C C C C C			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
9.4 0.3 3.1 0.0 0.0 0.0 0.0 0.0 0.0 1.0 13.3 0.1 9.6 10.3 3.1 A B A 1131 10.2 B B A 112 B A 1131 10.2 B 3 1 2 3 1 3 1) 		1.00	3.00	1.00	0.00	1.00	7.00	0.00	0.00	7.00	0.00	00.1
00 00 00 10 00 00 10 133 0.1 9.6 10.3 3.1 A B A 1131 10.2 B B 1 2 3 1 2 3 1 2 3 1 2 3 1 46.4 10.1 46.4 10.2 5.5 5.5 40.0 10.3 3.1 A B B A	<u>=</u>	3.4	بر ص	0.0	0.0	0.0	A 7	0.1	0.0	0.0	0.6	0.0	0.0
10. 13.3 0.1 9.6 10.3 3.1 A B A 1131 10.2 B B 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 46.4 5.5 40.0), s 5.5 40.0), s 3.9 24.2 0.0 10.2	eh	.0 i	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9.6 10.3 3.1 A B A 11131 10.2 B B 1 2 3 1 2 3 1 2 3 1 2 3 1 1 2 3 1 2 3 1 46.4 5.5 5.5 5.5 40.0 1.5 3.9 24.2 0.0 10.2	'n	.0	13.3	0.1	0.0	0.0	12.2	0.5	0.0	0.0	ယ	0.0	1.4
A B A 1131 10.2 B 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 46.4 1 5.5 5.5 40.0 1.5 5.5 40.0 1.5 5.5 40.0 1.5 5.5 40.0 1.0 1.2	nGrp 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
1131 10.2 B 1 2 3 1 2 3 1 2 3 1 1 2 10.1 46.4 10.1 46.4 10.1 46.4 10.0 5.5 5.5 40.0 10.2 3 10.2 3 10	nGrp LOS		В	Þ	В		В	0			0		0
10.2 B 1 2 3 1 2 3 1 1 2 10.1 46.4 5.5 5.5 5.5 40.0),s 5.5 40.0),s 3.9 24.2 0.0 10.2	Approach Vol, veh/h		1131			755			29			247	
B 1 2 3 1 2 3 10.1 46.4 5.5 5.5 5.5 40.0). \$ 5.5 40.0 0.0 10.2	pproach Delay, s/veh		10.2			16.2			27.2			29.7	
1 2 3 1 2 10.1 46.4 5.5 5.5 5.5 40.0).s 5.5 40.0 0.0 10.2	ach LOS		В			В			С			C	
1 2 10.1 46.4 5.5 5.5),s 5.5 40.0),s 3.9 24.2 0.0 10.2		_	2	ω	4	5	6	7	ω				
10.1 46.4 5.5 5.5),s 5.5 40.0),s 3.9 24.2 0.0 10.2	ssigned Phs	_	2		4		6		8				
s 5.5 5.5 ax), s 5.5 40.0 -11), s 3.9 24.2 0.0 10.2	S	12	46.4		15.5		56.5		15.5				
ax), s 5.5 40.0 -(1), s 3.9 24.2 0.0 10.2			5.5		5.5		5.5		5.5				
0.0 10.2			40.0		28.0		51.0		28.0				
0.0	.11), 3		10.0		0.0		120		0.4				
Clicit Guilliai y		8	6		5		3		9				
010 Ctrl Delay 14.7	action Summary			147									
	Intersection Summary			B -									

Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

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

Projected 2022 without improvements

Wovement Traffic Vol, veh/h Fruture Vol, veh/h Conflicting Peds, #/hr Sign Control RT Chamelized RT Chamelized Strage Length Veh in Median Storage, # Grade, % Peak Hour Factor	EBL 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	EBT 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	EBR 10 10 0 Stop None	WBL 15 15 0 Stop - - - 95	WBT 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	WBR 115 115 115 Stop None 300 95		SEL 1115 1115 1115 0 0 Free - 250 - 95	Fr. 9
Heavy Vehicles, % Wwmt Flow	1 2	1 2	11 2	1 16	0 1	121		121	
Major/Minor Conflicting Flow All	Minor1 1699	1707	963	Minor2 1705	1699	492		Major1 500	Major1 0
Stage 2 Critical Hdwy	494 7.12	502	6.22	1211 7.11	1205 6.51	6.21		4.11	4.11 .
Critical Hdwy Stg 1 Critical Hdwy Stg 2	6.12 6.12	5.52		6.11 6.11	5.51 5.51				
ollow-up Hdwy ot Cap-1 Maneuver	3.518 73		3.318	3.509 73	4.009 93	3.309		2.209	2.209 - 1069 -
Stage 1 Stage 2	225 557	257 542		559 224	548 258				
Mov Cap-1 Maneuver	53	<u>&</u>	310	64	82	579		1069	1069 -
Mov Cap-2 Maneuver Stage 1	53 200	81 228		64 496	82 547				
Stage 2	440	541		191	229				
Approach	EB EB			NB WB				SE	SE
HCM LOS	D			C C					-
Minor Lane/Major Mvmt	NWL	TWN	NWR EBL	₩ B	WBLn2	SEL	SE	I SE	I SE
HCM Lane V/C Ratio	/ 9			64		1069			
ICM Control Delay (s)	0.001		- 0.067	0.24/		0.113			
HCM Lane LOS	0.001 10 B	A 0		78.8 78.8		0.113 8.8 A			

Tumwater Transportation Master Plan SCJ Alliance

HCM 2010 TWSC 60: Kimmie St & 83rd Ave

Projected 2022 without improvements

Intersection Int Delay, s/veh 2.7 Movement Traffic Vol, veh/h Future Vol, veh/h Conflicting Peds, #/hr	7 WBL 45 45	WBR 15	NBT 40 40 0	NBR 15 15 0	SBL 5	SBT 115 115 0
ign Control	Stop	Stop	Free	Free		Free
RT Channelized	١ د	None		None		
Veh in Median Storage, #	0 0		0 -			
Grade, %	0		0			
Peak Hour Factor	82	82	82	82		82
Heavy Vehicles, %	ω	ω	9	9		ω
Mvmt Flow	55	18	49	18		6
Maior/Minor	Minor1		Major1			Major2
Conflicting Flow All	210	58	0	0		67
Stage 1	58					
Stage 2	152					
Critical Hdwy	6.43	6.23				4.13
Critical Hdwy Stg 1	5.43					
Follow-up Hdwy	3.527	3.327				2.227
Pot Cap-1 Maneuver	776	1005				1528
Stage 1	962					
Stage 2	874					
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	Þ					
Vinor Lane/Major Mvmt	NBT	NBRWBLn1 SBL	SBT			
Sapacity (veh/h)						
HCM Control Delay (s)		- 9.8 7.4				
HCM Lane LOS		A				
HCM 95th %tile Q(veh)						

Tumwater Transportation Master Plan Synchro 9 Report SCJ Alliance 6/10/2016

HCM 2010 TWSC 61: 83rd Ave & Center St

Projected 2022 without improvements
PM Peak Hour

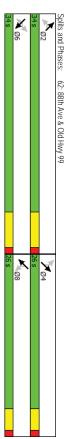
nt Delay, s/veh 8	51					
Novement	EBL	EBT	WBT	T WBR	SBL	SBR
raffic Vol, veh/h	70	20		$^{\sim}$	200	75
Future Vol, veh/h	70	20	10		200	75
Conflicting Peds, #/hr	0	0			0	cton 0
Sign Control	Free	None	Flee	e Free	clob	dols
Storage Length		- NOITE			э,	- NOITE
/eh in Median Storage, #		0	0		0 0	
Grade, %		0			0	
Peak Hour Factor	88	88	00		88	88
Heavy Vehicles, %		_			_	_ ;
√vmt Flow	80	23	_	1 125	227	85
// Major/Minor	Major1		Major2	2	Minor2	
Conflicting Flow All	136	0		- 0	256	74
Stage 1					74	
Stage 2		·			182	
ritical Hdwy	4.11				6.41	6.21
Critical Hdwy Stg 1					5.41	
critical Hdwy Stg 2					5.41	
ollow-up Hdwy	2.209				3.509 735	3.309 99 0
Stage 1					951	
Stage 2					852	
Platoon blocked, %						
Nov Cap-1 Maneuver	1454				694	990
Mov Cap-2 Maneuver					694	
Stage 1					951	
Stage 2				ı.	804	
pproach	EB		WB	ω	SB	
HCM Control Delay, s	5.9			0	13.1	
HCM LOS					В	
Ainor Lane/Major Mvmt	EBL	EBT WBT	「WBR SBLn1			
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	Þ	В			
HCM 95th %tile Q(veh)	0.2		2			
com your some extensy						

Tumwater Transportation Master Plan SCJ Alliance

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

Projected 2022 without improvements
PM Peak Hour

205 205 205 205 205 207 1 1 2 25 27	NET 10 10 10 10 10 10 10 10 10 10 10 10 10	NET NER SWL 10 25 2 110 25 2 11900 1900 1900 0 0 0 0 0 0 11160 26.4 NA Perm
		NET NER 10 25 10 25 1900 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0



Tumwater Transportation Master Plan SCJ Alliance

Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

Projected 2022 without improvements

PM Peak Hour

HCM 2010 Signalized Intersection Summary 62: 88th Ave & Old Hwy 99

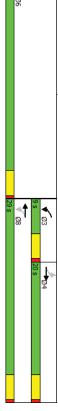
		•	1		•		•			`		
	(×	*	ħ	,	~	J	×	١	×	*	
Movement	SEL	SET	SER	NWL	TWN	NWR	NEL	NET	NER	SWL	SWT	
Lane Configurations	_71	->	-34	_3(❖		_71	æ>			\$ →	
Traffic Volume (veh/h)	0	785	220	10	310	0	205	10	25	2	J (J)	
Number	ے د	6	16	л ट	ى د	13 0	7	<u> </u>	14	۸ د	ж с	
Initial Q (Ob), veh	0 -	0	0 0	0 0	0 1	0 5	0 -	0 4	0 1	0 4	0	
Ped-Bike Adj(A_pbT)	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/h/ln	1863	1881	1881	1881	1881	1900	1845	1850	1900	1900	1863	
Adj Flow Rate, veh/h	0	872	244	=	344	0	228	1	28	2	σ ₁	
Adj No. of Lanes	_	_	_	_	_	0	_	_	0	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	
Percent Heavy Veh, %	2	_	_	_	_	_	ω	2	2	2	2	
Cap, veh/h	150	1100	935	265	1100	0	438	95	243	140	268	
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	
Sat Flow, veh/h	1032	1881	1599	508	1881	0	1391	463	1179	225	1299	
Grp Volume(v), veh/h	0	872	244	=======================================	344	0	228	0	39	00	0	
Grp Sat Flow(s),veh/h/ln	1032	1881	1599	508	1881	0	1391	0	1642	1742	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	
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	
Prop In Lane	1.00		1.00	1.00		0.00	1.00	>	0.72	0.25		
Lane Grp Cap(c), ven/n	150	070	935	265	100	8 0	438	000	339	453	3 0	
Avail Cap(c a), veh/h	150	1100	935	265	1100	0	791	0	754	877	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	
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	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	
Incr Delay (d2), s/veh	0.0	5.9	0.7	0.3	0.7	0.0	1.0	0.0	0.1	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	
%ile BackOfQ(50%),veh/ln	0.0	10.5	1.7	0.1	2.5	0.0	3.0	0.0	0.4	0.1	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	
LnGrp LOS		σ.	Þ	σ.	Þ		σ.		σ.	55		1
Approach Vol, veh/h		1116			355			267			00	
Approach Delay, s/veh		11.8			6.1			18.5			15.2	
Approach LOS		В			Α			В			В	
Timer		2	ယ	4	5	6	7	00				
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 (Gmax), s		28.0		22.0		28.0		22.0				
Max Q Clear Time (g_c+l1), s		20.0		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			В									

Lanes, Volumes, Timings 63: I-5 SB Ramps & 93rd Ave

Projected 2022 without improvements
PM Peak Hour

Natural Cycle: 33 Control Type: Actuated-Uncoordinated	Actuated Cycle	Cycle Length: 60	\rea Type:	ntersection Summar	Recall Mode	_ead-Lag Optimize?	_ead/Lag	Total Lost Time (s)	ost Time Adjust (s)	All-Red Time (s)	fellow Time (s)	Total Split (%)	otal Split (s)	Minimum Split (s)	Ainimum Initial	Switch Phase	Detector Phase	Permitted Phases	Protected Phases	Turn Type	Shared Lane Traffic (%	Heavy Vehicles (%)	Peak Hour Factor	ravel Time (s)	ink Distance (ft)	ink Speed (mph)	Right Turn on Red	aper Length (ft)	Storage Lanes	Storage Length (ft)	deal Flow (vphpl)	uture Volume (vph)	raffic Volume (vph)	ane Configurations	ane Group	
ctuated-Unco	Length: 57.3		0	nmary		ize?		(s)	t (s)					٣	(s)			SS	SS		affic (%)	(%)	or		_	<u> </u>	ed)		(#)	ĕ	(hdv)	yph)	ions		
ordinated			Other		None	Yes	Lag			0.5	3.5	33.3%	20.0	20.0	4.0		4	4				1%	0.88					25	0	0	1900	0	0		EBL	-
					None	Yes	Lag	4.0	0.0	0.5	3.5	33.3%	20.0	20.0	4.0		4		4	NA		1%	0.88	25.5	1124	30					1900	325	325	₽	EBT	ţ
																						1%	0.88				Yes		0	0	1900	45	45		EBR	1
					None	Yes	Lead				3.5			8.0	4.0		ω	00	ω	pm+pt		9%	0.88					25	_	150	1900	130	130	JI.	WBL	4
					None			4.0	0.0	0.5	3.5	48.3%	29.0	20.0	4.0		œ		00	NA		9%	0.88	16.0	936	40					1900	180	180	→	WBT	†
																						9%	0.88				Yes		0	0	1900	0	0		WBR	/
																						0%	0.88					25	0	0	1900	0	0		NBL	•
																						0%	0.88	25.0	1099	30					1900	0	0		NBT	→
												5										0%	0.88				Yes		0	0	1900	0	0		NBR	•
					Max						3.5		31.0	20.0	4.0		6	6		Perm		4%	0.88					25	0	0	1900	520	520		SBL	•
					Max			4.0	0.0	0.5	3.5		31.0	20.0	4.0		6		6	NA		4%	0.88	37.4	1644	30					1900	0	0	ž,	SBT	—
					Max			4.0	0.0	0.5	3.5	51.7%	31.0	20.0	4.0		6	6		Perm		4%	0.88				Yes		_	300	1900	315	315	-4	SBR	*

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



Tumwater Transportation Master Plan SCJ Alliance

Synchro 9 Report 6/10/2016

HCM 2010 Signalized Intersection Summary 63: I-5 SB Ramps & 93rd Ave

	Projected 2
	2022 \
	without
P	
/ Peak H	mprovement
\sim	=

Feb. Feb. Feb. Feb. Web.						WBR 0 0 11.00 11.00 0 0 0 0 0 0 0 0 0 0 0 0	0 0	- NBT -	NBR CONTRACTOR OF THE PROPERTY	520 520 520 1.00 1.00 1.00 1.00 1.00 1.00 1.00 591 0.88 4 791 1.740 591 1.740 16.7 1.00 791 1.00 791 1.00 16.7 1.00 16.7 1.00 16.7 1.00 10.7 10.7 10.7 10.7 10.7 10.7 10	SBT SBT 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	SBR 315 315 16 0 1.00 1.00
tons (Ap) (Ap) (Ap) (Ap) (Ap) (Ap) (Ap) (Ap)	r r					0 11.00 1.00 1.00 0 0 0 0 0 0 0 0 0 0 0	0.0	0 0	00	520 520 520 1.00 1.00 1.00 1.00 591 0.45 4 791 0.45 1740 1740 16.7 1.00 791 1.00 791 1.00 791 1.00 791 1.00 1.00 6.45 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0	1.00 1827	311 311 311 10 10 1.00
welrhh) 0 325 45 130 180 0 0 0 520 6 ah 0 0 0 0 0 0 0 520 0 pbh) 100 100 100 100 100 100 100 pbh/lin 100 130 11 1 1 0 0 1 0 or 0.88	ਤ <u>ਤੋਂ</u> ੱ					0 118 0 1.00 1.00 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.0	0.0	00	520 520 100 1,00 1,00 1,00 1,00 1,00 591 0,045 1,740 1	0 0 6 6 0 1.00 1827	31! 31! 31! 10 1.00 1.00
(yehrh) 0 325 45 130 180 0 0 0 520 0 pbT) 100	т <u>т</u>					11.00 11.00 11.00 11.00 0 0 0 0 0 0 0 0		•		520 1.00 1.00 1.00 1.00 1.00 1.00 1.00 591 0.88 4 791 0.45 1.740 1.740 1.740 1.740 1.771 1.740 1.771 1	0 6 0 1.00 1827	31! 10 1.00 1.00 182:
phi) 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0	ਤ ਤੋਂ <u>'</u>					1.00 1.00 1.00 0 0 0 0 0 0 0 0 0 0 0 0 0				1 1.00 1.00 1.00 1.900 591 0.88 4 791 0.45 1740 1740 1740 16.7 16.7 16.7 1.00 16.7 1.00 1.07 1.00 1.09 1.00 1.09 1.00 1.00 1.00 1.00	1.00 1827	100 1.00 1.00 182
ph						1.00 1.00 0 0 0 0.88 0 0 0 0 0 0 0 0 0 0 0 0 0				0 1.00 1.00 1900 591 0 0.88 4 791 0.45 1740 16.7 11.00 791 0.75 11.00 791 0.75 11.00 791 0.79 10.7 10.7 10.7 10.7 10.7 10.7 10.7 10.7	1.00 1827	1.00 1.00 182
pbil) 100 100 100 100 100 100 100 pbil) 100 100 100 100 100 100 100 100 100 10						1.00 1.00 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0				1.00 1.00 1.900 1.900 591 0 0.88 4 791 0.45 1740 1740 16.7 16.7 1.00 791 0.75 791 1.00 791 0.75 1.00 791 0.75 1.00 791 0.00 1.00 1.00 1.00 1.00 1.00 1.00 1.	1.00 1827 0	1.00 1.00 182
1.00 1.00						1.00 0 0 0.88 0 0 0 0 0 0 0 0 0 0 0 0 0 0				1.00 1900 591 0 0.88 4 791 1740 591 1740 16.7 1.00 791 1.00 791 1.00 791 1.00 791 1.00 791 1.00 791 1.00 791 0.75 6.4 6.4 6.4 6.4 6.4 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3 9.3	1.00 1827 0	1.00
hehlin 1900 1881 1900 1743 1743 0 1900 1827 1 1 1 1 0 5 1 1 1 1 0 5 1 1 1 1 0 5 1 1 1 1						0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0				1900 591 0 0.88 4 791 0.45 1740 591 1740 16.7 16.7 11.00 791 0.75 791 1.00 791 0.75 791 0.75 791 0.75 791 0.75 791 0.75 791 0.75 8 791 1.00 9 791 0.75 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0	1827 0	182
Debth 0 369 51 148 205 0 591 0 0 0 0 0 0 0 0 0						0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0				591 0 0.88 4 791 0.45 1740 591 1740 16.7 16.7 16.7 11.00 791 0.75 791 1.00 791 0.6.4 6.4 6.4 6.4 6.4 6.4 6.4 6.4	4 0	171
s 0 1 0 1 0 1 0 1 0 0 1 0 0 0 0 0 0 0 0						0 0.88 0 0.88 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0				0 0.88 4 791 1740 591 1740 16.7 16.7 1.00 1791 1.00 791 1.00 791 1.00 1.10 791 1.00 1.10 791 1.00 1.34 6.4 0.0 9.3 9.3	_	lo
or 0.88 0.88 0.88 0.88 0.88 0.88 0.88 0.8						0.88 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0				0.88 4 791 0.45 1740 591 1740 16.7 16.7 10.0 791 0.75 791 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.	-	
Veh, % 1 1 1 1 9 9 0 4 5 0 791 0 0 1740 0 0 1 6 0 7 1 0 0 1 4 4 4 4 4 4 4 4 4 4 0 0 1 4 0 0 1 4 0 0 1 4 0 0 1 1 0 0 1 1 0 0 0 0 1 1 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 <th< td=""><td></td><td></td><td></td><td></td><td></td><td>0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td><td></td><td></td><td></td><td>4 791 0.45 1740 591 16.7 16.7 10.0 791 0.75 791 1.00 1.00 1.00 1.00 1.3.4 6.4 6.4 0.0 9.3 19.8 B</td><td>0.88</td><td>0.88</td></th<>						0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0				4 791 0.45 1740 591 16.7 16.7 10.0 791 0.75 791 1.00 1.00 1.00 1.00 1.3.4 6.4 6.4 0.0 9.3 19.8 B	0.88	0.88
1						0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0				791 0.45 1740 591 1740 16.7 16.7 1.00 791 0.75 791 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.	4	
n 0.00 0.26 0.26 0.08 0.41 0.00 0.45 0.00 1740 0 1740 0 1740 0 1740 0 1740 0 1740 0 1740 0 1740 0 1740 0 1740 0 1740 0 1740 0 1740 0 1 1740 0 1 1740 0 1 1740 0 1 1740 0 1 1740 0 1 1740 0 1 1740 0 1 1740 0 1 1740 0 1 1740 0 1 1740 0 1 1 0 0 1 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0						0.00 0 0 0 0.0 0.0 0.0 0 0.0 0 0 0 0 0				0.45 1740 591 1740 16.7 16.7 1.00 791 0.75 791 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.	0	706
0 1618 224 1660 1743 0 1740 0 1 vehhhn 0 0 420 148 205 0 591 0 0 vehhhn 0 0 1842 1660 1743 0 1740 0 1 vehhhn 0 0 1842 1660 1743 0 1740 0 1 vehhhn 0 0 1842 1660 1743 0 167 0 0 c.), s 0.0 0.0 13.0 3.6 4.7 0.0 16.7 0.0), vehhh 0 0 0.478 297 716 0 000 1.00 vehh 0 0 0 488 0.50 0.29 0.00 791 0 vehh 0 0 0 00 1.00 1.00 1.00 1.00 1.00 d), sveh 0 0 0.0 1.01 1.00 1.00 1.00 1.00 sveh 0 0 0 0.0 21.1 149 11.7 0.0 1.00 sveh 0 0 0 0.0 8.7 18 2.3 0.0 0.0 1.34 0.0 sveh 0 0 0 0.0 37.2 16.2 11.9 0.0 1.0 sveh 0 0 0 37.2 16.2 11.9 0.0 1.0 sveh 0 0 0 37.2 16.2 11.9 0.0 1.9 sveh 0 0 0 37.2 16.2 11.9 0.0 19.8 ehh 420 353 67 8 ehh 420 353 67 8 ehh 420 353 72 18.7 ing (Gnas). s 40 40 40 40 (V-Rc), s 40 40 40 40 ing (Gnas). s 56 150 187 667 eleg-chi). s 56 150 187 667 eleg-chi). s 353 3.6 endary C 222						0 0 0 0.0 0.0 0.0 0.00 0.00 0.00 0.00				1740 591 1740 16.7 16.7 10.0 791 0.75 791 1.00 1.00 1.00 1.3.4 6.4 0.0 9.3	0.00	0.45
webhin 0 420 148 205 0 591 0 yebhilin 0 0 142 148 205 0 1740 0 11740 0 0 11740 0 <t< td=""><td></td><td></td><td></td><td></td><td></td><td>0 0.0 0.0 0.0 0 0.00 0 0 0.00 0 0.00 0 0.00</td><td></td><td></td><td></td><td>591 1740 16.7 10.7 10.0 791 0.75 791 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.</td><td>0</td><td>1553</td></t<>						0 0.0 0.0 0.0 0 0.00 0 0 0.00 0 0.00 0 0.00				591 1740 16.7 10.7 10.0 791 0.75 791 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.	0	1553
Nehhrlin 0 1842 1660 1743 0 11740 0 11740 0 11740 0 11740 0 11740 0 11740 0 11740 0 11740 0 11740 0 11740 0 11740 0 11740 0 11740 0 1167 0 0 0 1167 0 0 0 1167 0						0 0.0 0.0 0.00 0 0 0 0 0 0 0 0 0 0 0 0				1740 16.7 16.7 1.00 791 0.75 791 1.00 1.00 1.00 1.00 1.00 1.00 9.3 19.8	0	165
Color Colo						0.0 0.0 0.00 0 0 0 0 0 0 0 0 0 0 0 0 0				16.7 1.00 791 0.75 791 1.00 1.00 1.00 1.3.4 6.4 0.0 9.3 19.8	0	1553
_c), s						0.00 0.00 0 0 0.00 0 1.00 0.00				16.7 1.00 791 0.75 791 1.00 1.00 13.4 6.4 0.0 9.3 19.8	0.0	3.0
Delay Dela						0.00 0 0.00 0 0.00 0.00				1.00 791 0.75 791 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.	0.0	.د
), veh/h 000 000 000 000 008 050 009 000 000 000 000 000 000 000 000						0.00 0.00 1.00 0.00				791 0.75 791 1.00 1.00 13.4 6.4 0.0 9.3 19.8 B		1.00
Oxford O						0.00 0 1.00 0.00				0.75 791 1.00 1.00 13.4 6.4 0.0 9.3 19.8	0	706
wonn 0 0 496 297 734 0 791 0 atib 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 t) 0.00 0.00 1.00 1.00 1.00 1.00 1.00 sych 0.0 0.0 21.1 1.49 11.7 0.0 1.34 0.0 3).sych 0.0 0.0 1.1 1.3 0.2 0.0 6.4 0.0 3).sych 0.0						1.00				1.00 1.00 13.4 6.4 0.0 9.3 19.8	0.00	0.2
ano 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0						0.00				1.00 1.00 13.4 6.4 0.0 9.3 19.8	0	700
0) 0 000 1.00 1.00 1.00 000 1.00 000 1.00 000 1.00 000 1.00 0.00 1.00 0.00 1.00 0	ö					0.00				1.00 13.4 6.4 0.0 9.3 19.8	1.00	1.00
Sylveh 0.0 0.0 16.1 14.9 11.7 0.0 13.4 0.0 5ylveh 0.0 0.0 16.1 13.0 0.0 0.0 6.4 0.0 3), sylveh 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.			ľ			0.0				13.4 6.4 0.0 9.3 19.8 B	0.00	1.00
Syven 0.0 0.0 16.1 1.3 0.2 0.0 0.0 0.3 0.0 0.0 0.0 0.0 0.0 0.0 0.0	én				11./	0				0.0 9.3 19.8 B	0.0	9.9
Sysveh OBOS), Syeh OBOS), Sye			16.1		0.2	0.0				9.3 19.8 B	0.0	0.2
Obs/yennin 0.0 0.0 1.8 2.3 0.0 9.3 0.0 skveh 0.0 0.0 37.2 16.2 11.9 0.0 19.8 0.0 eh/h 420 0.0 35.3 756			0.0		0.0	0.0				19.8 B	0.0	0.0
Silveri 0.0 0.0 3.2 16.2 11.9 0.0 19.8 0.0 eh/h 420 5.8 8 756 13.7 17.8 17.8 bh/h 37.2 13.7 17.8 D B B B B B B B B B B B B B B B B B B			3.7		2.3	0.0				В В	0.0	<u>.</u>
bhh 420 353 , sveh 37.2 13.7 D B B B B B B B B B B B B B B B B B B	y(u),s/ven		31.2			0.0				æ	0.0	
ehlh 420 353 , S/Neh 37.2 13.7 1 2 3 4 5 6 7 8 1 2 3 4 5 6 7 8 1 4 6 8 1 4 7 8 1 7 8 1 7 8 1 8 7 8 1 8 8 1 8 8 1 90 194 310 284 1 94 40 40 40 1 94 10 40 1 94 10 40 1 94 10 40 1 94 10 40 1 95 150 160 270 250 1 96 150 187 67 1 90 194 310 36 1 90 194 310 36 1 90 194 310 36 1 90 194 310 36 1 90 194 310 36 1 90 194 310 36	LnGrp LOS		c		α							L
1 2 3 4 5 6 7 8 1 2 3 4 5 6 8 4 4 5 6 8 8 4 6 8 8 4 6 8 8 7 8 1 1 2 3 4 6 8 1 2 3 4 6 8 1 2 3 4 6 8 1 2 3 4 6 8 1 2 3 4 6 8 1 2 3 4 6 8 1 2 3 4 6 8 1 2 3 4 6 8 1 2 3 4 6 8 1 2 3 4 6 8 1 2 3 4 6 8 1 2 3 4 6 8 1 2 3 4 6 8 1 3 10 284 4 0 40 4 0 40 4 0 40 5 6 150 187 67 6 7 6 7 6 9 6 7 6 9 6 7 6 9 7 6 9 7 6 9 7 6 9 7 6 9 7 6 9 8 6 9 8 6 9 8 7 9 9 9 9 9 9 8 9 9 9 9 9 9 8 9 9 9 9 9	Approach Vol, veh/h	420			353						756	
1 2 3 4 5 6 7 8	Approach Delay, s/ven	3/.2			3.7						-/.8	
1 2 3 4 5 6 7 ***A********************************	Approach LUS				σ						Œ	
####C).s 9.0 19.4 31.0 (Y+Rc).s 4.0 4.0 4.0 (ing (Gmax).s 5.0 16.0 27.0 (g.c+I1).s 5.6 15.0 18.7 (p.c).s 0.0 0.4 3.0 ###################################	Timer 1	2	ω	4	5	6	7	œ				
+/+Rc), s 9,0 19,4 31.0 (y(+kc), s 4,0 4,0 4,0 4,0 (y(g(max), s 5,0 16,0 27.0 me (g_c+l1), s 5,6 15,0 18,7 (p_c), s 0,0 0,4 3,0 Delay 22.2 Delay 22.2	Assigned Phs			4		6		8				
(Y+Rc), s 4.0 4.0 27.0 27.0 16.0 27.0 16.0 27.0 16.0 27.0 16.0 18.7 16.0 18.7 (p_c), s 0.0 0.4 3.0 16.0 16.0 16.0 16.0 16.0 16.0 16.0 16	Phs Duration (G+Y+Rc), s			19.4		31.0		28.4				
ing (Gmax), s 5.0 16.0 27.0 ine (g_c+i1), s 5.6 15.0 18.7 (p_c), s 0.0 0.4 3.0 minary Delay 22.2 C	Change Period (Y+Rc), s			4.0		4.0		4.0				
ne (q.c+11), s 5.6 15.0 18.7 (p.c), s 0.0 0.4 3.0 (nmary 22.2 C	Max Green Setting (Gmax), s			16.0		27.0		25.0				
(p_C), s 0.0 0.4 3.0 mmary 22.2 C C C C C C C C C C C C C C C C C C C	Max Q Clear Time (g_c+l1), s			15.0		18.7		6.7				
nmary Delay	Green Ext Time (p_c), s			0.4		3.0		3.6				
Delay	Intersection Summary											
,	HCM 2010 Ctrl Delay		22.2									
	HCM 2010 LOS		C									

Tumwater Transportation Master Plan SCJ Alliance

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	V	BL M	WBT \	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	260	540	0				370	70	0	125	0	0	0
Future Vol, veh/h	260	540	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	Ŧ			Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	,		None		ř		Yield		ï	Yield			None
Storage Length	125		,		٠		300		,				,
Veh in Median Storage, #	,	0	í		•	0			0			0	,
Grade, %		0	,		٠	0			0			0	,
Peak Hour Factor	94	94	94		94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	ω	ω	ω		∞	∞	00	14	7	14	0	0	0
Mvmt Flow	277	574	0		0	287	394	74	0	133	0	0	0
Major/Minor	Major1			Major2	or2			Minor1					
Conflicting Flow All	287	0	,			÷	0	1415	1415	574			
Stage 1					•	·		1128	1128				
Stage 2					٠			287	287				
Critical Hdwy	4.13				•			6.54	6.64	6.34			
Critical Hdwy Stg 1	ı.				٠			5.54	5.64				
Critical Hdwy Stg 2					٠								
Follow-up Hdwy	2.227		۰ د		۱ د					3.426			
Pot Cap-1 Maneuver	1269		0		0		٠	142	130	496			
Stage 1			0		0			293	266				
Stage 2			0		0			735	653				
Platoon blocked, %													
Mov Cap-1 Maneuver	1269				٠			111	0	496			
Mov Cap-2 Maneuver					٠	٠		=======================================	0				
Stage 1								229	0				
Stage 2		١.	١.					735	0				
Approach	EB			V	WB			NB					
HCM Control Delay, s	2.8				0			14.4					
HCM LOS								В					
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT WBR	R								
Capacity (veh/h)	590	1269											
HCM Lane V/C Ratio	0.352	0.218			٠								
HCM Control Delay (s)	14.4	8.6			٠								
HCM Lane LOS	В	A			٠								
HCM 95th %tile Q(veh)	1.6	0.8			•								

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HCM 2010 TWSC 65: Kimmie St & 93rd Ave

Projected 2022 without improvements
PM Peak Hour

HCM Lane LOS	HCM Control Delay (s)	HCM Lane V/C Ratio	Capacity (veh/h)	Minor Lane,	HCM LOS	HCM Control Delay, s	Approach	Stage 2	Stage 1	Mov Cap-2 Maneuver	Mov Cap-1 Maneuver	Platoon blocked, %	Stage 2	Stage 1	Pot Cap-1 Maneuver	Follow-up Hdwy	Critical Hdwy Stg 2	Critical Hdw	Critical Hdwy	Stage 2	Stage 1	Conflicting Flow All	Major/Minor	Mvmt Flow	Heavy Vehicles, %	Peak Hour Factor	Grade, %	Veh in Med	Storage Length	RT Channelized	Sign Control	Conflicting Peds, #/hr	Future Vol, veh/h	Traffic Vol, veh/h	Movement	Int Delay, s/veh	II II JOCOTIOII
LOS	ol Delay (s)	V/C Ratio	eh/h)	//linor Lane/Major Mvmt		ol Delay, s		9.2	91	Maneuver	Maneuver	cked, %	92	01	Maneuver	ldwy	√Stg 2	vyStg1	< > <	9.2	-	Flow All	,		des, %	Factor		/eh in Median Storage, #	ngth	lized	_	Peds, #/hr	veh/h	veh/h		veh 2	
0 0	24.8		210	NBLn1		0.5	EB				1079				1079	2.236			4.14			473	Major1	37	4	94					Free	0	35	35	EBL	.4	
0 A	8.5	0.035	1079	EBL					,		í		,		,		i		í			0		532	4	94	0	0			Free	0	500	500	EBT		
. Α	0	,		EBT					·	ı	í	·			·	,	i		í		í	0		16	4	94		í		None	Free	0	15	15	EBR		
			·	EBR																			~														
o 20	8.5	0.005	1027	WBL		0.1	WB		,		1027				1027	2.209	ï		4.11			548	lajor2	5	_	94	,	ï			Free	0	5	5	WBL		
. ⊳	0	,		WBT							í		į.		,		í		í			0		463	_	94	0	0			Free	0	435	435	WBT		
		- 0		WBR SBLn1						,												0		=======================================	_	94				None	Free	0	10	10	WBR		
1 0	18.5	0.275	367	SLn1																			≤														
					C	24.8	NB	467	459	149	149		544	483	182	3.5	6.1	6.1	7.1	519	614	1133	inor1	16	0	94		ï				0	5	15	NBL		
								551	462	203	203		555	486	215	4	5.5	5.5	6.5	484	614	1098		2	0	94	0	0			Stop	0	2	2	NBT		
											546				546	ယ ယ	·		6.2		·	540		1	0	94		í		None	Stop	0	10	10	NBR		
					C	18.5	SB	436	534	174	174		470	562	187	3.545	6.15	6.15	7.15	621	479	1100	Minor2	21	(II	94					Stop	0	20	20	SBL		
								451			197						5.55		6.55	622	479	1101		5				0		,	Stop		5		. SBT		
											589					3.345			6.25			468		7.	G.	. 9.			ĺ	· None	Stop		70	70	SBR		

Tumwater Transportation Master Plan SCJ Alliance

HCM 2010 AWSC 66: Case Rd & 93rd Ave

Projected 2022 without improvements

Intersection												
Intersection Delay, s/veh	42.9											
Intersection LOS	Е											
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	ω	ω	ω	2	2	2	2	2	0	0	0
Mvmt Flow	0	2	402	179	0	114	348	49	0	92	22	38
Number of Lanes	0	0	_	0	0	0	_	_	0	0	_	0
Assessor		3				Š				Ž		
Appidacii		ED				WD				NE		
Opposing Approach		WB				EB				WS		
Opposing Lanes		2				_				_		
Conflicting Approach Left		WS				NE				EB		
Conflicting Lanes Left		_				_				_		
Conflicting Approach Right		NE				WS				WB		
Conflicting Lanes Right		_				_				2		
HCM Control Delay		61				39.1				14.7		
HCM LOS		-				г				8		
Lane		NELn1	EBLn1	WBLn1	WBLn2	SWLn1						
Vol Left, %		61%	0%	25%	0%	65%						
Vol Thru, %		14%	69%	75%	0%	34%						
Vol Right, %		25%	31%	0%	100%	1%						
Sign Control		Stop	Stop	Stop	Stop	Stop						
Traffic Vol by Lane		140	537	425	45	146						
LT Vol		85	2	105	0	95						
Through Vol		20	370	320	0	50						
RT Vol		35	165	0	45	_						
Lane Flow Rate		152	584	462	49	159						
Geometry Grp		2	57	7	7	2						
Degree of Util (X)		0.331	0.995	0.883	0.082	0.351						
Departure Headway (Hd)		1.824	0.139	0.98	6.13/	7.952						
Convergence, Y/N		YeS	Foa	res	res	Yes						
Capica Time		7 227 10-	7 227	1 69 1	2 227	1,303						
HCM Lane V/C Patio		0.00	1	0 885	0.007	0 35						
HCM Control Delay		1/1 7	61 -	A2 2	0.000	15.00						
HCM Land LOS		0 1	n ^c	7.74	> \.	7 .						
LCM FQUE FOO		,	7	г	1							
		, c				, (

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Tumwater Transportation Master Plan SCJ Alliance

HCM 2010 AWSC 66: Case Rd & 93rd Ave

Projected 2022 without improvements PM Peak Hour

Intersection					
Intersection Delay, s/veh					
Intersection LOS					
Movement	UWS	SWL	SWT	SWR	
Traffic Vol, veh/h	0	95	50	_	
Future Vol, veh/h	0	95	50	_	
Peak Hour Factor	0.92	0.92	0.92		
Heavy Vehides, %	2	_	_	_	
Mvmt Flow	0	103	54	_	
Number of Lanes	0	0	_	0	
Approach					
Opposing Approach		WS			
		NE			
Opposing Lanes		NE NE			
Opposing Lanes Conflicting Approach Left		SW NE NE			
Opposing Lanes Conflicting Approach Left Conflicting Lanes Left		SW NE 1 WB			
Opposing Lanes Conflicting Approach Left Conflicting Lanes Left Conflicting Approach Right		SW NE 1 WB 2			
Opposing Lanes Conflicting Approach Left Conflicting Lanes Left Conflicting Approach Right Conflicting Approach Right		SW NE NE NE NE BB			
Opposing Lanes Conflicting Approach Left Conflicting Lanes Left Conflicting Approach Right Conflicting Approach Right Conflicting Lanes Right HCM Control Delay		SW NE NE NE NE 1 1 15.2			
Opposing Lanes Conflicting Approach Left Conflicting Lanes Left Conflicting Approach Right Conflicting Approach Right Conflicting Lanes Right HCM Control Delay HCM LOS		SW NE 1 WB 2 EB 1 15.2			
Opposing Lanes Conflicting Approach Left Conflicting Lanes Left Conflicting Approach Right Conflicting Lanes Right HCM Confrol Delay HCM LOS		NE N			

Tumwater Transportation Master Plan SCJ Alliance

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

Projected 2022 without improvements
PM Peak Hour

Intersection									
Intersection Delay, s/veh	24.6								
Intersection LOS	C								
Movement	EBU	EBT	EBR	WBU	WBL	WBT	NBU	NBL	NBF
Traffic Vol, veh/h	0	305	190	0	100	315	0	145	70
Future Vol, veh/h	0	305	190	0	100	315	0	145	70
Peak Hour Factor	0.92	0.87	0.87	0.92	0.87	0.87	0.92	0.87	0.87
Heavy Vehicles, %	2	ω	ω	2	2	2	2	_	
Mvmt Flow	0	351	218	0	115	362	0	167	80
Number of Lanes	0	_	0	0	0	_	0	_	
Approach		EB			WB			NB	
Opposing Approach		WB			ΕB				
Opposing Lanes					_			0	
Conflicting Approach Left					NB			EB	
Conflicting Lanes Left		0			_			_	
Conflicting Approach Right		NB						WB	
Conflicting Lanes Right		_			0			_	
HCM Control Delay		29.6			23.7			14.6	
HCM LOS		D			С			σ.	
Lane	NBLn1	1 EBLn1	WBLn1						
Vol Left, %	67%	% 0%	24%						
Vol Thru, %	0%	6	76%						
Vol Right, %	33%		0%						
Sign Control	Sto		Stop						
Traffic Vol by Lane	215		415						
LT Vol	14		100						
Through Vol	0	0 305	315						
RT Vol	7		0						
Lane Flow Rate	24		477						
Geometry Grp			_						
Degree of Util (X)	0.442		0.748						
Departure Headway (Hd)	6.442	2 5.289	5.642						
Convergence, Y/N	Yes		Yes						
Cap	556		639						
Service Time	4.522	w	3.709						
HCM Lane V/C Ratio	0.444		0.746						
HCM Control Delay	14.6		23.7						
HCM Lane LOS	В		C						
		0							

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Tumwater Transportation Master Plan SCJ Alliance

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

Projected 2022 without improvements
PM Peak Hour

WBT WBR SBL 175 20 35 175 20 0 0 0 Free Free Stop - None - 250 0 - 0 0 - 0 0 - 0 3 3 3 1 203 23 41 Major2 Minot2
<

Tumwater Transportation Master Plan SCJ Alliance

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

Projected 2022 without improvements

Intersection Int Delay, s/veh 4	42			
Vovement	EBT EBR	WBL WBT	NEL	NER
Traffic Vol, veh/h	675 30	115		175
uture Vol, veh/h	675 30	115	15	175
Conflicting Peds, #/hr		0		0
Sign Control		Free	ý	Stop
RT Channelized				None
Storage Length	- 450	300		0
/eh in Median Storage, #				
Grade, %	0 -		0	,
eak Hour Factor		92		92
Heavy Vehicles, %		2		_
Wymt Flow	734 33	125 250		190
Major/Minor	Major1	Major2	Minor1	
Conflicting Flow All	0 0			734
Stage 1			. 734	
Stage 2				
Critical Hdwy		4.12 -	. 6.41	6.21
Critical Hdwy Stg 1				
Critical Hdwy Stg 2			5.41	
ollow-up Hdwy		2		3.309
ot Cap-1 Maneuver			. 196	422
Stage 1				
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)		- 871		
HCM Lane V/C Ratio	0.044 0.451 -	,		
HCM Control Delay (s)	20.3	- 9.8		
ICM Lane LOS	C	,		
TON FOLLOW				

Synchro 9 Report 6/10/2016

Tumwater Transportation Master Plan SCJ Alliance

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 works, 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 equal or higher priority 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 equal or lower priority 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 <u>low-stress</u> 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 is 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

			Percent Complete	
Mode	Hierarchy Level	Existing Year	Study Year ¹	Future Goal ²
Dodostvica	Primary Route	33%	TBD	TBD
Pedestrian	Secondary Route	36%	TBD	TBD
Diamela	Primary Route	45%	TBD	TBD
Bicycle	Secondary Route	27%	TBD	TBD

¹ Study Year percentages to completed with final Transportation Element project list.

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

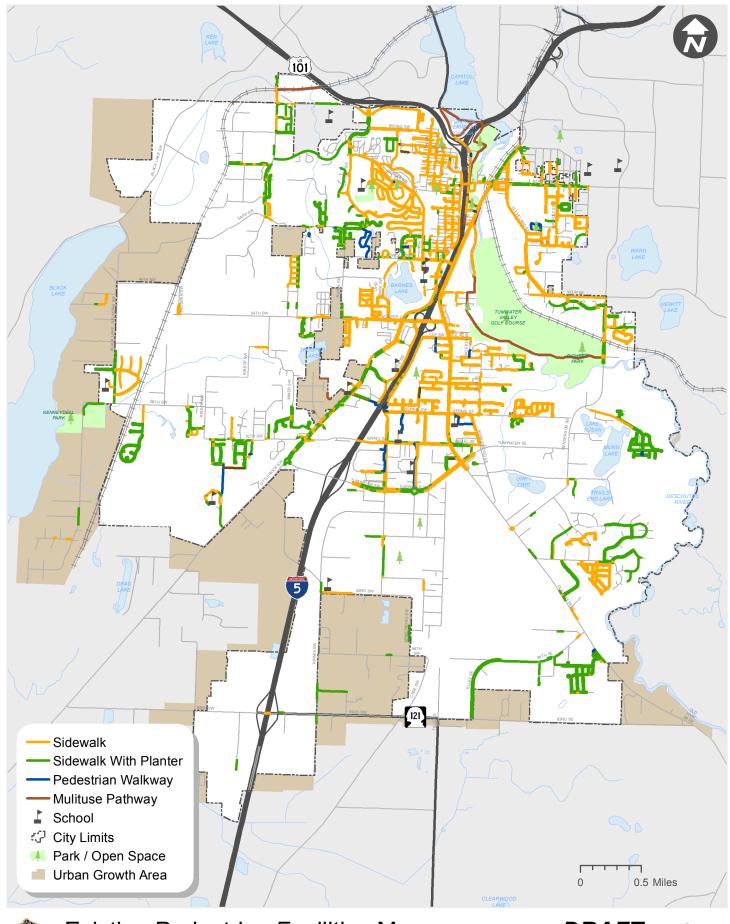
Every trip begins or ends with walking. Walking promotes physical activity among residents and provides connections among destinations that include shopping areas, parking lots, and recreational trips within parks and open space. A combination of walkways, sidewalks, and off-street pathways provides the core network for pedestrians.

² Future Goal to be set evaluated and set at a later date.

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.





Existing Pedestrian Facilities Map

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FIGURE

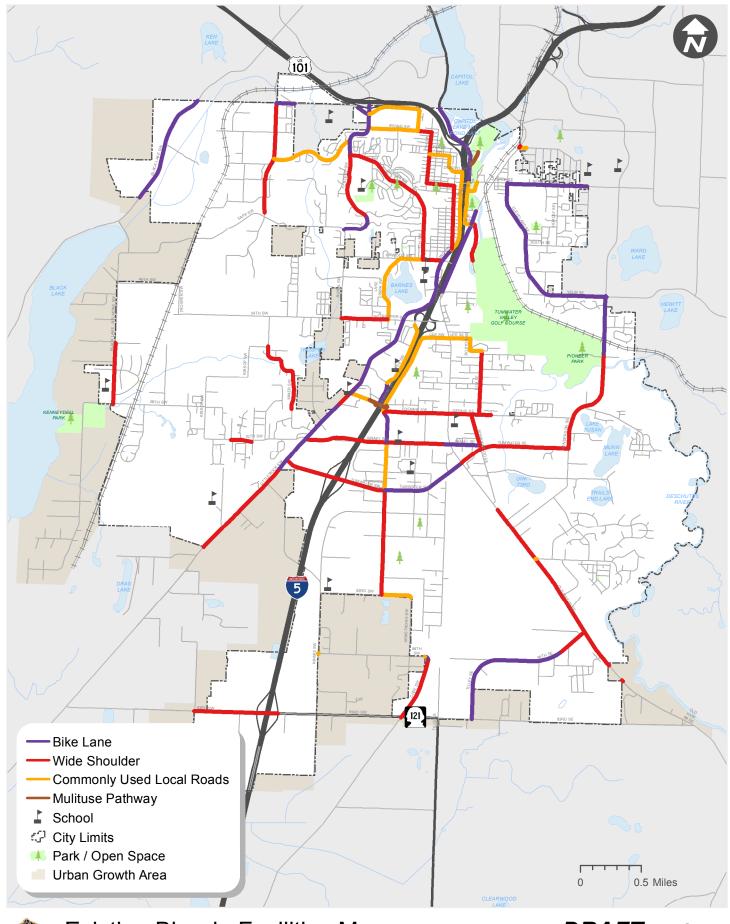
Bicycle Facilities

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

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FIGURE

Non-Motorized Network Hierarchy

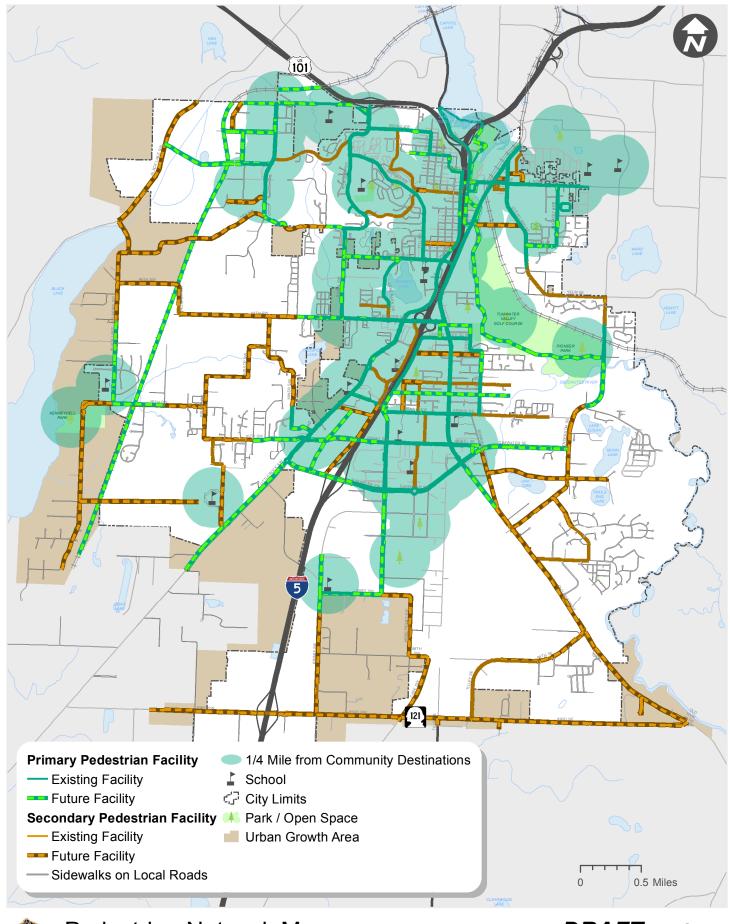
For the purposes of this sample existing analysis the primary and secondary routes were defined for the City of Tumwater network. They are defined separately for pedestrian and bicycle routes.

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

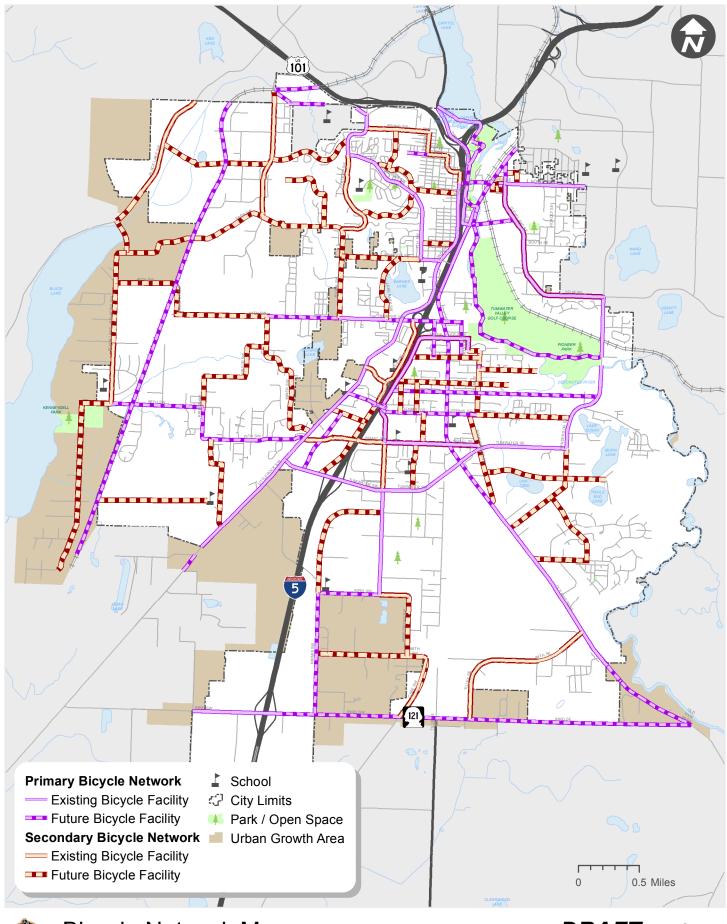
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Bicycle System

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.





Bicycle Network Map

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FIGURE



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

<u>Transportation-related Goals and Objectives from the Capitol</u> 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:

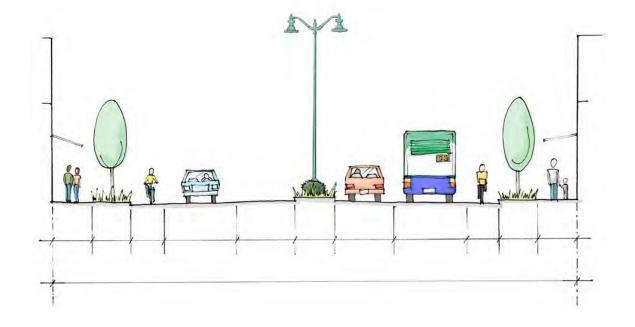
- Added travel lanes to quell congestion is neither feasible or desired
- A parallel street system should be pursued
- Ensure traffic operations help prioritize premium transit
- Enhance streetscape at major intersections and crossings
- Integrate and enhance bus stop facilities
- Establish parallel and intersecting bike network
- Establish parallel and intersecting walking routes

<u>Transportation System Recommendations:</u>

(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, redesignate 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.

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-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 / Trosper Road Value-Engineering (VE) study and complete center median curbing along Capitol Boulevard from Trosper 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 Trosper 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 Trosper 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 mixeduse 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.

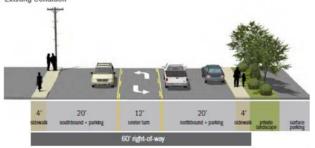
Create a strong sense of place by facilitating pedestrian access, establishing gathering places for residents and fostering a District identity.

- 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



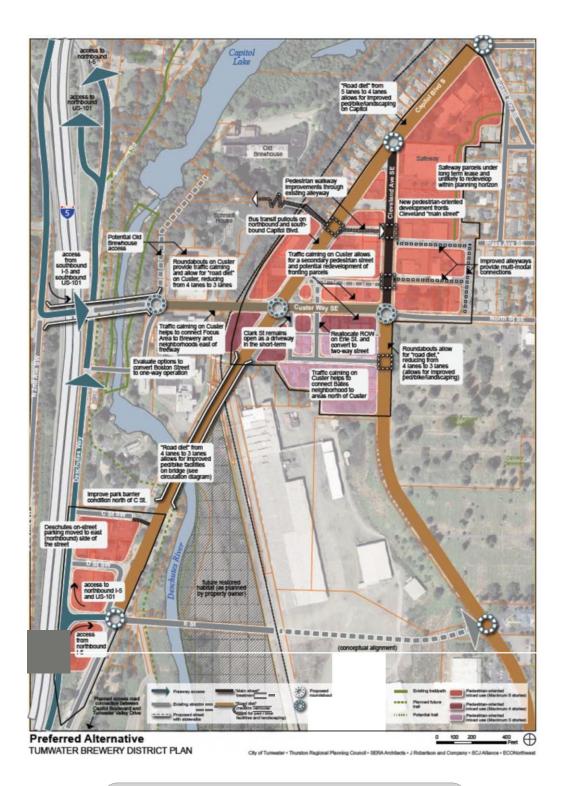
Custer Way - Custer Bridge to Cleveland Avenue Existing Condition:



Custer Way - Custer Bridge to Cleveland Avenue
Proposed Cross Section:

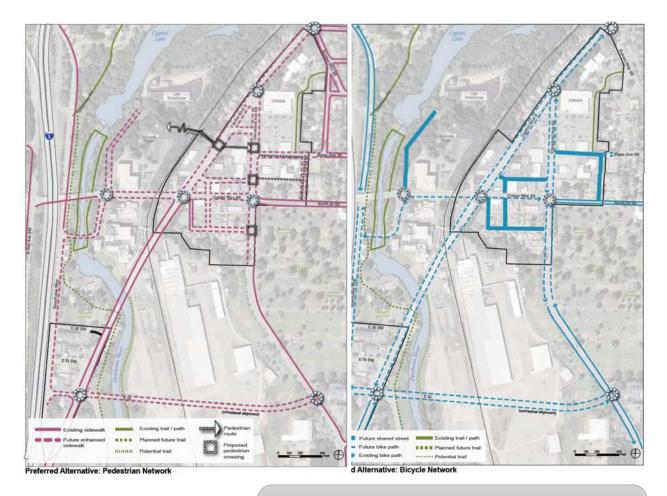
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The illustrations demonstrate how repurposing existing right-of-way can be used to create or enhance non-motorized facilities and contribute to the overall livability of a place. Cleveland Avenue, top, and Custer Way, bottom, will be reconfigured so 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

V



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.



and streetscape elements

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

pedestrians, bicycles, and landscaping

New development built up against the sidewalk (parking in rear)

Housing above ground floor commercial

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.

pedestrian crossing