Appendix A Methodology Memo

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City of The Dalles TSP Update

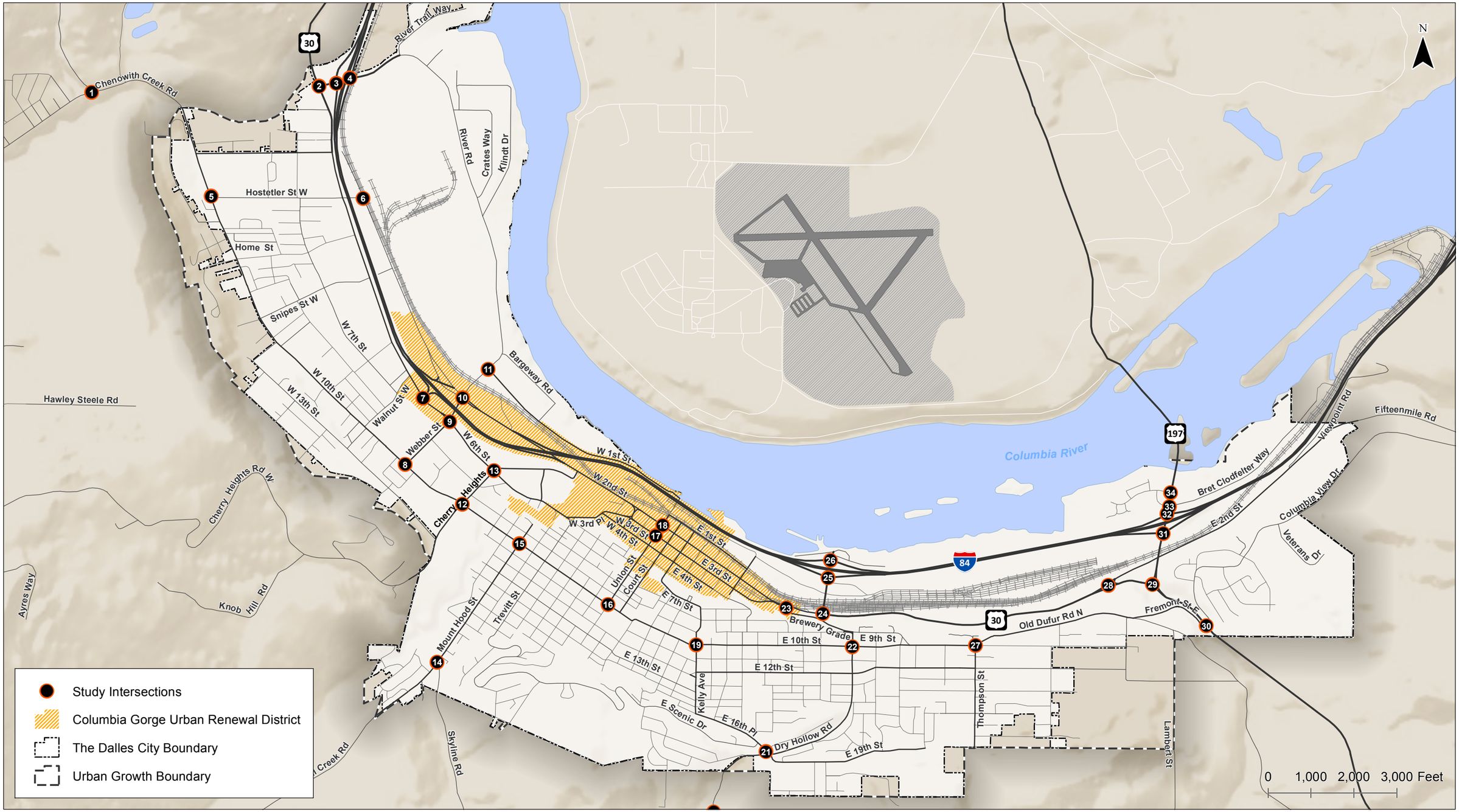
Methodology Memorandum

Date:	October 3, 2015	Project #: 18495
To:	Jim Bryant, ODOT Region 4	
From:	Casey Bergh, PE and Chris Brehmer, PE	
cc:	Peter Schuytema, TPAU; Ryan McKinnis, TPAU Dale McCabe, City of The Dalles	

This memorandum documents the methodology and key assumptions to be used in preparation of the existing and future conditions analyses for The Dalles Transportation System Plan (TSP) Update. The methodologies included in this memorandum are based on guidance provided in the Oregon Department of Transportation (ODOT) *Transportation System Plan Guidelines (2008)* and the *Analysis Procedures Manual* (APM), Versions 1 and 2 as they relate to The Dalles.

STUDY INTERSECTIONS

The traffic count locations for this project are outlined in Task 3.1 of the project Work Order Contract. The majority of the intersection turning movement traffic counts used for this study were conducted by ODOT in April and June 2015. The locations for these intersection counts were agreed upon by ODOT, the City of The Dalles, and the consultant team during the development of the project scope. The counts will be used to provide pedestrian volumes, bicycle volumes, truck volumes, passenger car volumes, and various calculation factors. Figure 1 shows the location of the study intersections and the corresponding Table 1 summarizes the intersection names and count duration (16-hour or 4-hour) at each location.



Study Area and Intersections
The Dalles, Oregon

Figure **1**

Coordinate System: NAD 1983 StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: Wasco County
Sources: Esri, USGS, NOAA

Oregon Department of Transportation

Kittelson & Associates, Inc.
Transportation Engineering/Planning

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Table 1. Study Intersections (Location of 16-Hour Intersection Classification Count)

ID Number	East-West Name	North-South Name	Count Duration
1	Seven Mile Hill Rd	Chenoweth Rd	4-hour
2	US 30	River Rd	16-hour
3	I-84 EB Ramps	River Rd	16-hour
4	I-84 WB Ramps	River Rd	16-hour
5	W 10th St	Hostetler Wy	4-hour
6	W 2nd St	Hostetler Wy	4-hour
7	I-84 EB Ramps	W 6th St	16-hour
8	Webber Rd	W 10th St	4-hour
9	Webber Rd	W 6th St	4-hour
10	Webber Rd	W 2nd St	4-hour
11	Webber Rd	W 1st St	4-hour
12	Cherry Hts Rd	W 10th St	4-hour
13	Cherry Hts Rd	W 6th St	4-hour
14	Mt Hood St	Skyline Rd	4-hour
15	Mt Hood St	W 10th St	4-hour
16	Union St	10th	4-hour
17	Union St	W 3rd St	4-hour
18	Union St	W 2nd St	4-hour
19	Kelly Ave	E 10th St	4-hour
20	Dry Hollow Rd	3 Mile Rd	4-hour
21	Dry Hollow Rd	E 16th Pl/19th St	4-hour
22	Dry Hollow Rd	E 10th St	4-hour
24	Brewery Overpass Rd	US 30	16-hour
25	Brewery Overpass Rd	I-84 EB Ramps	16-hour
26	Brewery Overpass Rd	I-84 WB Ramps	16-hour
27	Thompson St	E 10th St/Old Dufur Rd	4-hour
28	E 2nd St	US 30	4-hour
29	US 197	US 30	16-hour
30	US 197	Fremont St/Columbia Vw Dr	4-hour
31	US 197	I-84 EB Ramps	16-hour
32	US 197	I-84 WB Ramps	16-hour
33	US 197	Bret Clodfelter Wy	4-hour
34	US 197	Lone Pine Ln	4-hour

SYSTEM PEAK HOUR DEVELOPMENT

Per Section 5.3 of the APM, Version 2, the evening peak hour counts were reviewed to identify system peak hour trends. The combined total entering vehicle count at all study intersections was calculated at 15-minute increments. Exhibit 1 provides an hourly volume profile at 15-minute increments beginning at 2:00 PM.

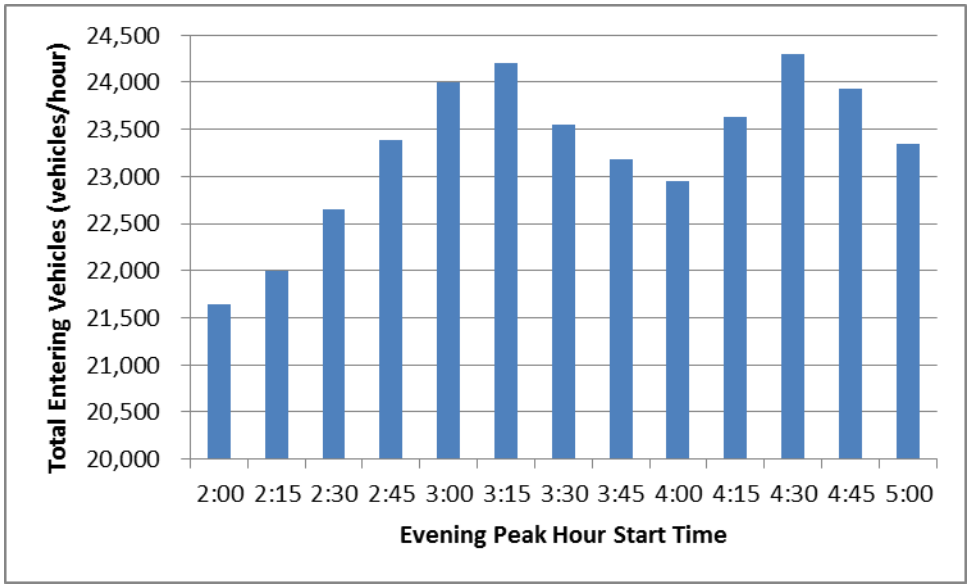


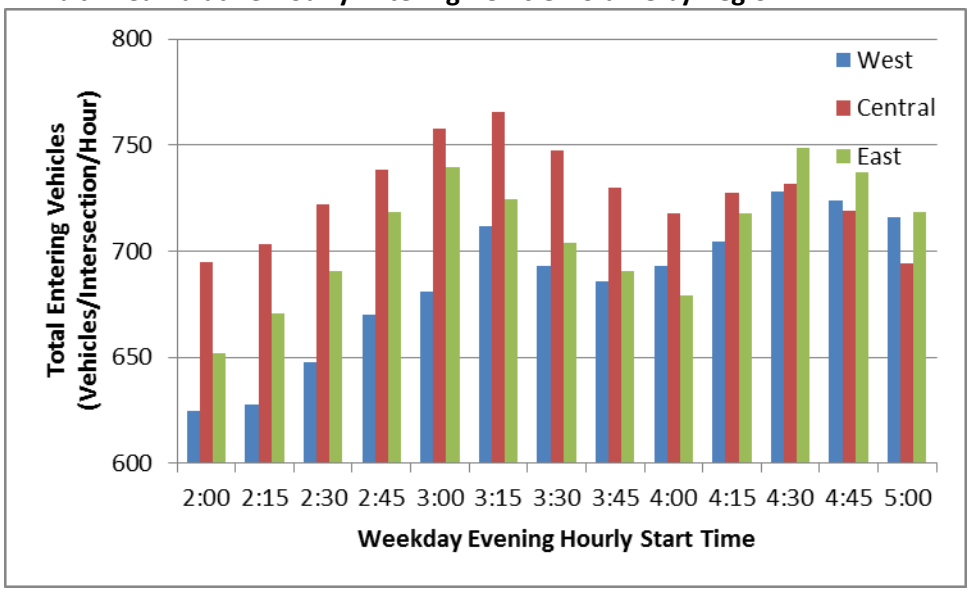
Exhibit 1: Combined Study Intersection Total Hourly Entering Vehicles

Given the presence of two distinct peaks within the afternoon/evening period, we evaluated whether regional, traffic control, or functional classification may be influencing peaking characteristics. The primary factor identified is that intersection volumes on the east and west ends of the City are peaking later than those within the central city. The time-of-day temporal differences in peaking by geographic area in part reflect land use patterns across the City (urban downtown vs. residential/school areas vs. various employment areas with industrial shift traffic vs. traditional office hours, etc.) Based on the trends observed, we recommend the use of three distinct system peak hour analysis periods for assessing intersection operations within the City, as summarized in Table 2. Exhibit 2 illustrates hourly volume trends by region within the City.

Table 2. Recommended System Peak Hours by Region

Region	Peak Hour	Study Intersections Included
West	4:30 to 5:30 PM	#1-9
Central	3:15-4:15 PM	#10-21
East	4:30 to 5:30 PM	#22-34

Exhibit 2: Cumulative Hourly Entering Vehicle Volume by Region



INTERSECTION OPERATIONAL STANDARDS

Per the project scope, we will evaluate and present the following performance measures for the study intersections:

- Turning movement counts;
- Volume-to-capacity (V/C) ratio;
- Level-of-service (LOS);
- Delay; and,
- 95th Percentile queuing (not-simulation based).

Individual study intersection performance will be documented in tables, figures, and/or technical appendices using the measures of effectiveness listed above. Where possible this information will be provided in figures to illustrate the analysis results in a format that is easy-to-understand and relate to the community. Study intersection performance will then be compared to applicable minimum City and ODOT operating standards/performance thresholds.

ODOT Facilities

For reference, Table 3 and 4 summarize the classifications and applicable performance thresholds for study intersections that fall within ODOT's jurisdiction.

Table 3. State Highway Classifications

Route Name (Hwy #)	Posted Speed (MPH)	Highway Classification	NHS	Freight/ Truck Route	Special Designations
I-84, Columbia River Hwy (2)	65	Interstate	Yes	Yes	None
US 197, The Dalles-California Hwy (4)	45	Regional	No	Yes[1]	None
US 30, Historic Columbia River Hwy (100)	40	District	No	No	Scenic Byway
US 30, Mosier-The Dalles Hwy (292)	40	District	No	No	None

NHS = National Highway System
[1] From I-84 to Columbia River

ODOT assesses intersection operations based on V/C ratio. Table 6 of the *Oregon Highway Plan* (OHP) provides V/C ratio targets statewide. The OHP ratios are used to evaluate existing and future no-build conditions, while Table 10-1 of the ODOT *2012 Highway Design Manual* (HDM) provides V/C ratios used to assist in identifying future system deficiencies and evaluating future alternatives on state highways. Table 4 synthesizes the respective ODOT performance requirements into a summary of those applicable to the study intersections.

Table 4. Summary of ODOT Intersection Performance Standards

ID Number	Street 1	Street 2	Traffic Control1	OHP Volume-to-Capacity Ratio Targets	HDM 20-year Design Mobility Standards
2	US 30	River Rd	TWSC	0.90	0.80
3	I-84 EB Ramps	River Rd	TWSC	0.80	0.70
4	I-84 WB Ramps	River Rd	TWSC	0.80	0.70
7	I-84 EB Ramps	W 6th St	TWSC	0.80	0.70
24	Brewery Overpass Rd	US 30	TWSC	0.90	0.80
25	Brewery Overpass Rd	I-84 EB Ramps	TWSC	0.80	0.70
26	Brewery Overpass Rd	I-84 WB Ramps	TWSC	0.80	0.70
28	E 2nd St	US 30	TWSC	0.90	0.80
29	US 197	US 30	TWSC	0.85	0.75
30	US 197	Fremont St/ Columbia Vw Dr	TWSC	0.85	0.75
31	US 197	I-84 EB Ramps	TWSC	0.80	0.70
32	US 197	I-84 WB Ramps	TWSC	0.80	0.70
33	US 197	Bret Clodfelter Wy	TWSC	0.85	0.75
34	US 197	Lone Pine Ln	TWSC	0.85	0.75

[1]TWSC: Two-way stop-controlled (unsignalized)

SEASONAL ADJUSTMENT FACTOR

30th highest hour design volumes will be based on applicable adjustment factors. Version 2 of the APM identifies three methods for identifying seasonal adjustment factors for highway traffic volumes.

All three methods utilize information provided by Automatic Traffic Recorders (ATR) situated in select locations throughout the State Highway System that collect traffic data 24-hours a day/365 days a year. There are two permanent ATR stations near The Dalles, but no ATRs are within The Dalles UGB.

- ATR 33-001: I-84, 0.72 mile west of the Rowena Interchange
- ATR 33-005: US 197, 0.84 mile south of Boyd Market Road

Based on the locations of ATR stations near The Dalles, a combination of all three seasonal adjustment methods outlined in the APM will be applied in developing adjusted study intersection volumes for the TSP update, including:

- US 197 – On-Site ATR Method
- I-84 Ramps – ATR Characteristic Table Method
- US 30 – Seasonal Trend Method

On-Site ATR Method

The On-Site ATR Method requires that the ATR be located within or near the project area. If the ATR is located outside the project area, there should be no major intersections between the ATR and the project area and the Average Annual Daily Traffic (AADT) collected by the ATR must be within 10 percent of the AADT near the project area. *Information on AADT for highway segments throughout Oregon can be found in ODOT's Transportation Volume Tables.*

While not located within The Dalles UGB, ATR 33-005 meets all of the requirements for the On-Site ATR Method for developing seasonal adjustment factors for US 197 approaches to study intersections. No major intersections exist between the ATR location and the study intersections in The Dalles.

Table 5. Seasonal Adjustment Factors for US 197 Approaches

Year	2009	2010	2011	2012	2013
Peak Month (August)	124%	123%	130%	129%	119%
Count Month (June)	111%	110%	108%	107%	109%

Note: Shaded values dropped from average calculation per ODOT methodology.

Based on the data in Table 5, average monthly factors were determined as follows:

- Peak month average: (124% + 123% + 129%) / 3 = 125.3%
- Count month average: (110% + 108% + 109%) / 3 = 109%
- Seasonal adjustment factors: 125.3 / 109 = 1.15

ATR Characteristic Table Method

The Characteristic Table Method requires that the ATR be located on a facility that shares similar characteristics with the facility to be adjusted, such as seasonal traffic trends, area type, and number of lanes. The Characteristic Table Method also requires that the AADT collected by the ATR must be within 10 percent of the AADT near the project area. AADT on I-84 in The Dalles ranges from 18,000 to 22,000 vehicles per day based on I-84 mainline volumes documented in ODOT Interchange Diagrams.

Two ATRs were selected from ODOT's ATR Characteristic Table for developing seasonal adjustment factors for I-84 ramps. ATR #17-001 is located along I-5, 2.08 miles south of the Monument Drive Interchange. At this location, I-5 is classified as an Interstate Highway in a Small Urban Fringe and the weekly traffic trend reflects weekday traffic. ATR #09-025 is located on US 97 within the City of Bend, but is not on an interstate. Therefore, only ATR 17-001 was used to develop a seasonal adjustment factor for the I-84 ramps.

Table 6 summarizes the average weekday traffic percent of average daily traffic (ADT) for the past five years.

Table 6. Seasonal Adjustment Factors for I-84 Ramp Approaches

Year	2009	2010	2011	2012	2013
Peak Month (July)	120%	122%	118%	117%	121%
Count Month (June)	109%	113%	112%	113%	112%

Note: Shaded values dropped from average calculation per ODOT methodology.

Based on the data in Table 6, average monthly factors were determined as follows:

- Peak month average: (120% + 118% + 121%) / 3 = 120%
- Count month average: (112% + 113% + 112%) / 3 = 112%
- Seasonal adjustment factors: 120 / 112 = 1.07

Seasonal Trend Method

The Seasonal Trend Method uses average values from the ODOT ATR Characteristic Table for each seasonal traffic trend. For US 30 approaches in The Dalles, "Summer < 2,500" seasonal traffic trend values were used to derive seasonal adjustment factors. Table 7 summarizes the average values for seasonal traffic trends during the count months (April and June) and the peak period as provided in the ODOT Seasonal Trend Table.

Table 7. Seasonal Adjustment Factors for US 30

Trend	1-Apr	15-Apr	1-Jun	15-Jun	ODOT Peak Period Seasonal Factor
Summer < 2,500	1.0362	0.9932	0.8936	0.8650	0.8089
Average	1.0147		0.8793		

Based on the data in Table 7, the traffic counts at all other study intersections were adjusted by the following factors, by count month:

- April: (1.015/0.809) = 1.25
- June: (0.879/0.809) = 1.09

ANALYSIS MODEL PARAMETERS

The bullets below identify the proposed sources of data and methodologies to be used to analyze traffic conditions in The Dalles. Analyses of all state facilities will be conducted according to the most-recent version of the APM, unless otherwise agreed upon by both ODOT's Transportation Planning and Analysis Unit (TPAU) and the consultant team.

1. *Intersection/Roadway Geometry* (lane numbers and arrangements, cross-section elements, signal phasing, etc.) will be verified for consistency with previous work efforts, reviewed through aerial photography, and confirmed through a site visit. Available as-built data may also be used to verify existing roadway geometry. The analysis models will be built on scaled roadway line work from GIS or aerial photography. ODOT's two-way stop-controlled intersection calculator tool will be used to calculate expected queue lengths for two-way stop-controlled intersections.

2. *Operational Data* (such as posted speeds, intersection control, parking, right-turn on red, etc.) will be field verified. Data will be reviewed during a site visit and supplemented by available GIS data, aerials, photos, and the ODOT Video Log.

3. *Peak Hour Factors* (PHF) will be calculated for each intersection and applied to the existing conditions analyses. PHFs of 0.95 will be used for the future analysis for high-order facilities (arterials), with 0.90 applied to medium-order facilities (collectors) and 0.85 applied to local roads. If the existing PHF is greater than these default future values, the existing PHF will be applied.

TRAFFIC ANALYSIS SOFTWARE AND INPUT ASSUMPTIONS

Synchro 9 software will be used for the intersection analysis. *Highway Capacity Manual* (HCM) 2000 models will be applied for signalized analysis and HCM 2010 models will be applied for unsignalized (stop-controlled) analysis per ODOT requirements. The existing roundabout and any future roundabouts will be analyzed using HCM 2010 models in Excel or Sidra.

Signal timing parameters for the signalized intersections will be obtained from ODOT Region 4 and are reflected in the Synchro model.

The reported results will include level of service, intersection delay, v/c ratios, and 95th percentile queue lengths generated by the HCM report. Analysis assumptions are listed in Table 8.

Table 8. Operations Parameters/Assumptions

Arterial Intersection Parameters	Existing Conditions
Peak Hour Factor	By region and intersection from traffic counts
Conflicting Bikes and Pedestrian per Hour	From traffic counts, as available
Ideal Saturation Flow Rate (for all movements)	1,750 passenger cars per hour green per lane
Lane Width	12 feet unless field observations determine otherwise
Percent Heavy Vehicles	From traffic counts by movement, as available
Bus Blockages	None
95th percentile vehicle queues	Synchro HCM summary output

CRASH ANALYSES

The most-recent five-year period of crash data (November 1, 2009 through October 31, 2014) will be reviewed at the study intersections. Any state highways in The Dalles that are identified as a Safety Priority Index System sites (top 5- or 10-percent) will be included in the crash data. The data will be analyzed for a variety of factors to include type, severity, general conditions, and location to identify potential crash patterns or anomalies. Additional details will be provided on citywide crash trends and any issues that are identified through the overall review at the corridor/segment and intersection level, and will include specific details on fatalities and crashes involving pedestrians and bicyclists.

Study intersection crash rates and critical crash rates will be calculated based on the method outlined in Part B of the *Highway Safety Manual*. If a critical crash rate cannot be calculated due to limited data, the published 90th percentile rates in Table 4-1 of ODOT's APM will be used for comparisons purposes. Project-area K-factors from 12+ hour counts will be used to convert short duration counts to daily traffic approach volumes.

For all areas that exceed the critical crash rate or 90th percentile rate, we will identify and present crash patterns and potential projects, policies, or studies that could address reported crash types and patterns. Countermeasures suggested for mitigation will be identified as having crash reduction potential based on Crash Modification Factors from the *Highway Safety Manual* or FHWA's online

Crash Modification Factor (CMF) Clearinghouse with a star rating of 3 or better. All CMFs must have consistent volumes/parameters as the study intersections.

FORECAST YEAR VOLUME DEVELOPMENT

Future no-build traffic volumes will be generated by The Dalles 2035 Travel Demand Model being prepared by ODOT's Transportation Planning Analysis Unit (TPAU). The model output data will be post-processed using NCHRP Report 255 methodologies.

NON-AUTOMOBILE TRANSPORTATION ANALYSIS

Per the scope, the non-automobile transportation analysis will include a review of collector and arterial roadways to identify deficiencies (availability of sidewalks and bicycle lanes, and gaps in primary routes) based on available GIS data and online mapping.

Quantitative and qualitative analysis of primary non-motorized transportation on collector and arterial roadways will include:

1. Bicycle Level of Traffic Stress as per Agency's *Analysis Procedure Manual v2*
2. Qualitative (multimodal) Assessment for pedestrian and transit modes per Agency's *Analysis Procedure Manual v2*.
3. A qualitative assessment of transit service and identification of underserved areas.
4. Gaps in intermodal connectivity.

NEXT STEPS

Please review the information presented in this memorandum and let us know if you have any questions, comments, or alternative direction. We look forward to working with you as the TSP Update process moves forward.

Appendix 1 On-site ATR Characteristics

Highway Approach	Closest ATR	Method	Trend	Seasonal adjustment	
				June	April
US 197	33-005	On-Site ATR Method		1.15	x
I-84 On- and Off-ramps	33-001	On-Site ATR Method		1.09	x
I-84 On- and Off-ramps	22-013	ATR Characteristic Table Method	Summer, Small urban fringe	1.07	x
I-84 On- and Off-ramps	17-001	On-Site ATR Method		1.07	x
US 30		Seasonal Characteristics	Summer < 2,500	1.07	x
City Streets		Seasonal Characteristics	Summer < 2,500	1.09	1.25

Seasonal Adjustment Factor (ATR #33-005)

Year	2009	2010	2011	2012	2013
Peak Month (August)	124%	123%	130%	129%	119%
Count Month (June)	111%	110%	108%	107%	109%

Average monthly factors
Peak month average: (124% + 123% + 129%) / 3 = 125.3%
Count month average: (110% + 108% + 109%) / 3 = 109%
Seasonal adjustment factors: 125.3 / 109 = 1.15

Seasonal Adjustment Factor (ATR #33-001)

Year	2009	2010	2011	2012	2013
Peak Month (July)	123%	124%	124%	124%	124%
Count Month (June)	114%	114%	111%	113%	114%

Average monthly factors
Peak month average: (124% + 124% + 124%) / 3 = 124%
Count month average: (114% + 113% + 114%) / 3 = 113.7%
Seasonal adjustment: 124 / 113.7 = 1.09

Seasonal Adjustment Factor (ATR #17-001)

Year	2009	2010	2011	2012	2013
Peak Month (July)	120%	122%	118%	117%	121%
Count Month (June)	109%	113%	112%	113%	112%

Average monthly factors
Peak month average: (120% + 118% + 121%) / 3 = 120%
Count month average: (112% + 113% + 112%) / 3 = 112%
Seasonal adjustment: 120 / 112 = 1.07

ATR 17-001 is located near Grant's Pass (I-5, PACIFIC HIGHWAY, 2.08 MILES SOUTH OF MONUME
Its AADT is in a 10% range of our data

Appendix B Inventory of City Roadways

Street Name	Ownership	Number of	Paved Wid	Right-of-W	Bicycle Facilities	Sidewalk
W 6TH ST	City	3	62	108	Existing Bike Facility	1
HOSTETLER ST W	County	2	36	47	Existing Bike Lane	0
W 3RD PL	City	3	36	50	Proposed Bike Lane	2
RIVER RD	County	2	33	60	Existing Bike Lane	0
W 2ND ST	City	2	48	100	Existing Bike Lane	1
WEBBER ST	City	2	44	60	Existing Bike Lane	2
W 10TH ST	County	2	45	56	Existing Bike Lane	1
MOUNT HOOD ST	City	2	42	60	Proposed Bike Lane	2
W 10TH ST	City	2	36	60	Shared Roadway	2
DRY HOLLOW RD	City	2	36	80	Existing Bike Lane	1
W 1ST ST	City	2	28	100	Riverfront Trail	1
THOMPSON ST	City	2	25	60	Shared Roadway	0
OLD DUFUR RD N	City	2	30	60	Proposed Shoulder Bikeway	0
HWY 30	State	2	36	70	Shoulder Bikeway	0
BREWERY OVERPASS	State	2	30	136	Proposed Bike Lane	0
E 1ST ST	City	1	28	42	Shared Roadway	0
E 2ND ST	City	2	40	60	Shared Roadway	2
E 3RD ST	City	2	42	60	Shared Roadway	2
E 4TH ST	City	2	37	60	Shared Roadway	2
UNION ST	City	2	40	60	Shared Roadway	2
COURT ST	City	2	48	78	Shared Roadway	2
E 12TH ST	City	2	37	46	Shared Roadway	2
SNIPES ST W	County	2	44	60	Existing Bike Lane	1
WALNUT ST W	County	2	32	58	No	0
CHERRY HEIGHTS RD W	City	2	44	80	Existing Bike Lane	2
W 6TH ST	City	2	20	60	Proposed Bike Lane	2
W 2ND ST	City	2	50	98	Existing Bike Lane	1
E 2ND ST	County	2	24	60	Shared Roadway	0
HWY 197	State	3	48	200	Shoulder Bikeway	0
KELLY AVE	City	2	36	60	Proposed Bike Lane	2

Appendix C ODOT Bridge Inventory

City of The Dalles
Transportation System Plan

Bridge Inventory – Summary of Bridge Conditions

Oregon's bridge inspection program collects bridge condition ratings for a number of National Bridge Inventory (NBI) Categories. These ratings indicate the level of deterioration in each element. General condition ratings for listed bridges generally range from six to eight. This indicates that the bridge inventory is in satisfactory, good, or very good condition, with structural elements showing minor to no deterioration.

It is important to note that general condition ratings provide an indication of each elements status relative to its original condition, not its suitability for use today. This suitability is communicated via a structure's Sufficiency Rating (SR). Sufficiency Rating is essentially an overall rating of a bridge's fitness for the duty that it performs. Sufficiency Ratings are based on factors derived from numerous NBI data fields. These data fields are grouped into four categories, Structural Adequacy and Safety, Serviceability and Functional Obsolescence, Essentiality for Public Use, and Special Reductions.

The following structures have been selected from the bridge inventory due to low sufficiency ratings.

Structure Number 00464 Mill Creek, W 6th Street SR 48.9

This structure is owned by the City of The Dalles.

General condition ratings indicate this structure is in satisfactory condition. The structure's low sufficiency rating can be attributed to a number of items, including Inventory Rating and Deck Geometry.

The structure has an Inventory Rating of 17.00 tons and is load restricted, primarily due to deficient negative moment capacities at interior bents. Increasing the structure's Inventory Rating would remove barriers to freight and open this corridor to larger vehicles. In addition, increasing the Inventory Rating to a minimum of 32.4 tons represents a nearly twenty point increase in the structure's Sufficiency Rating. The Inventory Rating can be readily increases via removal of the dead load (3" asphalt wearing surface", strengthening, or a combination of the two.

The bridge inspection report indicates the bridge has a bridge roadway width of 20.20 feet, substandard for a two lane structure. This structure is likely historic due to its age and type, limiting the corrective actions available.

Structure Number 07553 Chenoweth Creek, Hwy 2 SR 64.1

This structure is owned by the Oregon Department of Transportation (ODOT).

No work has been proposed for this structure.

Structure Number 08276 Hwy 2 over Hostetler Way Conn SR 57.8

This structure is owned by the Oregon Department of Transportation (ODOT).

No work has been proposed for this structure.

Structure Number 08804 Hwy 2 Brewery Grade Conn over UPRR SR 57.3

This structure is owned by the Oregon Department of Transportation (ODOT).

No work has been proposed for this structure.

Structure Number 00506 Chenoweth Creek, Hwy 100 SR 38.2

This structure is owned by the Oregon Department of Transportation (ODOT).

This structure is programmed for replacement during the 2015-2018 Statewide Transportation Improvement Program (STIP) as a portion of the US30: Mosier Creek & Dry Canyon Creek & Chenoweth Creek Bridges Project. The current project estimate is $3,797,000.

Structure Number 06635Q Columbia River, Hwy 4 (The Dalles) SR 33.4

This structure is owned by the Oregon Department of Transportation (ODOT).

A deck replacement project has been desk scoped for this structure. The scope of work also includes minor modifications to structural elements and minor painting. The current project estimate is $23,500,000.

25 Structures within The Dalles City Limits

Source: ODOT Bridge Working Database (10/20/2015) & ODOT GIS layers as of 10/29/2014 (The Dalles City Limits), 7/28/2015 (Fed. Aid Boundary)

BRIDGE_ID	STRUCNAME	MP	Carries	Crosses	YEARBUILT	Length (ft)	DESIGNMAIN	MATERIALMAIN	CUSTODIAN	NBISLEN	DKRATING	SUPRATING	SUBRATING	CULVRATING	SUFF_RATE
00463	Mill Creek, W 9th St	1.03	W 9TH STREET	MILL CREEK	1987	99.0	5 Prestressed Concrete	02 Stringer/Girder	CTY/MUN Hwy AGCY	Y	6	7	6	N	97.9
00464	Mill Creek, W 6th St	0.59	W 6TH STREET	MILL CREEK	1920	127.0	2 Concrete Continuous	02 Stringer/Girder	CTY/MUN Hwy AGCY	Y	6	6	6	N	48.9
02103	Mill Creek, Hwy 292 & 2nd St (The Dalles)	84.49	I-84 (HWY 002)	MILL CREEK	1938	16.0	1 Concrete	19 Culvert	State Highway Agency	N	N	N	N	5	89
06635	Hwy 4 over UPRR & Frontage Rd	0.76	US 197 (HWY 004)	UPRR & FRONTAGE RD	1954	553.0	4 Steel Continuous	03 Girder-Floorbeam	State Highway Agency	Y	6	6	7	N	72.7
07553	Chenoweth Creek, Hwy 2	81.89	I-84 (HWY 002)	CHENOWETH CREEK	1954	150.0	2 Concrete Continuous	02 Stringer/Girder	State Highway Agency	Y	7	6	7	N	64.1
07719	Gooseberry Spring, Hwy 2	81.18	I-84 (HWY 002) EB	GOOSEBERRY SPRING	1954	6.0	1 Concrete	19 Culvert	State Highway Agency	N	N	N	N	6	82.2
08276	Hwy 2 over Hostetler Way Conn	82.62	I-84 (HWY 002)	HOSTELLER WAY	1957	144.0	2 Concrete Continuous	02 Stringer/Girder	State Highway Agency	Y	7	6	7	N	57.8
08526	Hwy 4 over Hwy 2	0.64	US 197 (HWY 004)	HWY 002	1964	211.0	2 Concrete Continuous	05 Multiple Box Beam	State Highway Agency	Y	7	6	7	N	71.1
08603	Hwy 2 EB over UPRR	84.28	I-84 (HWY 002) EB	UPRR	1964	283.0	3 Steel	02 Stringer/Girder	State Highway Agency	Y	7	6	6	N	86
08603W	Hwy 2 WB over UPRR	84.28	I-84 (HWY 002) WB	UPRR	1964	309.0	3 Steel	02 Stringer/Girder	State Highway Agency	Y	6	6	6	N	73.9
08644	Threemile Creek, Hwy 4 at MP 0.99	0.99	US 197 (HWY 004)	THREEMILE CREEK	1959	10.0	1 Concrete	19 Culvert	State Highway Agency	N	N	N	N	6	84.3
08645	Threemile Creek, Hwy 4 at MP 1.22	1.22	US 197 (HWY 004)	THREEMILE CREEK	1959	10.0	1 Concrete	19 Culvert	State Highway Agency	N	N	N	N	6	83.7
08775	Hwy 2 over Hwy 292 at MP 84.15	84.15	I-84 (HWY 002)	HWY 292 O-XING	1964	454.0	4 Steel Continuous	02 Stringer/Girder	State Highway Agency	Y	6	6	6	N	94
08776	Hwy 2 over UPRR	87.45	I-84 (HWY 002)	UPRR	1964	640.0	4 Steel Continuous	02 Stringer/Girder	State Highway Agency	Y	6	6	6	N	95
08804	Hwy 2 Brewery Grade Conn over UPRR & I	85.64	BREWERY GRADE	UPRR & HWY 292 FR	1964	611.0	3 Steel	02 Stringer/Girder	State Highway Agency	Y	7	7	7	N	57.3
08805	Brewery Grade Conn over Hwy 2	85.51	BREWERY GRADE	I-84 (HWY 002)	1964	182.0	5 Prestressed Concrete	02 Stringer/Girder	State Highway Agency	Y	7	8	7	N	76
09192	Three Mile Creek, Hwy 2	86.83	I-84 (HWY 002)	THREE MILE CREEK	1964	14.0	1 Concrete	19 Culvert	State Highway Agency	N	N	N	N	6	76.1
0P139	Culvert, Hwy 2 at MP 82.62	83.55	I-84 (HWY 002)	CREEK	1957	6.0	3 Steel	19 Culvert	State Highway Agency	N	N	N	N	8	83
16010	Mill Creek, W 10th St	0	W 10TH STREET	MILL CREEK	1975	112.0	5 Prestressed Concrete	02 Stringer/Girder	CTY/MUN Hwy AGCY	Y	6	7	7	N	97.5
18153	Hwy 2 River Rd Conn over Hwy 2 (Chenow	82.07	RIVER RD	I-84 (HWY 002)	1997	182.0	5 Prestressed Concrete	05 Multiple Box Beam	State Highway Agency	Y	7	7	6	N	93.8
18154	Hwy 2 River Rd Conn over UPRR (Chenow	82.12	RIVER RD	UPRR	1998	105.5	1 Concrete	05 Multiple Box Beam	State Highway Agency	Y	6	6	8	N	97
19152	Three Mile Creek, Hwy 100	20.2	HWY 100	THREE MILE CREEK	2003	20.6	3 Steel	19 Culvert	State Highway Agency	Y	N	N	N	8	83.3
19156	Hwy 2 over Union St (The Dalles)	84.78	I-84 (HWY 002)	UNION STREET	2003	74.1	6 P/S Conc Continuous	07 Frame	State Highway Agency	Y	7	8	8	N	92.3
19745	Hwy 2 over Hwy 292 at MP 83.67	83.67	I-84 (HWY 002)	US 30 (HWY 292)	2005	170.0	5 Prestressed Concrete	01 Slab	State Highway Agency	Y	7	8	8	N	94
21472	Chenoweth Creek, River Trail Way	1.98	RIVER TRAIL WAY	CHENOWETH CREEK	2009	115.0	5 Prestressed Concrete	05 Multiple Box Beam	County Hwy Agency	Y	8	7	8	N	98.8

5 structures not within The Dalles city limits, but within Federal Aid Urban Boundary

Source: ODOT Bridge Working Database (10/20/2015) & ODOT GIS layers as of 10/29/2014 (The Dalles City Limits), 7/28/2015 (Fed. Aid Boundary

BRIDGE_ID	STRUCNAME	MP	Carries	Crosses	YEARBUILT	Length (ft)	DESIGNMAIN	MATERIALMAIN	CUSTODIAN	NBISLEN	DKRATING	SUPRATING	SUBRATING	CULVRATING	SUFF_RATE
00506	Chenoweth Creek, Hwy 100	72.1	HWY 100	CHENOWETH CREEK	1920	66.0	2 Concrete Continuous	02 Stringer/Girder	State Highway Agency	Y	6	5	5	N	38.2
06635Q	Columbia River, Hwy 4 (The Dalles)	0	US 197 (HWY 004)	COLUMBIA RIVER	1954	3345.0	4 Steel Continuous	10 Truss-Thru	State Highway Agency	Y	5	5	6	N	33.4
07550	Hwy 2 over Taylor-Frantz Rd Conn	80.79	I-84 (HWY 002)	TAYLOR-FRANTZ RD	1954	92.0	2 Concrete Continuous	02 Stringer/Girder							
08646	Equipment Pass, Hwy 4 at MP 1.84	1.84	US 197 (HWY 004)	EQUIPMENT PASS	1959	13.0	1 Concrete	01 Slab	State Highway Agency	N	7	7	7	N	94
09211	Chenoweth Creek, W 10th St	3.41	W 10TH STREET	CHENOWETH CREEK	1965	99.0	2 Concrete Continuous	01 Slab	County Hwy Agency	Y	7	7	5	N	84.3

Appendix D Environmental Justice Maps and Tables

Environmental Justice Maps and Tables

Minority Groups

Overall, The Dalles is less diverse compared to the State of Oregon or Wasco County. As seen in Table D-1, a greater percentage of the population is white within The Dalles (80%) compared to the state and county (78% and 77% respectively). Hispanic or Latino populations comprise of the second largest population with 16% of The Dalles population, which is comparable to Wasco County (16%) and greater than the state (12%). Even though The Dalles has a greater percentage of Hispanic or Latino population compared to the state, all other minority populations are below state average.

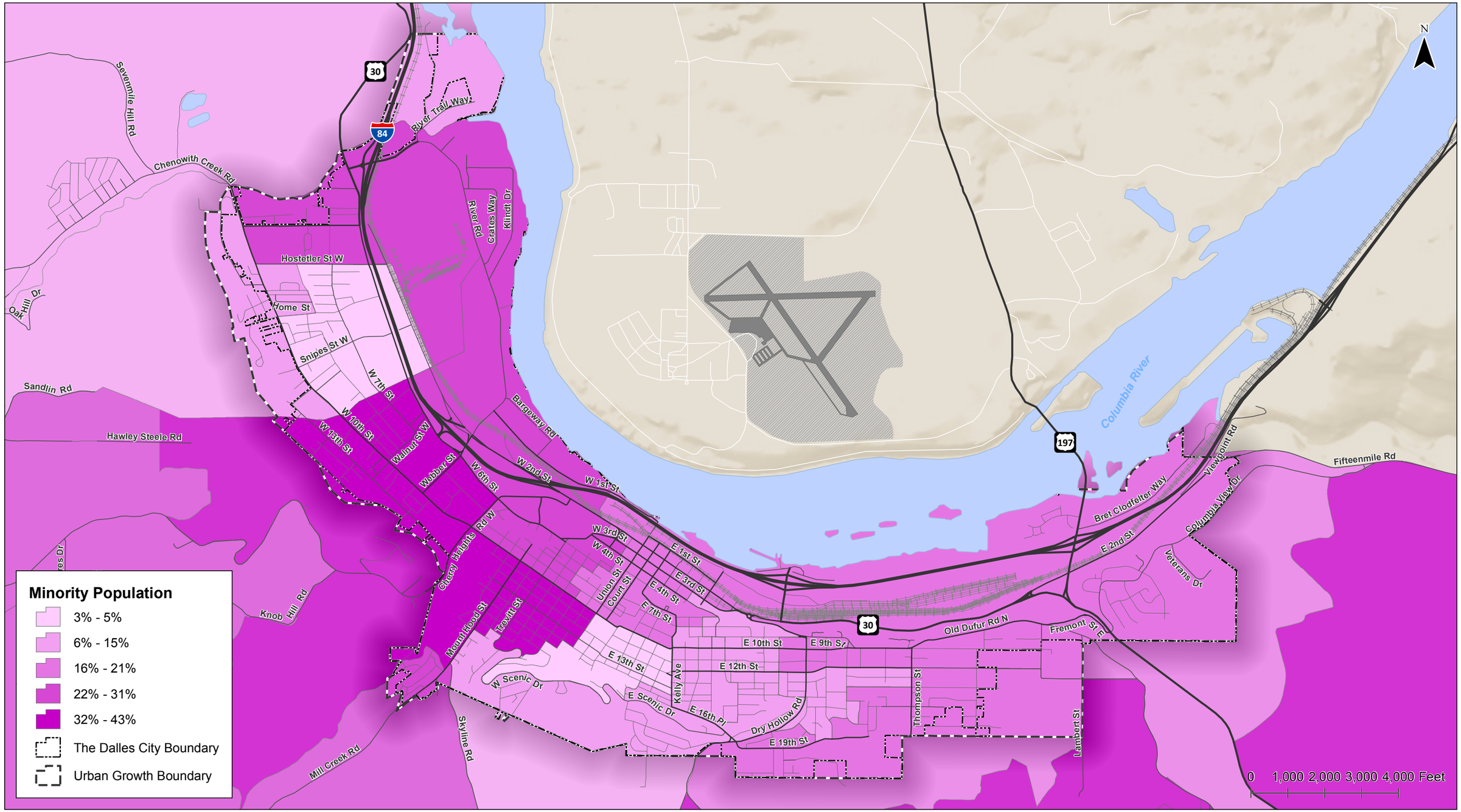
Minority populations are generally located in low-density residential neighborhoods outside of The Dalles' city center (see Figure D-1).

Table D-1. Minority Groups [6]

Geography	Oregon			Wasco County			The Dalles		
	Estimate	%	MOE	Estimate	%	MOE	Estimate	%	MOE
Total	3,868,721			25,281			14,730		41
Not Hispanic or Latino	3,406,820	88%	**	21,344	84%	**	12,436	84%	292
White alone	3,018,414	78%	942	19454	77%	19	11,807	80%	308
Black or African American alone	66,223	2%	1,496	98	0%	60	33	0%	30
American Indian and Alaska Native alone	37,750	1%	1,184	1,068	4%	117	256	2%	135
Asian alone	145,830	4%	1,626	248	1%	51	63	0%	60
Native Hawaiian and Other Pacific Islander alone	14,572	0%	580	157	1%	27	97	1%	61
Some other race alone	6,049	0%	1,064	0	0%	22	0	0%	19
Two or more races	117,982	3%	2,614	319	1%	319	180	1%	92
Hispanic or Latino	461,901	12%	**	3,937	16%	**	2,294	16%	290

* MOE = Margin of Error for the population
**Estimate is controlled. A statistical test for sampling variability is not appropriate

[6] 2013 ACS 5-Year Estimates, Table B03002



Percent of Minority Population (by block group)
The Dalles, Oregon

Figure
D-1

Coordinate System: NAD 1983 StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: Wasco County, 2013 ACS 5-Year Estimate
Sources: Esri, USGS, NOAA

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Low-Income

The American Community Survey (ACS) uses the income-to-poverty ratio as a measure of poverty. This includes the population in households where the household income is less than or equal to twice the federal "poverty level."[7] A greater portion of the population falls in this definition of poverty (43%) compared to the State of Oregon (36%) (see Table D-2).

Households with an income-to-poverty ratio of 1.99 or below are widely distributed in residential zones throughout the City. Notable areas include census blocks around the city center and in the western and northwestern area of the UGB (see Figure D-2)[8].

Table D-2 – Ratio of Income to Poverty Level [9]

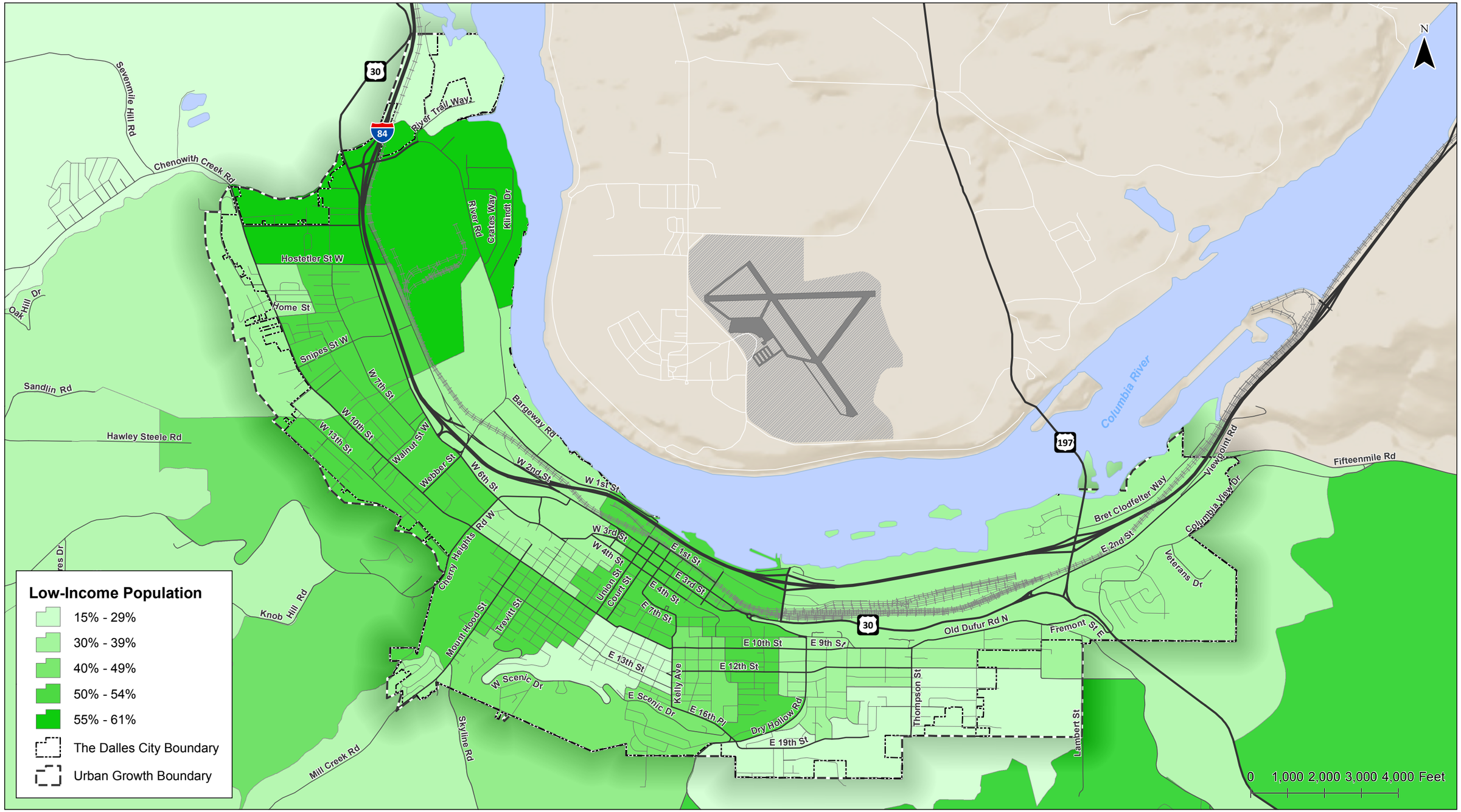
Geography	Oregon			Wasco County			The Dalles		
	Estimate	%	MOE	Estimate	%	MOE	Estimate	%	MOE
Total	3,793,058	100%	1,282	24,750	100%	168	14,264	100%	156
Under 1.99	1,374,319	36%	14,519	10,937	44%	1,082	6,179	43%	886
Under .50	275,594	7%	5,991	2,350	9%	550	1,302	9%	468
.50 to .99	339,184	9%	7,895	2,152	9%	437	853	6%	270
1.00 to 1.24	189,859	5%	5,567	1,757	7%	445	1,070	8%	376
1.25 to 1.49	193,875	5%	4,656	1,745	7%	451	1,048	7%	372
1.50 to 1.84	271,789	7%	6,769	1,770	7%	402	1,090	8%	346
1.85 to 1.99	104,018	3%	3,752	1,163	5%	337	816	6%	306
2.00 and over	2,418,739	64%	13,006	13,813	56%	672	8,085	57%	607

MOE = Margin of Error

[7] U.S. Census Poverty Definitions

[8] Note that the Chenoweth industrial area registers with the highest portion of low-income population, however it is one of the least populated areas within the UGB.

[9] 2013 ACS 5-Year Estimates, Table C17002



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Percent of Population with Ratio of Income to Poverty Level 1.99 or Below (by block group)
The Dalles, Oregon

Figure
D-2

Oregon Department of Transportation
Kittelson & Associates, Inc. Transportation Engineering/Planning

Coordinate System: NAD 1983 StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: Wasco County, 2013 ACS 5-Year Estimate
Sources: Esri, USGS, NOAA

Person 65 Years and Older

Nearly 1 in 5 people in The Dalles are 65 years of age or older (19%) as seen in Table D-3. This is approximately the same as Wasco County (18%), and represents a greater portion of seniors as compared to the State of Oregon (14%). People 65 years of age or older are generally located within the western and southern areas with the UGB. These areas are typically zoned as low-density residential neighborhoods outside of the city center (see Figure D-3).[10]

Table D-3 – Persons 65 Years and Older [11]

	Oregon			Wasco County			The Dalles		
	Estimate	%	MOE	Estimate	%	MOE	Estimate	%	MOE
Total Population	3,868,721			25,281			14,730		
Person 65 & Older	560,073	14%	3,745	4,570	18%	274	2,866	19%	261

MOE = Margin of Error

Persons 17 Years and Younger

Nearly 1 in 4 people in The Dalles are 17 years of age or younger (25%), as seen in Table D-4. This is a greater portion of youth compared to Wasco County (23%) and the State of Oregon (22%). These populations are heavily concentrated in two census blocks as seen in Figure D-4. The census blocks with the highest concentration of youth are also among the most densely populated census blocks within the UGB.

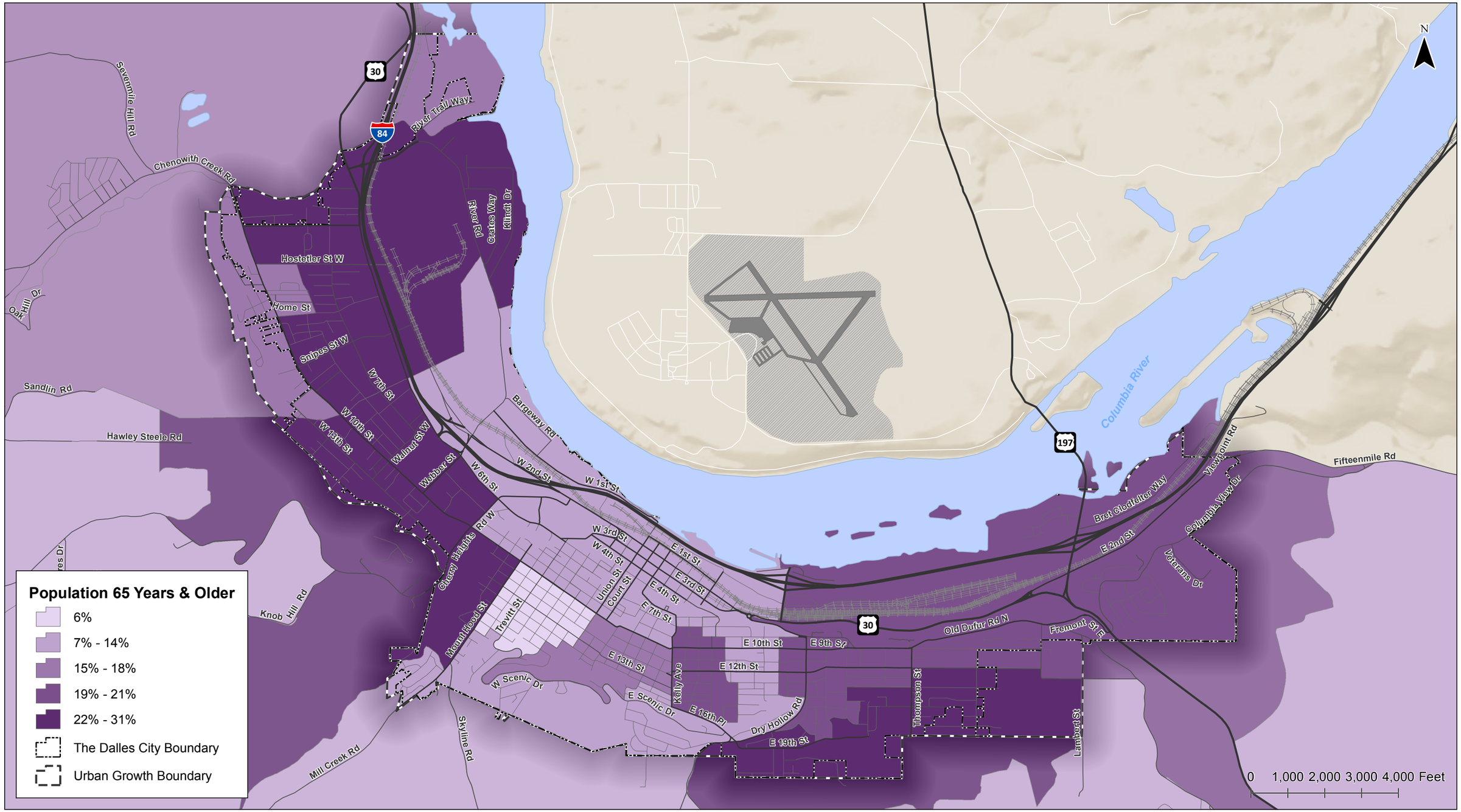
Table D-4 – Persons 17 Years and Younger[11]

	Oregon			Wasco County			The Dalles		
	Estimate	%	MOE	Estimate	%	MOE	Estimate	%	MOE
Total Population	3,868,721			25,281			14,730		
Persons 17 Or Younger	862,288	22%	3,894	5,729	23%	275	3,700	25%	292

MOE = Margin of Error

[10] Note that the Chenoweth industrial area registers with a high percentage of population 65 and older, however it is also one the least populated areas within the UGB.

[11] 2013 ACS 5-Year Estimates, Table B01001



Percent of Population 65 Years of Age and Older (by block group)
The Dalles, Oregon

Figure
D-3

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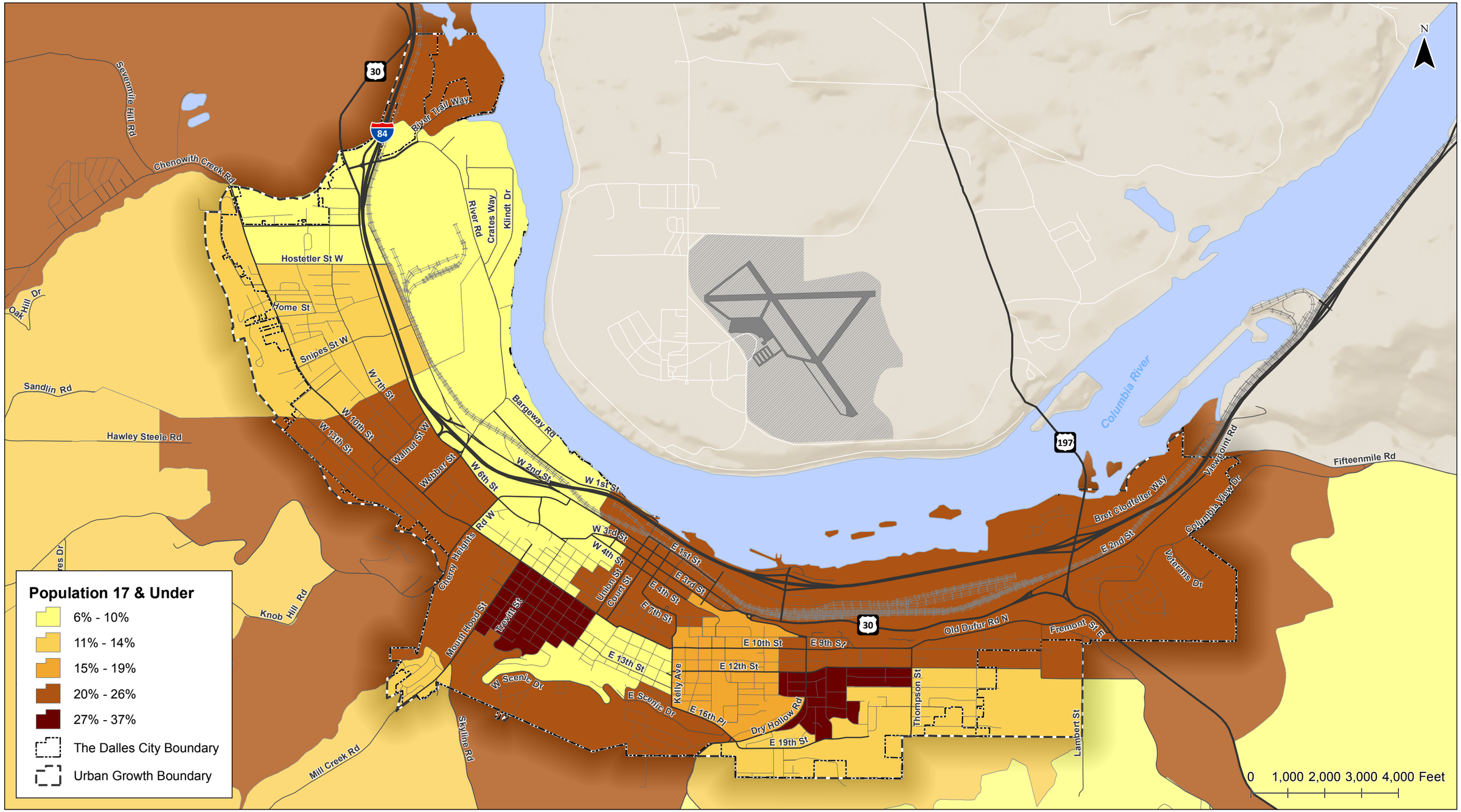
Oregon Department of Transportation
Kittelson & Associates, Inc. Transportation Engineering/Planning
APG

Coordinate System: NAD 1983 StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: Wasco County, 2013 ACS 5-Year Estimate
Sources: Esri, USGS, NOAA



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Percent of Population 17 Years of Age and Younger (by block group)
The Dalles, Oregon

Figure
D-4

Oregon Department of Transportation

KITTELSON & ASSOCIATES, INC. TRANSPORTATION ENGINEERING/PLANNING

APG

Coordinate System: NAD 1983 StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: Wasco County, 2013 ACS 5-Year Estimate
Sources: Esri, USGS, NOAA

Limited-English Proficiency

The location and number of households with limited-English proficiency is difficult to determine solely based on ACS 5-Year Estimates due to the small sampling size and large margin of error. The available data, shown in Table D-5, estimates 1% of households within The Dalles have limited-English proficiency. Among those, it is likely that people within the household speak only Spanish. Planning for transportation improvements will need to take into account the possibility of unique transportation needs related to access to services and multi-modal transportation.

Table D-5 – Non-English Proficiency [12]

Geography	Oregon			Wasco County			The Dalles		
	Estimate	%	MOE	Estimate	%	MOE	Estimate	%	MOE
Total Households	1,516,456	100%	4,721	9,612	100%	296	6,056	100%	204
English only	1,297,866	86%	4,514	8,416	88%	311	5,304	88%	259
Limited English Proficiency	44,675	3%	1,661	157	2%	79	93	1%	69
Spanish	26,628	2%	1,391	148	2%	75	88	1%	63
Other Indo-European languages	5,337	0%	475	-	0%	22	-	0%	19
Asian and Pacific Island languages	11,291	1%	724	5	0%	9	5	0%	9
Other languages	1,419	0%	272	4	0%	8	-	0%	19

MOE = Margin of Error

Persons with Disabilities

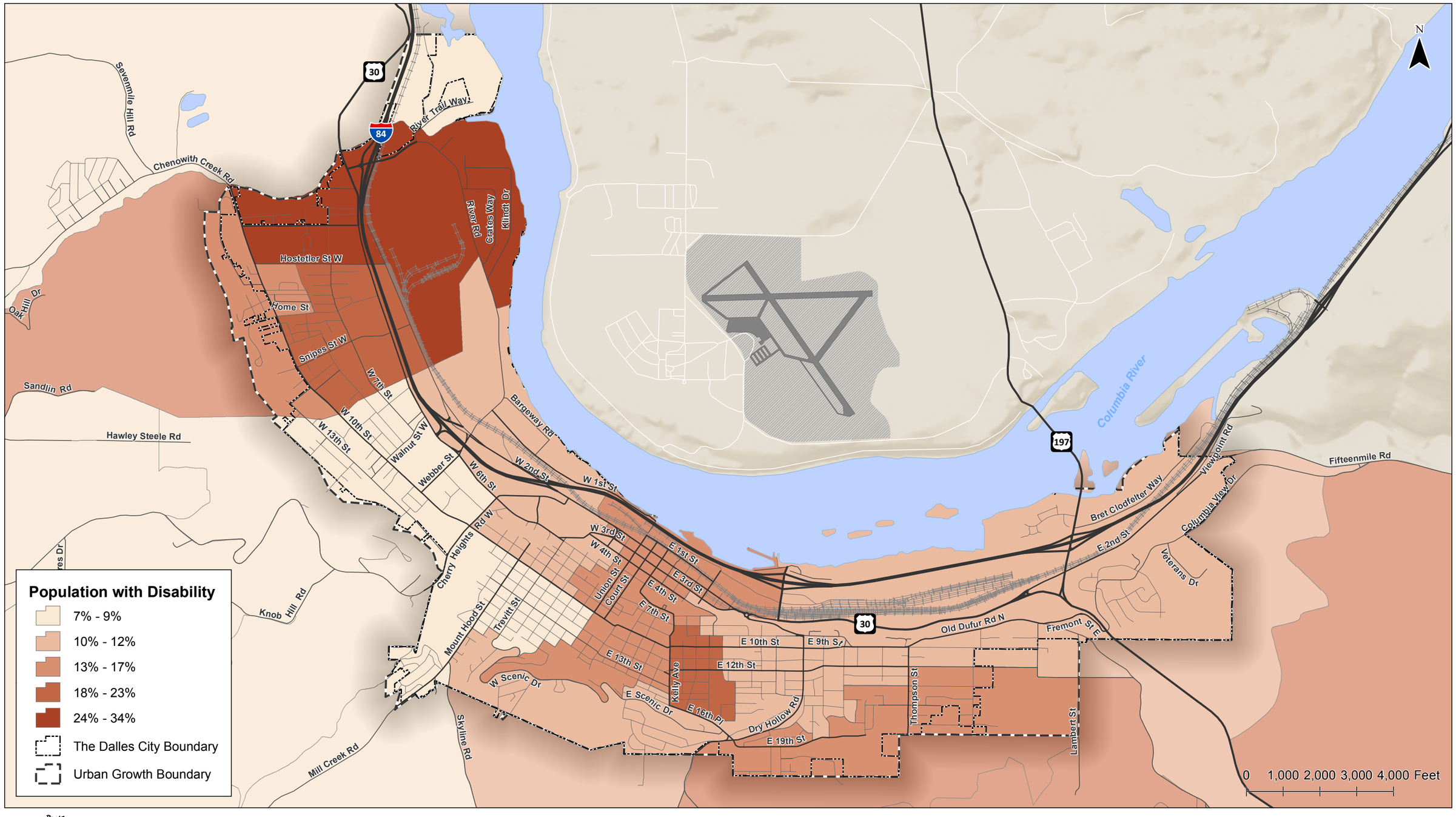
The percent population with disabilities in The Dalles (13%) is similar to the State of Oregon (12%) and Wasco County (13%) as seen in Table D-6. The northwestern area of the UGB and central area south of the city center tend to have a higher concentration of populations with disabilities (see Figure D-5). Note that the census block with the highest percentage of population with disabilities also has the lowest total population and population density. Even taking this into consideration as an outlier, some of the adjacent block groups also have a high percentage of population with disabilities.

Table D-6 – Persons with Disabilities [13]

Geography	Oregon			Wasco County			The Dalles		
	Population Estimate	%	MOE	Population Estimate	%	MOE	Population Estimate	%	MOE
Total	2,545,953	100%	1,439	15,689	100%	108	8,612	100%	212
Total with a Disability	296,082	12%	4,458	2,076	13%	226	1,108	13%	186

MOE = Margin of Error

[12] 2013 ACS 5-Year Estimates, Table B16002
[13] 2013 ACS 5-Year Estimates, Table C23023



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Percent of Population with Disability (by block group)
The Dalles, Oregon

Figure
D-5

Oregon Department of Transportation
Kittelson & Associates, Inc. Transportation Engineering/Planning

Coordinate System: NAD 1983 StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: Wasco County, 2013 ACS 5-Year Estimate
Sources: Esri, USGS, NOAA

Appendix E Traffic Counts

File Name: Z:\NATHAN TMCS\2015\OR\FORMATTED\9398_-_7_Mile_&_Chenoweth_240733_06-09-2015.ppd
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Start Time: 2:00:00 PM
Site Code: 46023
Comment 1:
Comment 2:
Comment 3:
Comment 4:

	7 MILE HILL RD				CHENOWITH RD								CHENOWITH RD					
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	total	hourly total
02:00 PM	13	0	0	0	0	4	0	0	0	0	0	0	0	8	20	0	45	
02:15 PM	20	0	0	0	0	8	0	0	0	0	0	0	0	8	12	0	48	
02:30 PM	19	0	1	0	0	4	0	0	0	0	0	0	0	9	10	0	43	
02:45 PM	13	0	0	0	1	3	0	0	0	0	0	0	0	11	22	0	50	186
03:00 PM	11	0	1	0	0	8	0	0	0	0	0	0	0	8	16	0	44	185
03:15 PM	20	0	0	0	0	11	0	0	0	0	0	0	0	10	31	0	72	209
03:30 PM	13	0	1	0	0	8	0	0	0	0	0	0	0	9	19	0	50	216
03:45 PM	12	0	0	0	0	8	0	0	0	0	0	0	0	5	30	0	55	221
04:00 PM	20	0	0	0	1	7	0	0	0	0	0	0	0	10	27	0	65	242
04:15 PM	9	0	0	0	0	5	0	0	0	0	0	0	0	11	29	0	54	224
04:30 PM	22	0	1	0	0	6	0	0	0	0	0	0	0	11	28	0	68	242
04:45 PM	13	0	1	0	0	11	0	0	0	0	0	0	0	12	18	0	55	242
05:00 PM	20	0	1	0	0	8	0	0	0	0	0	0	0	18	34	0	81	258
05:15 PM	22	0	0	0	2	4	0	0	0	0	0	0	0	11	28	0	67	271
05:30 PM	16	0	1	0	1	8	0	0	0	0	0	0	0	9	18	0	53	256
05:45 PM	15	0	0	0	1	8	0	0	0	0	0	0	0	10	17	0	51	252

Southbound Vehicles			Westbound Vehicles			Northbound Vehicles			Eastbound Vehicles			Southbound HV %			Westbound HV %			Northbound HV %			Eastbound HV%		
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	SB LT	SB TH	SB RT	WB LT	WB TH	WB RT	NB LT	NB TH	NB RT	EB LT	EB TH	EB RT
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Start Date: 6/9/2015
Start Time: 2:00:00 PM
Site Code: 46022
Comment 1:
Comment 2:
Comment 3:
Comment 4:

	US 30 Southbound				RIVER RD Westbound				US 30 Northbound				Eastbound					
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	total	hourly total
02:00 PM	0	7	5	0	2	0	54	0	49	9	0	0	0	0	0	0	126	
02:15 PM	0	16	1	0	3	0	45	0	43	7	0	0	0	0	0	0	115	
02:30 PM	0	16	4	0	5	0	54	0	57	14	0	0	0	0	0	0	150	
02:45 PM	0	7	6	0	3	0	50	0	42	13	0	0	0	0	0	0	121	512
03:00 PM	0	11	5	0	4	0	61	0	46	10	0	0	0	0	0	0	137	523
03:15 PM	0	10	3	0	8	0	54	0	44	14	0	0	0	0	0	0	133	541
03:30 PM	0	15	5	0	3	0	71	0	68	12	0	0	0	0	0	0	174	565
03:45 PM	0	13	2	0	2	0	70	0	37	12	0	0	0	0	0	0	136	580
04:00 PM	0	8	7	0	6	0	84	0	50	10	0	0	0	0	0	0	165	608
04:15 PM	0	7	1	0	2	0	58	0	36	10	0	0	0	0	0	0	114	589
04:30 PM	0	5	5	0	3	0	75	0	34	12	0	0	0	0	0	0	134	549
04:45 PM	0	11	4	0	5	0	52	0	43	13	0	0	0	0	0	0	128	541
05:00 PM	0	12	3	0	5	0	87	0	51	8	0	0	0	0	0	0	166	542
05:15 PM	0	13	3	0	1	0	76	0	44	14	0	0	0	0	0	0	151	579
05:30 PM	0	33	12	0	3	0	61	0	40	13	0	0	0	0	0	0	162	607
05:45 PM	0	4	4	0	3	0	50	0	43	13	0	0	0	0	0	0	117	596

Southbound Vehicles			Westbound Vehicles			Northbound Vehicles			Eastbound Vehicles			Southbound HV %			Westbound HV %			Northbound HV %			Eastbound HV%		
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	SB LT	SB TH	SB RT	WB LT	WB TH	WB RT	NB LT	NB TH	NB RT	EB LT	EB TH	EB RT
15	41	0	290	0	14	0	47	172	0	0	0	6.7	0.0	#DIV/0!	4.1	#DIV/0!	0.0	#DIV/0!	2.1	5.8	#DIV/0!	#DIV/0!	#DIV/0!

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Site Code: 46022
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Comment 2:
Comment 3:
Comment 4:

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02:15 PM	22	0	5	0	0	22	4	0	0	0	0	0	10	34	0	0	97	
02:30 PM	30	0	5	0	0	29	4	0	0	0	0	0	12	51	0	0	131	
02:45 PM	34	0	5	0	0	23	8	0	0	0	0	0	17	31	0	0	118	460
03:00 PM	36	0	4	0	0	28	2	0	0	0	0	0	12	40	0	0	122	468
03:15 PM	40	0	5	0	0	22	3	0	0	0	0	0	16	34	0	0	120	491
03:30 PM	38	0	4	0	0	38	4	0	0	0	0	0	18	52	0	0	154	514
03:45 PM	45	1	3	0	0	24	4	0	0	0	0	0	7	31	0	0	115	511
04:00 PM	47	0	5	0	0	43	8	0	0	0	0	0	14	43	0	0	160	549
04:15 PM	46	1	10	0	0	21	2	0	0	0	0	0	14	22	0	0	116	545
04:30 PM	39	0	5	0	0	36	5	0	0	0	0	0	10	29	0	0	124	515
04:45 PM	32	1	1	0	0	22	1	0	0	0	0	0	13	34	0	0	104	504
05:00 PM	47	0	2	0	0	46	12	0	0	0	0	0	13	42	0	0	162	506
05:15 PM	52	0	5	0	0	28	6	0	0	0	0	0	15	36	0	0	142	532
05:30 PM	38	1	4	0	0	24	1	0	0	0	0	0	12	38	0	0	118	526
05:45 PM	26	0	4	0	0	24	5	0	0	0	0	0	12	33	0	0	104	526

Southbound Vehicles			Westbound Vehicles			Northbound Vehicles			Eastbound Vehicles			Southbound HV %			Westbound HV %			Northbound HV %			Eastbound HV%		
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	SB LT	SB TH	SB RT	WB LT	WB TH	WB RT	NB LT	NB TH	NB RT	EB LT	EB TH	EB RT
13	1	170	24	132	0	0	0	0	0	141	51	30.8	0.0	6.5	0.0	3.0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	5.7	5.9

File Name: Z:\NATHAN TMCS\2015\OR\FORMATTED\9398_-_84_WB_&_River_240748_06-09-2015.ppd
Start Date: 6/9/2015
Start Time: 6:00:00 AM
Site Code: 46003
Comment 1:
Comment 2:
Comment 3:
Comment 4:

	I-84 WB ON / OFF RAMPS				RIVER RD				I-84 WB ON / OFF RAMPS				RIVER RD				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
02:00 PM	0	0	0	0	4	13	0	0	2	0	11	0	0	11	30	0	71	
02:15 PM	0	0	0	0	5	9	0	0	3	0	20	0	0	10	25	0	72	
02:30 PM	0	0	0	0	1	11	0	0	1	1	22	0	0	18	41	0	95	
02:45 PM	0	0	0	0	3	20	0	0	1	0	11	0	0	10	24	0	69	307
03:00 PM	0	0	0	0	7	5	0	0	1	0	22	0	0	17	26	0	78	314
03:15 PM	0	0	0	0	4	13	0	0	5	0	14	0	0	16	25	0	77	319
03:30 PM	0	0	0	0	8	26	0	0	3	0	13	0	0	12	41	0	103	327
03:45 PM	0	0	0	0	7	16	0	0	5	1	13	0	0	8	29	0	79	337
04:00 PM	0	0	0	0	7	30	0	0	0	1	21	0	0	8	37	0	104	363
04:15 PM	0	0	0	0	4	14	0	0	0	0	5	0	0	16	17	0	56	342
04:30 PM	0	0	0	0	11	24	0	0	1	0	20	0	0	13	24	0	93	332
04:45 PM	0	0	0	0	10	13	0	0	2	0	12	0	0	4	29	0	70	323
05:00 PM	0	0	0	0	11	36	0	0	0	0	20	0	0	10	36	0	113	332
05:15 PM	0	0	0	0	11	15	0	0	0	0	17	0	0	7	30	0	80	356
05:30 PM	0	0	0	0	3	9	0	0	0	0	15	0	0	10	36	0	73	336
05:45 PM	0	0	0	0	6	11	0	0	0	0	19	0	0	10	27	0	73	339

Southbound Vehicles			Westbound Vehicles			Northbound Vehicles			Eastbound Vehicles			Southbound HV %			Westbound HV %			Northbound HV %			Eastbound HV%		
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	SB LT	SB TH	SB RT	WB LT	WB TH	WB RT	NB LT	NB TH	NB RT	EB LT	EB TH	EB RT
0	0	0	0	88	43	69	0	3	119	34	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.0	7.0	2.9	#DIV/0!	66.7	5.0	17.6	#DIV/0!

File Name: Z:\NATHAN TMCS\2015\OR\FORMATTED\9398_-_10th_&_Hostetler_240731_06-09-2015.ppd
Start Date: 6/9/2015
Start Time: 2:00:00 PM
Site Code: 46025
Comment 1:
Comment 2:
Comment 3:
Comment 4:

	10TH ST				HOSTETLER WAY				10TH ST									
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	total	hourly total
02:00 PM	0	21	1	0	3	0	2	0	6	26	0	0	0	1	0	0	60	
02:15 PM	0	36	3	0	2	0	4	0	11	24	0	0	0	0	0	0	80	
02:30 PM	0	23	3	0	4	0	5	0	4	30	0	0	0	0	0	0	69	
02:45 PM	0	16	1	0	5	0	3	0	10	27	0	0	0	0	0	0	62	271
03:00 PM	0	25	5	0	6	0	8	0	7	21	0	0	0	0	0	0	72	283
03:15 PM	0	34	5	0	10	0	6	0	6	35	0	0	0	0	0	0	96	299
03:30 PM	0	46	6	0	7	0	3	0	11	21	0	0	0	0	0	0	94	324
03:45 PM	0	25	5	0	4	0	7	0	9	36	0	0	0	0	0	0	86	348
04:00 PM	0	28	3	0	6	1	9	0	6	25	0	0	0	0	0	0	78	354
04:15 PM	0	23	4	0	6	0	3	0	4	23	0	0	0	1	0	0	64	322
04:30 PM	0	37	1	0	7	0	6	0	4	26	0	0	0	0	0	0	81	309
04:45 PM	0	30	3	0	4	1	3	0	10	33	0	0	0	1	0	0	85	308
05:00 PM	0	34	4	0	8	0	9	0	10	42	0	0	0	0	0	0	107	337
05:15 PM	0	23	6	0	4	0	5	0	8	34	0	0	0	0	0	0	80	353
05:30 PM	0	31	7	0	4	0	7	0	13	22	0	0	0	0	0	0	84	356
05:45 PM	0	25	10	0	6	0	15	0	8	24	0	0	0	0	0	0	88	359

Southbound Vehicles			Westbound Vehicles			Northbound Vehicles			Eastbound Vehicles			Southbound HV %			Westbound HV %			Northbound HV %			Eastbound HV%		
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	SB LT	SB TH	SB RT	WB LT	WB TH	WB RT	NB LT	NB TH	NB RT	EB LT	EB TH	EB RT
14	124	0	23	1	23	0	135	32	0	1	0	0.0	2.4	#DIV/0!	0.0	100.0	0.0	#DIV/0!	0.7	0.0	#DIV/0!	0.0	#DIV/0!

File Name: C:\Users\Clay\Documents\Work Documents\Clients\2015\ODOT\Jim Bryant\The Dalles\Regular TMC\Hostetler & 2nd.ppd
Start Date: 6/4/2015
Start Time: 2:00:00 PM
Site Code:
Comment 1:
Comment 2:
Comment 3:
Comment 4:

	2ND ST				HOSTETLER ST				2ND ST				HOSTETLER ST					
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	total	hourly total
14:00	0	0	2	0	0	2	0	0	28	0	2	0	0	0	17	0	51	
14:15	0	2	0	0	0	0	0	0	23	1	0	0	0	0	11	0	37	
14:30	0	3	1	0	0	0	0	0	24	1	1	0	0	1	17	0	48	
14:45	0	0	0	0	0	0	0	0	25	1	0	0	1	0	17	0	44	180
15:00	0	3	2	0	1	1	0	0	20	0	0	0	1	0	12	0	40	169
15:15	0	0	0	0	0	0	0	0	23	1	1	0	0	0	21	0	46	178
15:30	0	0	0	0	2	4	0	0	23	2	2	0	0	1	23	1	57	187
15:45	0	3	1	0	1	3	0	0	34	2	0	0	0	0	12	0	56	199
16:00	0	0	1	0	1	3	0	0	24	2	0	0	2	5	21	0	59	218
16:15	0	1	0	0	3	1	0	0	24	1	2	0	1	0	12	0	45	217
16:30	0	0	1	0	1	0	0	0	29	0	0	0	1	0	13	0	45	205
16:45	0	3	1	0	1	2	0	0	31	2	1	0	2	1	12	0	56	205
17:00	0	1	3	0	2	2	0	0	33	1	0	0	2	1	7	0	52	198
17:15	0	0	0	0	3	0	0	0	20	0	1	0	0	0	12	0	36	189
17:30	0	0	0	0	0	2	0	0	21	1	0	0	0	0	10	0	34	178
17:45	0	1	1	0	0	2	0	0	24	0	0	0	1	0	9	0	38	160

Southbound Vehicles			Westbound Vehicles			Northbound Vehicles			Eastbound Vehicles			Southbound HV %			Westbound HV %			Northbound HV %			Eastbound HV%		
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	SB LT	SB TH	SB RT	WB LT	WB TH	WB RT	NB LT	NB TH	NB RT	EB LT	EB TH	EB RT
0	4	5	7	4	0	113	3	2	5	2	44	#DIV/0!	0.0	0.0	0.0	0.0	#DIV/0!	0.0	0.0	0.0	0.0	50.0	0.0

File Name: Z:\NATHAN TMCS\2015\OR\FORMATTED\9398_-_Hwy_30_&_84_EB_240754_06-09-2015.ppd
Start Date: 6/10/2015
Start Time: 6:00:00 AM
Site Code: 46006
Comment 1:
Comment 2:
Comment 3:
Comment 4:

	US 30				I-84 EB RAMPS				US 30									
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	total	hourly total
02:00 PM	0	104	31	0	5	0	17	0	43	134	0	0	0	0	0	0	334	
02:15 PM	0	116	28	0	6	0	13	0	41	124	0	0	0	0	0	0	328	
02:30 PM	0	127	25	0	6	0	15	0	38	137	0	0	0	0	0	0	348	
02:45 PM	0	122	38	0	4	0	13	0	37	130	0	0	0	0	0	0	344	1354
03:00 PM	0	129	37	0	5	0	8	0	40	123	0	0	0	0	0	0	342	1362
03:15 PM	0	149	27	0	3	0	13	0	34	148	0	0	0	0	0	0	374	1408
03:30 PM	0	134	25	0	8	0	11	0	39	178	0	0	0	0	0	0	395	1455
03:45 PM	0	116	41	0	7	0	7	0	34	146	0	0	0	0	0	0	351	1462
04:00 PM	0	132	22	0	6	0	13	0	43	168	0	0	0	0	0	0	384	1504
04:15 PM	0	116	31	0	5	0	11	0	38	153	0	0	0	0	0	0	354	1484
04:30 PM	0	131	35	0	6	0	14	0	56	153	0	0	0	0	0	0	395	1484
04:45 PM	0	141	35	0	7	0	11	0	47	143	0	0	0	0	0	0	384	1517
05:00 PM	0	130	33	0	15	0	10	0	43	183	0	0	0	0	0	0	414	1547
05:15 PM	0	135	27	0	3	0	13	0	41	169	0	0	0	0	0	0	388	1581
05:30 PM	0	163	33	0	6	0	8	0	41	171	0	0	0	0	0	0	422	1608
05:45 PM	0	140	39	0	8	0	14	0	31	160	0	0	0	0	0	0	392	1616

Southbound Vehicles			Westbound Vehicles			Northbound Vehicles			Eastbound Vehicles			Southbound HV %			Westbound HV %			Northbound HV %			Eastbound HV%		
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	SB LT	SB TH	SB RT	WB LT	WB TH	WB RT	NB LT	NB TH	NB RT	EB LT	EB TH	EB RT
130	537	0	48	0	31	0	648	187	0	0	0	0.8	0.4	#DIV/0!	0.0	#DIV/0!	3.2	#DIV/0!	2.0	1.6	#DIV/0!	#DIV/0!	#DIV/0!

File Name: C:\Users\Clay\Documents\Work Documents\Clients\2015\ODOT\Jim Bryant\The Dalles\Regular TMC\Weber & 10th.ppd
Start Date: 6/4/2015
Start Time: 2:00:00 PM
Site Code:
Comment 1:
Comment 2:
Comment 3:
Comment 4:

	10TH ST				WEBER ST				10TH ST				WEBER ST					
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	total	hourly total
14:00	10	50	0	0	10	0	20	0	0	55	7	1	0	0	0	0	152	
14:15	14	47	0	0	3	0	26	0	0	54	12	0	0	0	0	0	156	
14:30	9	60	0	0	8	0	20	0	0	52	7	0	0	0	0	0	156	
14:45	14	43	0	0	7	0	27	0	0	52	6	0	0	0	0	0	149	613
15:00	12	48	0	0	15	0	17	0	0	50	9	1	0	0	0	0	151	612
15:15	13	49	0	0	12	0	17	0	0	53	15	0	0	0	0	0	159	615
15:30	21	61	0	0	12	0	21	0	0	47	8	0	0	0	0	0	170	629
15:45	20	54	0	0	11	0	15	0	0	55	7	0	0	0	0	0	162	642
16:00	19	52	0	0	13	0	20	1	0	61	13	0	0	0	0	0	178	669
16:15	5	47	0	0	13	0	14	0	0	58	8	0	0	0	0	0	145	655
16:30	19	57	0	0	13	0	21	1	0	69	8	1	0	0	0	0	187	672
16:45	17	61	0	0	7	0	21	0	0	75	7	0	0	0	0	0	188	698
17:00	15	48	0	0	14	0	32	0	0	82	10	0	0	0	0	0	201	721
17:15	16	57	0	0	20	0	26	0	0	49	11	0	0	0	0	0	179	755
17:30	21	48	0	0	9	0	22	0	0	51	9	0	0	0	0	0	160	728
17:45	16	59	0	0	10	0	17	0	0	61	7	0	0	0	0	0	170	710

Southbound Vehicles			Westbound Vehicles			Northbound Vehicles			Eastbound Vehicles			Southbound HV %			Westbound HV %			Northbound HV %			Eastbound HV%		
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	SB LT	SB TH	SB RT	WB LT	WB TH	WB RT	NB LT	NB TH	NB RT	EB LT	EB TH	EB RT
67	223	0	54	0	100	0	275	36	0	0	0	0.0	1.8	#DIV/0!	1.9	#DIV/0!	1.0	#DIV/0!	1.8	2.8	#DIV/0!	#DIV/0!	#DIV/0!

File Name: Z:\NATHAN TMCS\2015\OR\FORMATTED\9398_-_Weber_&_6th_240738_06-09-2015.ppd
Start Date: 6/9/2015
Start Time: 2:00:00 PM
Site Code: 46021
Comment 1:
Comment 2:
Comment 3:
Comment 4:

	WEBBER ST				6TH ST				WEBBER ST				6TH ST					
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	total	hourly total
02:00 PM	57	23	32	0	39	109	9	0	11	18	14	0	13	95	10	0	430	
02:15 PM	48	18	36	0	51	96	8	0	8	20	18	0	6	117	11	0	437	
02:30 PM	49	26	44	0	34	112	6	0	6	13	17	0	10	116	14	0	447	
02:45 PM	52	15	32	0	28	107	9	0	9	20	13	0	4	125	11	0	425	1739
03:00 PM	41	21	29	0	40	113	6	0	7	7	12	0	14	123	11	0	424	1733
03:15 PM	71	14	38	0	37	99	7	0	12	23	13	0	13	123	21	0	471	1767
03:30 PM	71	22	43	0	31	122	10	0	11	19	18	0	14	118	12	0	491	1811
03:45 PM	57	18	36	0	36	111	7	0	15	21	13	0	12	106	9	0	441	1827
04:00 PM	75	18	37	0	39	130	11	0	5	19	17	0	14	111	18	0	494	1897
04:15 PM	65	14	27	0	38	122	10	0	8	7	11	0	10	108	11	0	431	1857
04:30 PM	73	31	39	0	39	123	4	0	10	17	19	0	12	122	9	0	498	1864
04:45 PM	67	24	32	0	44	105	6	0	11	10	22	0	17	127	8	0	473	1896
05:00 PM	56	28	35	0	35	155	8	0	11	13	15	0	8	127	5	0	496	1898
05:15 PM	83	32	29	0	31	108	8	0	5	10	15	0	14	125	9	0	469	1936
05:30 PM	56	11	22	0	34	143	9	0	17	15	8	0	19	129	17	0	480	1918
05:45 PM	51	15	32	0	19	131	10	0	9	13	9	0	12	125	14	0	440	1885

Southbound Vehicles			Westbound Vehicles			Northbound Vehicles			Eastbound Vehicles			Southbound HV %			Westbound HV %			Northbound HV %			Eastbound HV%		
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	SB LT	SB TH	SB RT	WB LT	WB TH	WB RT	NB LT	NB TH	NB RT	EB LT	EB TH	EB RT
135	115	279	26	491	149	71	50	37	31	501	51	0.7	0.9	5.7	0.0	0.6	2.0	2.8	4.0	0.0	0.0	1.0	0.0

File Name: C:\Users\Clay\Documents\Work Documents\Clients\2015\ODOT\Jim Bryant\The Dalles\Regular TMC\Weber & 2nd.ppd
Start Date: 6/4/2015
Start Time: 2:00:00 PM
Site Code:
Comment 1:
Comment 2:
Comment 3:
Comment 4:

	WEBER ST				2ND ST				WEBER ST				2ND ST					
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	total	hourly total
14:00	10	26	8	0	72	44	10	3	36	17	14	0	1	20	15	0	273	
14:15	7	19	5	0	73	44	16	0	49	18	13	0	5	14	7	0	270	
14:30	5	24	8	0	82	49	20	0	33	16	15	0	4	16	10	0	282	
14:45	7	13	4	0	67	53	10	1	33	12	16	0	6	11	13	0	245	1070
15:00	13	23	5	0	59	25	9	8	31	10	16	0	1	10	16	0	218	1015
15:15	5	21	5	0	97	48	21	0	38	27	16	0	6	23	7	0	314	1059
15:30	6	33	11	0	79	51	18	0	37	8	15	1	2	17	20	0	297	1074
15:45	12	23	9	1	84	52	20	1	37	15	12	0	3	19	10	1	296	1125
16:00	11	28	13	0	78	59	14	1	38	20	22	0	3	17	13	0	316	1223
16:15	9	18	5	0	69	42	22	1	31	10	12	0	4	17	19	1	258	1167
16:30	9	53	9	0	76	45	10	0	32	14	21	0	4	10	11	1	294	1164
16:45	15	32	6	0	80	47	13	0	33	12	14	0	2	14	14	0	282	1150
17:00	23	48	4	0	74	63	9	0	29	7	15	0	3	21	13	0	309	1143
17:15	11	23	2	0	92	62	5	0	37	3	14	0	1	14	11	0	275	1160
17:30	6	10	2	0	61	44	9	0	28	12	22	0	5	5	15	0	219	1085
17:45	3	9	2	0	90	43	15	0	24	7	16	0	2	13	12	0	236	1039

Southbound Vehicles			Westbound Vehicles			Northbound Vehicles			Eastbound Vehicles			Southbound HV %			Westbound HV %			Northbound HV %			Eastbound HV%		
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	SB LT	SB TH	SB RT	WB LT	WB TH	WB RT	NB LT	NB TH	NB RT	EB LT	EB TH	EB RT
34	105	38	338	210	73	150	70	65	14	76	50	0.0	2.9	5.3	4.4	4.3	11.0	2.0	4.3	1.5	7.1	1.3	0.0

File Name: Z:\NATHAN TMCS\2015\OR\FORMATTED\9398_-_Weber_&_1st_240735_06-09-2015.ppd
Start Date: 6/9/2015
Start Time: 2:00:00 PM
Site Code: 46022
Comment 1:
Comment 2:
Comment 3:
Comment 4:

	WEBBER ST				1ST ST				WEBBER ST				1ST ST					
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	total	hourly total
02:00 PM	0	17	4	0	3	0	12	0	8	19	0	0	0	0	0	0	63	63
02:15 PM	0	19	5	0	5	0	10	0	9	26	0	0	0	0	0	0	74	137
02:30 PM	0	20	6	0	1	0	13	0	13	23	0	0	0	0	0	0	76	213
02:45 PM	0	13	2	0	4	0	11	0	11	8	0	0	0	0	0	0	49	262
03:00 PM	0	23	8	0	6	0	9	0	8	21	0	0	0	0	0	0	75	274
03:15 PM	0	30	13	0	6	0	17	0	21	24	0	0	0	0	0	0	111	311
03:30 PM	0	25	12	0	7	0	13	0	11	16	0	0	0	0	0	0	84	319
03:45 PM	0	28	6	0	9	0	15	0	12	24	0	0	0	0	0	0	94	364
04:00 PM	0	26	5	0	3	0	11	0	14	24	0	0	0	0	0	0	83	372
04:15 PM	0	21	7	0	4	0	10	0	12	22	0	0	0	0	0	0	76	337
04:30 PM	0	33	6	0	9	0	12	0	19	19	0	0	0	0	0	0	98	351
04:45 PM	0	38	10	0	4	0	11	0	7	18	0	0	0	0	0	0	88	345
05:00 PM	0	47	15	0	2	0	9	0	3	9	0	0	0	0	0	0	85	347
05:15 PM	0	18	6	0	2	0	7	0	4	12	0	0	0	0	0	0	49	320
05:30 PM	0	8	7	0	7	0	5	0	5	17	0	0	0	0	0	0	49	271
05:45 PM	0	11	8	0	5	0	3	0	1	14	0	0	0	0	0	0	42	225

Southbound Vehicles			Westbound Vehicles			Northbound Vehicles			Eastbound Vehicles			Southbound HV %			Westbound HV %			Northbound HV %			Eastbound HV%		
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	SB LT	SB TH	SB RT	WB LT	WB TH	WB RT	NB LT	NB TH	NB RT	EB LT	EB TH	EB RT
24	109	0	56	0	25	0	88	58	0	0	0	8.3	0.9	#DIV/0!	5.4	#DIV/0!	16.0	#DIV/0!	3.4	10.3	#DIV/0!	#DIV/0!	#DIV/0!

File Name: Z:\NATHAN TMCS\2015\OR\FORMATTED\9398_-_Cherry_Heights_&_10th_225596_04-21-2015.ppd
Start Date: 4/21/2015
Start Time: 6:00:00 AM
Site Code: 46018
Comment 1:
Comment 2:
Comment 3:
Comment 4:

	CHERRY HEIGHTS RD				10TH ST				CHERRY HEIGHTS RD				10TH ST					
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	total	hourly total
02:00 PM	13	13	26	0	18	41	4	0	9	18	0	0	7	32	15	0	196	
02:15 PM	7	13	18	0	20	53	8	0	4	4	2	0	10	52	20	0	211	
02:30 PM	10	19	26	0	14	55	14	0	7	8	3	0	7	50	14	0	227	
02:45 PM	16	18	25	0	29	49	11	0	18	23	4	0	7	46	20	0	266	900
03:00 PM	19	20	23	0	30	55	8	0	3	8	4	0	3	37	23	0	233	937
03:15 PM	9	14	17	0	24	86	12	0	5	10	2	0	5	53	14	0	251	977
03:30 PM	15	9	25	0	26	75	10	0	2	7	3	0	9	63	22	0	266	1016
03:45 PM	13	15	17	0	27	65	8	0	2	13	1	0	7	46	12	0	226	976
04:00 PM	14	16	18	0	25	57	6	0	4	10	5	0	5	39	21	0	220	963
04:15 PM	17	22	14	0	17	60	10	0	3	8	4	0	6	38	23	0	222	934
04:30 PM	15	14	21	0	25	47	7	0	5	10	1	0	4	42	6	0	197	865
04:45 PM	11	17	21	0	30	60	11	0	4	7	3	0	5	47	19	0	235	874
05:00 PM	21	18	19	0	27	77	6	0	3	10	3	0	6	61	11	0	262	916
05:15 PM	23	15	28	0	29	83	3	0	2	11	13	0	4	52	17	0	280	974
05:30 PM	12	23	26	0	30	61	8	0	4	13	5	0	9	46	21	0	258	1035
05:45 PM	13	18	25	0	26	49	3	0	5	12	4	0	7	49	10	0	221	1021

Southbound Vehicles			Westbound Vehicles			Northbound Vehicles			Eastbound Vehicles			Southbound HV %			Westbound HV %			Northbound HV %			Eastbound HV%		
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	SB LT	SB TH	SB RT	WB LT	WB TH	WB RT	NB LT	NB TH	NB RT	EB LT	EB TH	EB RT
70	54	51	36	283	102	11	40	13	69	201	26	2.9	1.9	0.0	8.3	2.1	1.0	9.1	2.5	15.4	1.4	4.0	0.0

File Name: Z:\NATHAN TMCS\2015\OR\FORMATTED\9398_-_Cherry_Heights_&_6th_225600_04-21-2015.ppd
Start Date: 4/21/2015
Start Time: 6:00:00 AM
Site Code: 46019
Comment 1:
Comment 2:
Comment 3:
Comment 4:

	CHERRY HEIGHTS RD				6TH ST				CHERRY HEIGHTS RD				6TH ST					
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	total	hourly total
02:00 PM	62	25	4	0	10	62	7	0	8	11	28	0	31	84	17	0	349	
02:15 PM	57	23	1	0	1	50	6	0	6	12	26	0	23	77	25	0	307	
02:30 PM	48	25	6	0	0	60	5	0	5	14	25	0	35	80	20	0	323	
02:45 PM	46	14	4	0	0	54	5	0	5	24	38	0	39	86	22	0	337	1316
03:00 PM	41	33	6	0	0	55	12	0	3	7	39	0	32	85	20	0	333	1300
03:15 PM	50	22	5	0	1	53	7	0	7	15	41	0	24	81	25	0	331	1324
03:30 PM	50	22	6	0	0	58	13	0	9	17	38	0	35	78	17	0	343	1344
03:45 PM	62	33	7	0	0	58	16	0	8	12	43	0	31	73	28	0	371	1378
04:00 PM	49	25	9	0	1	58	8	0	13	13	40	0	33	95	19	0	363	1408
04:15 PM	46	34	4	0	3	48	9	0	8	13	24	0	21	86	16	0	312	1389
04:30 PM	43	34	2	0	2	55	5	0	7	13	31	0	36	93	12	0	333	1379
04:45 PM	38	23	7	0	2	50	11	0	5	12	26	0	29	68	19	0	290	1298
05:00 PM	51	25	2	0	0	73	9	0	5	8	41	0	34	72	14	0	334	1269
05:15 PM	63	32	2	0	0	62	8	0	9	10	32	0	35	64	12	0	329	1286
05:30 PM	40	28	5	0	0	71	5	0	7	9	44	0	38	73	19	0	339	1292
05:45 PM	41	20	4	0	1	56	7	0	6	4	40	0	43	85	12	0	319	1321

Southbound Vehicles			Westbound Vehicles			Northbound Vehicles			Eastbound Vehicles			Southbound HV %			Westbound HV %			Northbound HV %			Eastbound HV%		
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	SB LT	SB TH	SB RT	WB LT	WB TH	WB RT	NB LT	NB TH	NB RT	EB LT	EB TH	EB RT
22	102	211	44	227	2	162	57	37	89	327	123	0.0	4.9	0.0	0.0	0.4	0.0	1.9	1.8	0.0	3.4	1.8	0.8

File Name: Z:\NATHAN TMCS\2015\OR\FORMATTED\9398_-_Hood_&_Skyline_240724_06-09-2015.ppd
Start Date: 6/9/2015
Start Time: 2:00:00 PM
Site Code: 46030
Comment 1:
Comment 2:
Comment 3:
Comment 4:

	MT HOOD ST				SKYLINE RD				MT HOOD ST									
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	total	hourly total
02:00 PM	0	17	6	0	17	0	4	0	4	20	0	0	0	0	0	0	68	
02:15 PM	0	14	11	0	16	0	4	0	2	19	0	0	0	0	0	0	66	
02:30 PM	0	24	10	0	24	0	9	0	8	22	0	0	0	0	0	0	97	
02:45 PM	0	22	14	0	18	0	12	0	6	16	0	0	0	0	0	0	88	319
03:00 PM	0	21	11	0	17	0	3	0	6	15	0	0	0	0	0	0	73	324
03:15 PM	0	20	16	0	16	0	0	0	7	15	0	0	0	0	0	0	74	332
03:30 PM	0	32	20	0	12	0	5	0	6	28	0	0	0	0	0	0	103	338
03:45 PM	0	25	11	0	14	0	5	0	4	10	0	0	0	0	0	0	69	319
04:00 PM	0	25	13	0	9	0	5	0	1	20	0	0	0	0	0	0	73	319
04:15 PM	0	20	15	0	8	0	2	0	4	22	0	0	0	0	0	0	71	316
04:30 PM	0	18	7	0	20	0	1	0	2	16	0	0	0	0	0	0	64	277
04:45 PM	0	20	12	0	18	0	4	0	2	24	0	0	0	0	0	0	80	288
05:00 PM	0	34	10	0	12	0	7	0	2	24	0	0	0	0	0	0	89	304
05:15 PM	0	29	9	0	13	0	1	0	2	10	0	0	0	0	0	0	64	297
05:30 PM	0	25	19	0	13	0	2	0	2	18	0	0	0	0	0	0	79	312
05:45 PM	0	22	7	0	10	0	3	0	1	17	0	0	0	0	0	0	60	292

Southbound Vehicles			Westbound Vehicles			Northbound Vehicles			Eastbound Vehicles			Southbound HV %			Westbound HV %			Northbound HV %			Eastbound HV%		
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	SB LT	SB TH	SB RT	WB LT	WB TH	WB RT	NB LT	NB TH	NB RT	EB LT	EB TH	EB RT
46	102	0	15	0	51	0	73	18	0	0	0	2.2	3.9	#DIV/0!	6.7	#DIV/0!	11.8	#DIV/0!	4.1	11.1	#DIV/0!	#DIV/0!	#DIV/0!

File Name: C:\Users\Clay\Documents\Work Documents\Clients\2015\ODOT\Jim Bryant\The Dalles\Regular TMC\Hood & 10th.ppd
Start Date: 6/4/2015
Start Time: 2:00:00 PM
Site Code:
Comment 1:
Comment 2:
Comment 3:
Comment 4:

	MT HOOD ST				10TH ST				MT HOOD ST				10TH ST					
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	total	hourly total
02:00 PM	0	8	0	0	10	58	1	0	24	8	15	3	0	47	19	0	190	
02:15 PM	2	14	1	0	7	59	1	0	26	8	5	0	2	48	13	0	186	
02:30 PM	0	14	2	0	8	40	0	0	39	9	11	1	0	53	27	0	203	
02:45 PM	0	7	0	0	5	50	1	0	24	13	14	0	1	44	30	0	189	768
03:00 PM	0	10	1	0	5	50	0	0	27	6	12	1	0	66	23	0	200	778
03:15 PM	3	11	0	0	8	59	0	0	31	4	14	0	1	50	23	0	204	796
03:30 PM	0	10	0	0	7	47	0	0	30	9	13	0	4	67	38	0	225	818
03:45 PM	0	16	1	1	13	63	1	0	24	5	12	1	0	59	23	0	217	846
04:00 PM	0	10	0	0	11	59	1	0	31	7	8	0	0	51	27	0	205	851
04:15 PM	0	12	0	0	12	66	1	0	27	10	5	0	1	48	28	0	210	857
04:30 PM	1	8	0	1	7	66	1	0	25	5	10	0	1	51	22	1	197	829
04:45 PM	1	15	2	0	11	51	0	0	46	8	10	0	0	56	21	0	221	833
05:00 PM	0	22	1	0	16	72	1	0	17	7	8	1	0	60	27	0	231	859
05:15 PM	0	23	0	0	6	49	0	1	27	5	7	0	0	53	24	0	194	843
05:30 PM	1	21	1	0	9	47	1	0	35	8	8	0	0	59	27	3	217	863
05:45 PM	0	11	0	0	6	64	1	0	25	7	3	0	1	62	22	0	202	844

Southbound Vehicles			Westbound Vehicles			Northbound Vehicles			Eastbound Vehicles			Southbound HV %			Westbound HV %			Northbound HV %			Eastbound HV%		
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	SB LT	SB TH	SB RT	WB LT	WB TH	WB RT	NB LT	NB TH	NB RT	EB LT	EB TH	EB RT
3	47	1	39	228	2	116	25	47	5	227	111	0.0	8.5	0.0	2.6	2.2	50.0	5.2	4.0	2.1	0.0	2.2	0.0

File Name: Z:\NATHAN TMCS\2015\OR\FORMATTED\9398_-_Union_&_10th_225593_04-21-2015.ppd
Start Date: Apr-15
Start Time: 6:00:00 AM
Site Code: 46017
Comment 1:
Comment 2:
Comment 3:
Comment 4:

	UNION ST				10TH ST				UNION ST				10TH ST					
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	total	hourly total
02:00 PM	6	14	10	0	5	37	2	0	1	11	2	0	4	45	9	0	146	
02:15 PM	12	9	8	0	5	49	2	0	2	9	7	0	3	37	4	0	147	
02:30 PM	6	16	7	0	10	40	4	0	3	14	5	0	4	43	4	0	156	
02:45 PM	1	15	19	0	16	43	3	0	5	11	3	0	4	68	9	0	197	646
03:00 PM	5	13	16	0	12	49	2	0	4	11	10	0	6	49	2	0	179	679
03:15 PM	6	11	11	0	17	70	6	0	0	15	12	0	3	51	8	0	210	742
03:30 PM	8	14	11	0	10	66	3	0	1	13	3	0	5	45	7	0	186	772
03:45 PM	7	20	9	0	12	65	2	0	2	14	5	0	2	46	4	0	188	763
04:00 PM	3	14	15	0	13	52	1	0	1	9	3	0	3	35	9	0	158	742
04:15 PM	4	13	18	0	11	50	3	0	1	11	5	0	0	37	4	0	157	689
04:30 PM	2	6	20	0	7	44	1	0	2	10	5	0	3	35	1	0	136	639
04:45 PM	9	16	16	0	8	57	2	0	1	13	3	0	3	35	6	0	169	620
05:00 PM	15	19	20	0	9	55	4	0	1	13	7	0	7	44	4	0	198	660
05:15 PM	3	14	9	0	5	58	2	0	2	10	9	0	6	39	8	0	165	668
05:30 PM	6	12	14	0	12	47	1	0	4	13	5	0	6	52	2	0	174	706
05:45 PM	4	19	12	0	7	35	3	0	0	9	5	0	3	42	2	0	141	678

Southbound Vehicles			Westbound Vehicles			Northbound Vehicles			Eastbound Vehicles			Southbound HV %			Westbound HV %			Northbound HV %			Eastbound HV%		
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	SB LT	SB TH	SB RT	WB LT	WB TH	WB RT	NB LT	NB TH	NB RT	EB LT	EB TH	EB RT
62	59	24	12	253	52	23	51	4	28	177	13	0.0	1.7	0.0	0.0	2.8	0.0	4.3	3.9	0.0	0.0	5.1	0.0

File Name: Z:\NATHAN TMCS\2015\OR\FORMATTED\9398_-_Union_&_3rd_225591_04-21-2015.ppd
Start Date: 4/21/2015
Start Time: 6:00:00 AM
Site Code: 46016
Comment 1:
Comment 2:
Comment 3:
Comment 4:

	UNION ST				3RD ST				UNION ST				3RD ST					
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	total	hourly total
02:00 PM	0	19	8	0	0	0	0	0	13	11	0	0	15	139	18	0	223	
02:15 PM	0	14	7	0	0	0	0	0	10	13	0	0	15	159	14	0	232	
02:30 PM	0	15	8	0	0	0	0	0	10	13	0	0	15	153	14	0	228	
02:45 PM	0	15	8	0	0	0	0	0	13	21	0	0	10	150	12	0	229	912
03:00 PM	0	19	11	0	0	0	0	0	10	21	0	0	16	162	14	0	253	942
03:15 PM	0	10	10	0	0	0	0	0	6	14	0	0	10	148	10	0	208	918
03:30 PM	0	25	14	0	0	0	0	0	18	20	0	0	8	139	12	0	236	926
03:45 PM	0	18	8	0	0	0	0	0	4	21	0	0	18	175	11	0	255	952
04:00 PM	0	16	11	0	0	0	0	0	6	20	0	0	15	142	16	0	226	925
04:15 PM	0	14	14	0	0	0	0	0	7	13	0	0	15	156	18	0	237	954
04:30 PM	0	25	9	0	0	0	0	0	6	12	0	0	5	161	19	0	237	955
04:45 PM	0	15	11	0	0	0	0	0	5	22	0	0	10	163	15	0	241	941
05:00 PM	0	25	7	0	0	0	0	0	9	20	0	0	16	148	1	0	226	941
05:15 PM	0	9	8	0	0	0	0	0	10	15	0	0	13	150	3	0	208	912
05:30 PM	0	14	6	0	0	0	0	0	7	17	0	0	10	137	9	0	200	875
05:45 PM	0	9	8	0	0	0	0	0	6	12	0	0	13	135	6	0	189	823

Southbound Vehicles			Westbound Vehicles			Northbound Vehicles			Eastbound Vehicles			Southbound HV %			Westbound HV %			Northbound HV %			Eastbound HV%		
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	SB LT	SB TH	SB RT	WB LT	WB TH	WB RT	NB LT	NB TH	NB RT	EB LT	EB TH	EB RT
42	69	0	0	0	0	0	75	34	49	604	51	2.4	1.4	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	6.7	5.9	2.0	2.5	0.0

File Name: Z:\NATHAN TMCS\2015\OR\FORMATTED\9398_-_Union_&_2nd_225588_04-21-2015.ppd
Start Date: 4/21/2015
Start Time: 6:00:00 AM
Site Code: 46015
Comment 1:
Comment 2:
Comment 3:
Comment 4:

	UNION ST				2ND ST				UNION ST				2ND ST					
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	total	hourly total
02:00 PM	8	16	0	0	19	125	11	0	0	14	18	0	0	0	0	0	211	
02:15 PM	7	7	0	0	10	141	12	0	0	15	13	0	0	0	0	0	205	
02:30 PM	7	8	0	0	11	140	13	0	0	15	19	0	0	0	0	0	213	
02:45 PM	6	10	0	0	15	127	9	0	0	15	14	0	0	0	0	0	196	825
03:00 PM	9	19	0	0	17	145	13	0	0	16	19	0	0	0	0	0	238	852
03:15 PM	12	5	0	0	12	153	14	0	0	13	14	0	0	0	0	0	223	870
03:30 PM	10	22	0	0	19	137	15	0	0	14	19	0	0	0	0	0	236	893
03:45 PM	11	12	0	0	14	153	11	0	0	18	15	0	0	0	0	0	234	931
04:00 PM	11	16	0	0	20	147	11	0	0	12	21	0	0	0	0	0	238	931
04:15 PM	10	12	0	0	21	152	11	0	0	15	16	0	0	0	0	0	237	945
04:30 PM	9	28	0	0	11	137	11	0	0	17	15	0	0	0	0	0	228	937
04:45 PM	7	13	0	0	9	139	9	0	0	18	20	0	0	0	0	0	215	918
05:00 PM	13	17	0	0	8	160	16	0	0	6	17	0	0	0	0	0	237	917
05:15 PM	11	9	0	0	10	147	9	0	0	4	14	0	0	0	0	0	204	884
05:30 PM	5	13	0	0	10	109	7	0	0	7	21	0	0	0	0	0	172	828
05:45 PM	6	5	0	0	3	108	12	0	0	2	19	0	0	0	0	0	155	768

Southbound Vehicles			Westbound Vehicles			Northbound Vehicles			Eastbound Vehicles			Southbound HV %			Westbound HV %			Northbound HV %			Eastbound HV%		
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	SB LT	SB TH	SB RT	WB LT	WB TH	WB RT	NB LT	NB TH	NB RT	EB LT	EB TH	EB RT
0	55	44	51	590	65	69	57	0	0	0	0	#DIV/0!	0.0	2.3	0.0	3.1	13.8	4.3	5.3	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

File Name: Z:\NATHAN TMCS\2015\OR\FORMATTED\9398_-_Kelly_&_10th_240722_06-09-2015.ppd
Start Date: 6/9/2015
Start Time: 2:00:00 PM
Site Code: 46031
Comment 1:
Comment 2:
Comment 3:
Comment 4:

	KELLY AVE				10TH ST				KELLY AVE				10TH ST					
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	total	hourly total
02:00 PM	1	18	2	0	4	18	3	0	4	33	32	0	17	11	4	0	147	
02:15 PM	2	37	6	0	11	22	3	0	2	27	40	0	16	13	5	0	184	
02:30 PM	4	21	6	0	7	17	1	0	4	43	22	0	17	11	2	0	155	
02:45 PM	2	27	4	0	7	17	4	0	2	27	26	0	13	11	3	0	143	629
03:00 PM	1	29	0	0	8	9	4	0	4	27	34	0	12	22	4	0	154	636
03:15 PM	2	39	5	0	4	18	3	0	2	40	23	0	13	19	1	0	169	621
03:30 PM	1	37	2	0	3	16	3	0	2	44	30	0	17	11	4	0	170	636
03:45 PM	1	37	12	0	2	18	1	0	1	42	32	0	21	10	3	0	180	673
04:00 PM	2	43	8	0	7	20	2	0	3	28	34	0	12	14	1	0	174	693
04:15 PM	1	23	9	0	2	12	2	0	0	36	24	0	20	12	4	0	145	669
04:30 PM	4	36	3	0	4	13	5	0	1	30	38	0	15	14	4	0	167	666
04:45 PM	5	46	2	0	6	8	2	0	5	37	25	0	14	12	2	0	164	650
05:00 PM	3	61	12	0	4	20	1	0	3	27	42	0	10	15	3	0	201	677
05:15 PM	0	39	9	0	8	4	3	0	4	23	35	0	29	14	3	0	171	703
05:30 PM	4	34	4	0	5	14	2	0	2	26	28	0	10	6	2	0	137	673
05:45 PM	2	38	4	0	4	19	3	0	1	21	23	0	14	20	2	0	151	660

Southbound Vehicles			Westbound Vehicles			Northbound Vehicles			Eastbound Vehicles			Southbound HV %			Westbound HV %			Northbound HV %			Eastbound HV%		
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	SB LT	SB TH	SB RT	WB LT	WB TH	WB RT	NB LT	NB TH	NB RT	EB LT	EB TH	EB RT
32	156	6	9	72	16	119	154	8	9	54	63	0.0	0.0	16.7	0.0	1.4	0.0	2.5	0.0	12.5	0.0	1.9	3.2

File Name: Z:\NATHAN TMCS\2015\OR\FORMATTED\9398_-_Dry_Hollow_&_3_Mile_240725_06-09-2015.ppd
Start Date: 6/9/2015
Start Time: 2:00:00 PM
Site Code: 46029
Comment 1:
Comment 2:
Comment 3:
Comment 4:

	DRY HOLLOW RD				3 MILE RD				DRY HOLLOW RD									
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	total	hourly total
02:00 PM	0	6	24	0	15	0	2	0	1	11	0	0	0	0	0	0	59	
02:15 PM	0	7	17	0	21	0	2	0	1	10	0	0	0	0	0	0	58	
02:30 PM	0	12	20	0	15	0	2	0	4	14	0	0	0	0	0	0	67	
02:45 PM	0	6	12	0	13	0	0	0	1	14	0	0	0	0	0	0	46	230
03:00 PM	0	7	24	0	19	0	3	0	2	10	0	0	0	0	0	0	65	236
03:15 PM	0	7	16	0	16	0	3	0	1	12	0	0	0	0	0	0	55	233
03:30 PM	0	13	16	0	16	0	4	0	2	22	0	0	0	0	0	0	73	239
03:45 PM	0	11	17	0	12	0	0	0	0	8	0	0	0	0	0	0	48	241
04:00 PM	0	7	17	0	18	0	1	0	2	16	0	0	0	0	0	0	61	237
04:15 PM	0	7	12	0	17	0	0	0	1	9	0	0	0	0	0	0	46	228
04:30 PM	0	8	14	0	14	0	1	0	1	13	0	0	0	0	0	0	51	206
04:45 PM	0	14	17	0	13	0	0	0	2	7	0	0	0	0	0	0	53	211
05:00 PM	0	13	18	0	12	0	4	0	0	8	0	0	0	0	0	0	55	205
05:15 PM	0	13	20	0	14	0	0	0	1	10	0	0	0	0	0	0	58	217
05:30 PM	0	9	13	0	14	0	1	0	0	1	0	0	0	0	0	0	38	204
05:45 PM	0	2	25	0	16	0	1	0	1	9	0	0	0	0	0	0	54	205

Southbound Vehicles			Westbound Vehicles			Northbound Vehicles			Eastbound Vehicles			Southbound HV %			Westbound HV %			Northbound HV %			Eastbound HV%		
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	SB LT	SB TH	SB RT	WB LT	WB TH	WB RT	NB LT	NB TH	NB RT	EB LT	EB TH	EB RT
60	38	0	8	0	62	0	58	5	0	0	0	5.0	10.5	#DIV/0!	12.5	#DIV/0!	4.8	#DIV/0!	5.2	0.0	#DIV/0!	#DIV/0!	#DIV/0!

File Name: Z:\NATHAN TMCS\2015\OR\FORMATTED\9398_-_Dry_Hollow_&_16th_240727_06-09-2015.ppd
Start Date: 6/9/2015
Start Time: 2:00:00 PM
Site Code: 46028
Comment 1:
Comment 2:
Comment 3:
Comment 4:

	16TH PL				DRY HOLLOW RD				19TH ST				DRY HOLLOW RD					
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	total	hourly total
02:00 PM	24	13	4	0	0	16	6	0	10	12	3	0	2	13	23	0	126	
02:15 PM	19	21	2	0	2	11	3	0	6	18	1	0	3	8	22	0	116	
02:30 PM	21	15	2	0	3	18	9	0	5	19	2	0	0	18	23	0	135	
02:45 PM	16	8	3	0	2	11	3	0	5	9	1	0	4	15	9	0	86	463
03:00 PM	25	8	1	0	0	21	7	0	7	20	2	0	3	14	21	0	129	466
03:15 PM	17	15	3	0	3	25	6	0	7	16	0	0	3	23	14	0	132	482
03:30 PM	18	13	5	0	3	15	2	0	6	25	8	0	2	15	23	0	135	482
03:45 PM	17	17	3	0	2	20	4	0	5	26	3	0	1	11	19	0	128	524
04:00 PM	20	12	1	0	4	19	3	0	5	16	3	0	4	17	22	0	126	521
04:15 PM	15	11	1	0	1	19	4	0	1	11	4	0	1	7	19	0	94	483
04:30 PM	18	13	3	0	1	32	2	0	7	23	3	0	3	16	18	0	139	487
04:45 PM	22	9	5	0	3	21	4	0	2	17	9	0	4	15	15	0	126	485
05:00 PM	24	13	4	0	6	18	3	0	2	16	5	0	3	19	17	0	130	489
05:15 PM	27	9	4	0	3	22	3	0	1	14	4	0	2	14	17	0	120	515
05:30 PM	21	9	3	0	6	14	1	0	3	15	4	0	1	17	17	0	111	487
05:45 PM	18	7	1	0	5	15	3	0	1	11	3	0	0	13	17	0	94	455

Southbound Vehicles			Westbound Vehicles			Northbound Vehicles			Eastbound Vehicles			Southbound HV %			Westbound HV %			Northbound HV %			Eastbound HV%		
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	SB LT	SB TH	SB RT	WB LT	WB TH	WB RT	NB LT	NB TH	NB RT	EB LT	EB TH	EB RT
8	57	72	15	79	12	14	83	23	78	66	10	0.0	3.5	5.6	6.7	1.3	0.0	0.0	1.2	4.3	2.6	12.1	0.0

File Name: Z:\NATHAN TMCS\2015\OR\FORMATTED\9398_-_Dry_Hollow_&_10th_225603_04-21-2015.ppd
Start Date: 4/21/2015
Start Time: 6:00:00 AM
Site Code: 46020
Comment 1:
Comment 2:
Comment 3:
Comment 4:

	DRY HOLLOW RD				10TH ST				DRY HOLLOW RD				10TH ST					
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	total	hourly total
02:00 PM	3	39	6	0	4	5	8	0	5	45	0	0	1	6	2	0	124	
02:15 PM	2	34	4	0	1	8	10	0	4	47	0	0	2	10	1	0	123	
02:30 PM	2	45	5	0	2	11	8	0	4	45	0	0	2	6	3	0	133	
02:45 PM	2	38	9	0	2	7	2	0	9	48	0	0	3	12	0	0	132	512
03:00 PM	2	40	10	0	3	16	10	0	3	45	5	0	4	10	0	0	148	536
03:15 PM	4	41	5	0	1	9	6	0	12	57	9	0	4	10	1	0	159	572
03:30 PM	4	48	10	0	2	12	3	0	8	55	4	0	3	16	4	0	169	608
03:45 PM	2	40	9	0	4	18	6	0	1	28	0	0	7	7	2	0	124	600
04:00 PM	7	46	7	0	2	18	3	0	3	47	3	0	4	12	1	0	153	605
04:15 PM	3	42	9	0	3	17	4	0	4	34	9	0	3	12	3	0	143	589
04:30 PM	0	50	13	0	3	8	0	0	4	51	6	0	4	8	2	0	149	569
04:45 PM	2	66	9	0	2	17	6	0	13	54	3	0	4	10	2	0	188	633
05:00 PM	7	57	5	0	4	16	6	0	4	54	5	0	5	10	3	0	176	656
05:15 PM	4	57	9	0	3	9	3	0	2	42	3	0	2	11	3	0	148	661
05:30 PM	5	50	7	0	4	8	4	0	4	32	4	0	0	8	5	0	131	643
05:45 PM	4	38	4	0	3	16	8	0	3	29	3	0	3	8	5	0	124	579

Southbound Vehicles			Westbound Vehicles			Northbound Vehicles			Eastbound Vehicles			Southbound HV %			Westbound HV %			Northbound HV %			Eastbound HV%		
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	SB LT	SB TH	SB RT	WB LT	WB TH	WB RT	NB LT	NB TH	NB RT	EB LT	EB TH	EB RT
36	230	13	15	50	12	17	201	23	10	39	15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

File Name: Z:\NATHAN TMCS\2015\OR\FORMATTED\9398_-_Brewery_&_Hwy_30_240746_06-09-2015.ppd
Start Date: 6/9/2015
Start Time: 6:00:00 AM
Site Code: 46013
Comment 1:
Comment 2:
Comment 3:
Comment 4:

	BREWERY RD				US 30								US 30					
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	total	hourly total
02:00 PM	44	0	6	0	8	56	0	0	0	0	0	0	0	64	43	0	221	
02:15 PM	55	0	3	0	11	52	0	0	0	0	0	0	0	67	50	0	238	
02:30 PM	70	0	4	0	5	38	0	0	0	0	0	0	0	70	40	0	227	
02:45 PM	60	0	9	0	3	57	0	0	0	0	0	0	0	67	58	0	254	940
03:00 PM	67	0	6	0	11	57	0	0	0	0	0	0	0	82	43	0	266	985
03:15 PM	51	0	5	0	5	54	0	0	0	0	0	0	0	78	54	0	247	994
03:30 PM	66	0	5	0	2	49	0	0	0	0	0	0	0	78	65	0	265	1032
03:45 PM	70	0	6	0	3	65	0	0	0	0	0	0	0	81	54	0	279	1057
04:00 PM	68	0	8	0	3	54	0	0	0	0	0	0	0	76	45	0	254	1045
04:15 PM	45	0	8	0	4	56	0	0	0	0	0	0	0	81	45	0	239	1037
04:30 PM	72	0	8	0	3	47	0	0	0	0	0	0	0	76	62	0	268	1040
04:45 PM	52	0	6	0	0	66	0	0	0	0	0	0	0	67	52	0	243	1004
05:00 PM	80	0	8	0	8	69	0	0	0	0	0	0	0	99	68	0	332	1082
05:15 PM	81	0	9	0	13	48	0	0	0	0	0	0	0	79	57	0	287	1130
05:30 PM	68	0	2	0	5	49	0	0	0	0	0	0	0	72	50	0	246	1108
05:45 PM	64	0	3	0	5	42	0	0	0	0	0	0	0	63	42	0	219	1084

Southbound Vehicles			Westbound Vehicles			Northbound Vehicles			Eastbound Vehicles			Southbound HV %			Westbound HV %			Northbound HV %			Eastbound HV%		
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	SB LT	SB TH	SB RT	WB LT	WB TH	WB RT	NB LT	NB TH	NB RT	EB LT	EB TH	EB RT
31	0	285	0	230	24	0	0	0	239	321	0	6.5	#DIV/0!	3.5	#DIV/0!	1.3	0.0	#DIV/0!	#DIV/0!	#DIV/0!	0.0	0.6	#DIV/0!

File Name: Z:\NATHAN TMCS\2015\OR\FORMATTED\9398_-_Brewery_&_84_EB_240755_06-09-2015.ppd
Start Date: 6/11/2015
Start Time: 6:00:00 AM
Site Code: 46008
Comment 1:
Comment 2:
Comment 3:
Comment 4:

	BREWERY RD				I-84 EB ON / OFF RAMPS				BREWERY RD				I-84 EB ON / OFF RAMPS					
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	total	hourly total
02:00 PM	0	32	1	0	0	0	0	0	17	36	0	0	25	0	4	0	115	
02:15 PM	0	35	1	0	0	0	0	0	31	40	0	0	22	0	1	0	130	
02:30 PM	0	35	1	0	0	0	0	0	17	43	0	0	20	0	2	0	118	
02:45 PM	0	44	1	0	0	0	0	0	21	33	0	0	26	0	3	0	128	491
03:00 PM	0	35	3	0	0	0	0	0	19	40	0	0	36	0	2	0	135	511
03:15 PM	0	39	3	0	1	0	0	0	31	38	0	0	21	0	0	0	133	514
03:30 PM	0	54	0	0	0	0	0	0	33	41	0	0	20	0	4	0	152	548
03:45 PM	0	50	1	0	0	0	0	0	24	38	0	0	26	0	2	0	141	561
04:00 PM	0	51	0	0	0	0	0	0	23	28	0	0	26	0	6	0	134	560
04:15 PM	0	33	2	0	0	0	0	0	26	27	0	0	19	3	2	0	112	539
04:30 PM	0	54	2	0	0	0	0	0	33	34	0	0	26	0	2	0	151	538
04:45 PM	0	34	0	0	0	0	0	0	23	30	0	0	27	0	1	0	115	512
05:00 PM	0	50	2	0	0	0	0	0	29	48	0	0	36	0	1	0	166	544
05:15 PM	0	52	2	0	0	0	0	0	30	43	0	0	42	0	2	0	171	603
05:30 PM	0	45	0	0	0	0	0	0	21	32	0	0	30	1	0	0	129	581
05:45 PM	0	46	2	0	0	0	0	0	18	33	0	0	24	0	3	0	126	592

Southbound Vehicles			Westbound Vehicles			Northbound Vehicles			Eastbound Vehicles			Southbound HV %			Westbound HV %			Northbound HV %			Eastbound HV%		
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	SB LT	SB TH	SB RT	WB LT	WB TH	WB RT	NB LT	NB TH	NB RT	EB LT	EB TH	EB RT
6	190	0	0	0	0	0	155	115	6	0	131	0.0	1.1	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.6	0.9	0.0	#DIV/0!	8.4

File Name: Z:\NATHAN TMCS\2015\OR\FORMATTED\9398_-_Riverfront_PArk_&_84_WB_240741_06-09-2015.ppd
Start Date: 6/9/2015
Start Time: 6:00:00 AM
Site Code: 46011
Comment 1:
Comment 2:
Comment 3:
Comment 4:

	RIVERFRONT PARK RD				I-84 WB ON / OFF RAMPS				RIVERFRONT PARK RD				I-84 WB ON / OFF RAMPS					
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	total	hourly total
02:00 PM	3	8	0	0	1	0	26	0	0	11	27	0	0	0	0	0	76	
02:15 PM	3	8	0	0	3	0	26	0	0	11	31	0	0	0	0	0	82	
02:30 PM	6	7	0	0	1	0	30	0	0	9	34	0	0	0	0	0	87	
02:45 PM	0	8	0	0	0	0	35	0	0	12	23	0	0	0	0	0	78	323
03:00 PM	4	12	0	0	0	0	28	0	0	16	26	0	0	0	0	0	86	333
03:15 PM	2	11	0	0	2	1	28	0	0	7	28	0	0	0	0	0	79	330
03:30 PM	2	9	0	0	3	2	45	0	0	10	34	0	0	0	0	0	105	348
03:45 PM	6	9	0	0	0	0	40	0	0	13	26	0	0	0	0	0	94	364
04:00 PM	1	14	0	0	3	0	37	0	0	12	19	0	0	0	0	0	86	364
04:15 PM	6	8	0	0	2	0	27	0	0	7	21	0	0	0	0	0	71	356
04:30 PM	1	13	0	0	2	0	44	0	0	9	29	0	0	0	0	0	98	349
04:45 PM	3	9	0	0	1	0	25	0	0	7	24	0	0	0	0	0	69	324
05:00 PM	5	7	0	0	1	0	44	0	0	12	36	0	0	0	0	0	105	343
05:15 PM	0	13	0	0	0	0	41	0	0	8	37	0	0	0	0	0	99	371
05:30 PM	3	6	0	0	1	0	39	0	0	10	23	0	0	0	0	0	82	355
05:45 PM	3	9	0	0	2	0	36	0	0	9	27	0	0	0	0	0	86	372

Southbound Vehicles			Westbound Vehicles			Northbound Vehicles			Eastbound Vehicles			Southbound HV %			Westbound HV %			Northbound HV %			Eastbound HV%		
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	SB LT	SB TH	SB RT	WB LT	WB TH	WB RT	NB LT	NB TH	NB RT	EB LT	EB TH	EB RT
0	42	9	154	0	4	126	36	0	0	0	0	#DIV/0!	0.0	0.0	2.6	#DIV/0!	0.0	0.8	0.0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

File Name: Z:\NATHAN TMCS\2015\OR\FORMATTED\9398_-_Thompson_&_10th_240721_06-09-2015.ppd
Start Date: 6/9/2015
Start Time: 2:00:00 PM
Site Code: 46032
Comment 1:
Comment 2:
Comment 3:
Comment 4:

	OLD DUFUR RD				10 ST ST				THOMPSON ST				10 ST ST					
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	total	hourly total
02:00 PM	15	3	1	0	0	2	0	0	0	2	7	0	10	5	17	0	62	
02:15 PM	27	10	1	0	1	3	0	0	0	1	9	0	7	1	19	0	79	
02:30 PM	39	8	0	0	0	1	0	0	0	10	10	0	11	4	17	0	100	
02:45 PM	21	5	0	0	0	2	0	0	0	8	6	0	7	3	10	0	62	303
03:00 PM	28	5	0	0	0	3	0	0	0	6	7	0	11	5	28	0	93	334
03:15 PM	36	8	1	0	1	7	1	0	3	3	7	0	7	2	22	0	98	353
03:30 PM	17	6	0	0	0	4	1	0	0	9	11	0	7	6	19	0	80	333
03:45 PM	24	4	0	0	0	2	0	0	0	6	5	0	8	2	15	0	66	337
04:00 PM	20	9	0	0	0	0	1	0	0	6	5	0	11	5	16	0	73	317
04:15 PM	15	5	0	0	0	2	0	0	1	7	3	0	12	4	19	0	68	287
04:30 PM	18	6	0	0	0	5	0	0	0	8	5	0	8	5	16	0	71	278
04:45 PM	13	9	0	0	0	4	1	0	0	9	3	0	19	7	17	0	82	294
05:00 PM	13	8	0	0	0	4	0	0	0	6	9	0	14	4	24	0	82	303
05:15 PM	17	6	1	0	0	1	0	0	1	6	12	0	21	5	21	0	91	326
05:30 PM	10	8	0	0	0	4	1	0	0	7	10	0	20	8	17	0	85	340
05:45 PM	12	6	1	0	0	8	0	0	1	3	12	0	22	3	18	0	86	344

Southbound Vehicles			Westbound Vehicles			Northbound Vehicles			Eastbound Vehicles			Southbound HV %			Westbound HV %			Northbound HV %			Eastbound HV%		
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	SB LT	SB TH	SB RT	WB LT	WB TH	WB RT	NB LT	NB TH	NB RT	EB LT	EB TH	EB RT
1	29	61	1	14	0	29	29	1	78	21	62	0.0	0.0	4.9	0.0	0.0	#DIV/0!	0.0	0.0	0.0	0.0	0.0	0.0

File Name: Z:\NATHAN TMCS\2015\OR\FORMATTED\9398_-_2nd_&_Hwy_30_240719_06-09-2015.ppd
Start Date: 6/9/2015
Start Time: 2:00:00 PM
Site Code: 46033
Comment 1:
Comment 2:
Comment 3:
Comment 4:

	2ND ST				US 30								US 30					
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	total	hourly total
02:00 PM	11	0	12	0	9	37	0	0	0	0	0	0	0	73	17	0	159	
02:15 PM	15	0	8	0	12	46	0	0	0	0	0	0	0	59	9	0	149	
02:30 PM	6	0	5	0	9	35	0	0	0	0	0	0	0	58	13	0	126	
02:45 PM	11	0	12	0	8	53	0	0	0	0	0	0	0	58	16	0	158	592
03:00 PM	9	0	15	0	10	43	0	0	0	0	0	0	0	68	15	0	160	593
03:15 PM	11	0	9	0	10	47	0	0	0	0	0	0	0	78	9	0	164	608
03:30 PM	7	0	6	0	20	42	0	0	0	0	0	0	0	63	14	0	152	634
03:45 PM	11	0	16	0	14	51	0	0	0	0	0	0	0	74	14	0	180	656
04:00 PM	13	0	5	0	12	40	0	0	0	0	0	0	0	67	14	0	151	647
04:15 PM	17	0	13	0	13	44	0	0	0	0	0	0	0	68	16	0	171	654
04:30 PM	11	0	9	0	8	35	0	0	0	0	0	0	0	66	15	0	144	646
04:45 PM	7	0	10	0	10	51	0	0	0	0	0	0	0	55	9	0	142	608
05:00 PM	27	0	19	0	8	36	0	0	0	0	0	0	0	88	10	0	188	645
05:15 PM	20	0	21	0	6	36	0	0	0	0	0	0	0	80	11	0	174	648
05:30 PM	8	0	14	0	3	33	0	0	0	0	0	0	0	59	16	0	133	637
05:45 PM	10	0	6	0	13	29	0	0	0	0	0	0	0	46	21	0	125	620

Southbound Vehicles			Westbound Vehicles			Northbound Vehicles			Eastbound Vehicles			Southbound HV %			Westbound HV %			Northbound HV %			Eastbound HV%		
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	SB LT	SB TH	SB RT	WB LT	WB TH	WB RT	NB LT	NB TH	NB RT	EB LT	EB TH	EB RT
59	0	65	0	158	32	0	0	0	45	289	0	3.4	#DIV/0!	1.5	#DIV/0!	1.3	0.0	#DIV/0!	#DIV/0!	#DIV/0!	0.0	0.7	#DIV/0!

File Name: Z:\NATHAN TMCS\2015\OR\FORMATTED\9398_-_197_&_30_240743_06-09-2015.ppd
Start Date: 6/9/2015
Start Time: 6:00:00 AM
Site Code: 46014
Comment 1:
Comment 2:
Comment 3:
Comment 4:

	US 197				US 30								US 30					
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	total	hourly total
02:00 PM	29	0	27	0	28	16	0	0	0	0	0	0	0	29	59	0	188	
02:15 PM	31	0	36	0	30	30	0	0	0	0	0	0	0	30	40	0	197	
02:30 PM	21	0	25	0	33	24	0	0	0	0	0	0	0	24	42	0	169	
02:45 PM	27	0	31	0	26	30	0	0	0	0	0	0	0	29	39	0	182	736
03:00 PM	27	0	31	0	31	27	0	0	0	0	0	0	0	37	48	0	201	749
03:15 PM	39	0	27	0	34	17	0	0	0	0	0	0	0	29	58	0	204	756
03:30 PM	33	0	33	0	48	31	0	0	0	0	0	0	0	28	41	0	214	801
03:45 PM	35	0	24	0	35	30	0	0	0	0	0	0	0	39	54	0	217	836
04:00 PM	30	0	28	0	31	21	0	0	0	0	0	0	0	36	42	0	188	823
04:15 PM	35	0	29	0	28	22	0	0	0	0	0	0	0	33	54	0	201	820
04:30 PM	18	0	25	0	28	23	0	0	0	0	0	0	0	23	52	0	169	775
04:45 PM	35	0	30	0	27	27	0	0	0	0	0	0	0	29	40	0	188	746
05:00 PM	22	0	41	0	33	16	0	0	0	0	0	0	0	43	62	0	217	775
05:15 PM	20	0	30	0	38	21	0	0	0	0	0	0	0	45	55	0	209	783
05:30 PM	16	0	30	0	32	19	0	0	0	0	0	0	0	25	48	0	170	784
05:45 PM	24	0	33	0	29	15	0	0	0	0	0	0	0	24	30	0	155	751

Southbound Vehicles			Westbound Vehicles			Northbound Vehicles			Eastbound Vehicles			Southbound HV %			Westbound HV %			Northbound HV %			Eastbound HV%		
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	SB LT	SB TH	SB RT	WB LT	WB TH	WB RT	NB LT	NB TH	NB RT	EB LT	EB TH	EB RT
126	0	95	0	87	126	0	0	0	209	140	0	3.2	#DIV/0!	1.1	#DIV/0!	3.4	6.3	#DIV/0!	#DIV/0!	#DIV/0!	1.4	0.7	#DIV/0!

File Name: C:\Users\Clay\Documents\Work Documents\Clients\2015\ODOT\Jim Bryant\The Dalles\Regular TMC\197 & Freemont.ppd
Start Date: 6/4/2015
Start Time: 2:00:00 PM
Site Code:
Comment 1:
Comment 2:
Comment 3:
Comment 4:

	HWY 197				FREEMONT ST				HWY 197				FREEMONT ST					
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	total	hourly total
14:00	17	31	5	0	0	9	16	0	3	23	0	0	5	4	2	0	115	
14:15	19	32	18	0	0	15	20	0	1	30	3	0	11	5	2	0	156	
14:30	17	20	11	0	0	9	21	0	6	25	1	0	9	1	7	0	127	
14:45	14	31	15	0	0	5	18	0	4	30	1	0	12	3	1	0	134	532
15:00	15	36	16	0	0	3	16	0	6	28	0	0	12	10	3	0	145	562
15:15	12	28	17	0	1	13	8	0	6	21	3	0	22	5	2	0	138	544
15:30	13	28	19	0	2	7	30	0	4	28	0	0	20	4	3	0	158	575
15:45	17	34	10	0	1	5	20	0	2	32	0	0	14	1	3	0	139	580
16:00	15	32	18	0	3	8	19	0	5	27	0	0	10	5	2	0	144	579
16:15	17	32	13	0	1	0	16	0	2	24	1	0	6	7	2	0	121	562
16:30	17	27	7	0	0	6	12	0	3	27	0	0	14	4	7	0	124	528
16:45	21	27	11	0	1	6	17	0	4	26	0	0	10	3	3	0	129	518
17:00	22	42	15	0	1	8	19	0	5	18	0	0	14	6	3	0	153	527
17:15	14	44	17	0	1	5	19	0	5	28	0	0	16	7	4	0	160	566
17:30	14	31	12	0	0	1	21	0	2	23	2	0	9	4	4	0	123	565
17:45	15	30	12	0	1	0	11	0	2	20	2	0	15	6	2	0	116	552

Southbound Vehicles			Westbound Vehicles			Northbound Vehicles			Eastbound Vehicles			Southbound HV %			Westbound HV %			Northbound HV %			Eastbound HV%		
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	SB LT	SB TH	SB RT	WB LT	WB TH	WB RT	NB LT	NB TH	NB RT	EB LT	EB TH	EB RT
74	140	50	67	25	67	17	99	0	54	20	17	1.4	2.9	0.0	0.0	0.0	1.5	5.9	8.1	#DIV/0!	1.9	5.0	0.0

File Name: Z:\NATHAN TMCS\2015\OR\FORMATTED\9398_-_197_&_84_EB_240745_06-09-2015.ppd
Start Date: 6/10/2015
Start Time: 6:00:00 AM
Site Code: 33022009
Comment 1:
Comment 2:
Comment 3:
Comment 4:

	US 197				I-84 EB ON / OFF RAMPS				US 197				I-84 EB ON / OFF RAMPS					
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	total	hourly total
02:00 PM	0	41	6	0	0	0	0	0	8	78	0	0	16	0	42	0	191	
02:15 PM	0	47	10	0	0	0	0	0	9	63	0	0	24	0	32	0	185	
02:30 PM	0	36	5	0	0	0	0	0	8	66	0	0	8	0	34	0	157	
02:45 PM	0	38	7	0	0	0	0	0	8	61	0	0	16	0	46	0	176	709
03:00 PM	0	49	8	0	0	0	0	0	7	70	0	0	13	2	53	0	202	720
03:15 PM	0	48	6	0	0	0	0	0	7	84	0	0	13	0	49	0	207	742
03:30 PM	0	50	9	0	0	0	0	0	10	76	0	0	18	0	52	0	215	800
03:45 PM	0	46	5	0	0	0	0	0	7	83	0	0	12	0	47	0	200	824
04:00 PM	0	42	6	0	0	0	0	0	4	68	0	0	18	0	32	0	170	792
04:15 PM	0	48	2	0	0	0	0	0	5	78	0	0	12	0	51	0	196	781
04:30 PM	0	27	9	0	0	0	0	0	7	72	0	0	20	0	64	0	199	765
04:45 PM	0	44	8	0	0	0	0	0	7	59	0	0	19	0	53	0	190	755
05:00 PM	0	45	10	0	0	0	0	0	11	87	0	0	16	0	57	0	226	811
05:15 PM	0	35	11	0	0	0	0	0	6	91	0	0	14	0	65	0	222	837
05:30 PM	0	38	7	0	0	0	0	0	8	74	0	0	10	0	45	0	182	820
05:45 PM	0	36	3	0	0	0	0	0	3	58	0	0	22	0	49	0	171	801

Southbound Vehicles			Westbound Vehicles			Northbound Vehicles			Eastbound Vehicles			Southbound HV %			Westbound HV %			Northbound HV %			Eastbound HV%		
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	SB LT	SB TH	SB RT	WB LT	WB TH	WB RT	NB LT	NB TH	NB RT	EB LT	EB TH	EB RT
38	151	0	0	0	0	0	309	31	239	0	69	13.2	2.0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2.3	3.2	5.4	#DIV/0!	1.4

File Name: Z:\NATHAN TMCS\2015\OR\FORMATTED\9398_-_197_&_84_WB_240744_06-09-2015.ppd
Start Date: 6/9/2015
Start Time: 6:00:00 AM
Site Code: 33012009
Comment 1:
Comment 2:
Comment 3:
Comment 4:

	US 197				I-84 WB ON / OFF RAMPS				US 197				I-84 WB ON / OFF RAMPS					
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	total	hourly total
02:00 PM	68	45	0	0	26	0	3	0	0	98	18	0	0	0	0	0	258	
02:15 PM	62	53	0	0	17	0	1	0	0	81	16	0	0	0	0	0	230	
02:30 PM	81	39	0	0	23	0	3	0	1	79	18	0	0	0	0	0	244	
02:45 PM	63	40	0	0	11	0	4	0	0	96	8	0	0	0	0	0	222	954
03:00 PM	74	53	0	0	17	0	7	0	0	107	19	0	0	0	0	0	277	973
03:15 PM	78	53	0	0	17	1	2	0	0	114	18	0	0	0	0	0	283	1026
03:30 PM	71	49	0	0	13	3	9	0	0	107	23	0	0	0	0	0	275	1057
03:45 PM	83	46	0	0	8	0	4	0	0	104	26	0	0	0	0	0	271	1106
04:00 PM	62	40	0	0	22	0	7	0	0	84	19	0	0	0	0	0	234	1063
04:15 PM	53	45	0	0	11	0	6	0	0	109	14	0	0	0	0	0	238	1018
04:30 PM	68	33	0	0	18	0	1	0	0	125	13	0	0	0	0	0	258	1001
04:45 PM	67	52	0	0	17	0	7	0	0	89	17	0	0	0	0	0	249	979
05:00 PM	79	42	0	0	22	1	10	0	0	130	17	0	0	0	0	0	301	1046
05:15 PM	73	39	0	0	15	0	5	0	0	128	24	0	0	0	0	0	284	1092
05:30 PM	67	38	0	0	16	0	6	0	0	100	19	0	0	0	0	0	246	1080
05:45 PM	65	32	0	0	12	0	4	0	0	89	16	0	1	0	0	0	219	1050

Southbound Vehicles			Westbound Vehicles			Northbound Vehicles			Eastbound Vehicles			Southbound HV %			Westbound HV %			Northbound HV %			Eastbound HV%		
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	SB LT	SB TH	SB RT	WB LT	WB TH	WB RT	NB LT	NB TH	NB RT	EB LT	EB TH	EB RT
0	166	287	23	1	72	71	472	0	0	0	0	#DIV/0!	5.4	5.6	0.0	0.0	4.2	7.0	2.8	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

File Name: C:\Users\Clay\Documents\Work Documents\Clients\2015\ODOT\Jim Bryant\The Dalles\Regular TMC\197 & Bret Clodfelter.ppd
Start Date: 6/4/2015
Start Time: 2:00:00 PM
Site Code:
Comment 1:
Comment 2:
Comment 3:
Comment 4:

	HWY 197				BRET CLODFELTER				HWY 197				BRET CLODFELTER					
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	total	hourly total
14:00	4	90	0	0	24	0	7	0	0	98	20	0	0	0	0	0	243	
14:15	5	95	0	0	19	0	8	0	0	79	23	0	0	0	0	0	229	
14:30	3	106	0	0	13	0	8	0	0	76	19	0	0	0	0	0	225	
14:45	4	84	0	0	14	0	5	0	0	85	25	0	0	0	0	0	217	914
15:00	11	101	0	0	31	0	5	0	0	100	27	0	0	0	0	0	275	946
15:15	3	103	0	1	24	0	8	0	0	110	19	0	0	0	0	0	267	984
15:30	5	95	0	0	27	0	7	0	0	96	26	0	0	0	0	0	256	1015
15:45	3	111	0	0	14	0	8	0	0	91	18	0	0	0	0	0	245	1043
16:00	5	83	0	0	17	0	12	0	0	81	24	0	0	0	0	0	222	990
16:15	5	88	0	0	19	0	7	0	0	93	23	0	0	0	0	0	235	958
16:30	1	72	0	1	19	0	5	0	0	125	26	0	0	0	0	0	248	950
16:45	7	104	0	0	26	0	9	0	0	86	19	0	0	0	0	0	251	956
17:00	5	97	0	0	17	0	7	0	0	139	14	0	0	0	0	0	279	1013
17:15	2	82	0	0	29	0	12	0	0	123	15	0	0	0	0	0	263	1041
17:30	4	91	0	0	17	0	7	0	0	94	25	0	0	0	0	0	238	1031
17:45	1	83	0	0	14	0	4	0	0	81	18	0	0	0	0	0	201	981

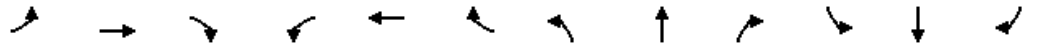
Southbound Vehicles			Westbound Vehicles			Northbound Vehicles			Eastbound Vehicles			Southbound HV %			Westbound HV %			Northbound HV %			Eastbound HV%		
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	SB LT	SB TH	SB RT	WB LT	WB TH	WB RT	NB LT	NB TH	NB RT	EB LT	EB TH	EB RT
15	355	0	33	0	33	0	473	74	0	0	0	0.0	5.4	#DIV/0!	15.2	#DIV/0!	0.0	#DIV/0!	3.2	8.1	#DIV/0!	#DIV/0!	#DIV/0!

File Name: Z:\NATHAN TMCS\2015\OR\FORMATTED\9398_-_197_&_Lone_Pine_240716_06-09-2015.ppd
Start Date: 6/9/2015
Start Time: 2:00:00 PM
Site Code: 46034
Comment 1:
Comment 2:
Comment 3:
Comment 4:

	US 197								US 197				LONE PINE					
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	total	hourly total
02:00 PM	8	50	0	0	0	0	0	0	0	75	40	0	36	0	7	0	216	
02:15 PM	7	69	0	0	0	0	0	0	0	49	34	0	31	0	9	0	199	
02:30 PM	5	76	0	0	0	0	0	0	0	51	36	0	33	0	6	0	207	
02:45 PM	4	67	0	0	0	0	0	0	0	66	21	0	28	0	6	0	192	814
03:00 PM	3	65	0	0	0	0	0	0	0	63	37	0	32	0	4	0	204	802
03:15 PM	9	86	0	0	0	0	0	0	0	83	41	0	28	0	10	0	257	860
03:30 PM	6	68	0	0	0	0	0	0	0	74	29	0	31	0	8	0	216	869
03:45 PM	7	86	0	0	0	0	0	0	0	65	33	0	35	0	7	0	233	910
04:00 PM	9	54	0	0	0	0	0	0	0	65	28	0	36	0	8	0	200	906
04:15 PM	4	56	0	0	0	0	0	0	0	79	23	0	24	0	8	0	194	843
04:30 PM	1	55	0	0	0	0	0	0	0	86	39	0	29	0	9	0	219	846
04:45 PM	3	59	0	0	0	0	0	0	0	77	22	0	39	0	8	0	208	821
05:00 PM	3	64	0	0	0	0	0	0	0	102	34	0	42	0	5	0	250	871
05:15 PM	3	64	0	0	0	0	0	0	0	108	36	0	30	0	11	0	252	929
05:30 PM	4	54	0	0	0	0	0	0	0	79	23	0	26	0	6	0	192	902
05:45 PM	7	69	0	0	0	0	0	0	0	61	26	0	24	0	10	0	197	891

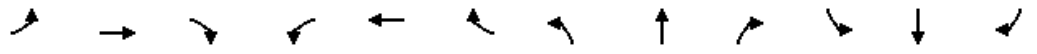
Southbound Vehicles			Westbound Vehicles			Northbound Vehicles			Eastbound Vehicles			Southbound HV %			Westbound HV %			Northbound HV %			Eastbound HV%		
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	SB LT	SB TH	SB RT	WB LT	WB TH	WB RT	NB LT	NB TH	NB RT	EB LT	EB TH	EB RT
0	242	10	0	0	0	131	373	0	33	0	140	#DIV/0!	8.7	0.0	#DIV/0!	#DIV/0!	#DIV/0!	0.8	4.3	#DIV/0!	0.0	#DIV/0!	0.7

Appendix F Existing Traffic Conditions Worksheets



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	501	51	26	496	149	76	50	37	135	115	283
Future Volume (vph)	31	501	51	26	496	149	76	50	37	135	115	283
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0	5.0		4.0	4.0		5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.97	1.00		0.97	1.00
Satd. Flow (prot)	1805	1857		1805	1881	1583		1784	1615		1832	1524
Flt Permitted	0.33	1.00		0.27	1.00	1.00		0.72	1.00		0.76	1.00
Satd. Flow (perm)	627	1857		513	1881	1583		1315	1615		1434	1524
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	32	516	53	27	511	154	78	52	38	139	119	292
RTOR Reduction (vph)	0	4	0	0	0	87	0	0	27	0	0	170
Lane Group Flow (vph)	32	565	0	27	511	67	0	130	11	0	258	122
Heavy Vehicles (%)	0%	1%	0%	0%	1%	2%	3%	4%	0%	1%	1%	6%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6		6	8		8	4		4
Actuated Green, G (s)	25.7	24.0		25.9	24.1	24.1		15.7	15.7		14.7	14.7
Effective Green, g (s)	25.7	24.0		25.9	24.1	24.1		15.7	15.7		14.7	14.7
Actuated g/C Ratio	0.46	0.43		0.47	0.43	0.43		0.28	0.28		0.26	0.26
Clearance Time (s)	5.0	5.0		5.0	5.0	5.0		4.0	4.0		5.0	5.0
Vehicle Extension (s)	2.0	4.5		2.5	4.5	4.5		2.5	2.5		2.0	2.0
Lane Grp Cap (vph)	326	803		281	816	687		371	456		379	403
v/s Ratio Prot	0.00	c0.30		c0.00	0.27							
v/s Ratio Perm	0.04			0.04		0.04		0.10	0.01		c0.18	0.08
v/c Ratio	0.10	0.70		0.10	0.63	0.10		0.35	0.02		0.68	0.30
Uniform Delay, d1	8.6	12.8		8.9	12.2	9.3		15.8	14.4		18.3	16.3
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	0.0	3.2		0.1	1.9	0.1		0.4	0.0		4.0	0.2
Delay (s)	8.7	16.1		9.0	14.1	9.4		16.3	14.4		22.3	16.5
Level of Service	A	B		A	B	A		B	B		C	B
Approach Delay (s)		15.7			12.9			15.8			19.2	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	15.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	55.5	Sum of lost time (s)	15.0
Intersection Capacity Utilization	62.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	76	50	338	210	73	150	70	65	34	105	38
Future Volume (vph)	14	76	50	338	210	73	150	70	65	34	105	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0	5.0		4.0	4.0		5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	
Frt	1.00	0.94		1.00	1.00	0.85		1.00	0.85		0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.97	1.00		0.99	
Satd. Flow (prot)	1805	1728		1626	1827	1553		1790	1583		1775	
Flt Permitted	0.61	1.00		0.51	1.00	1.00		0.67	1.00		0.90	
Satd. Flow (perm)	1159	1728		870	1827	1553		1242	1583		1605	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	16	86	57	384	239	83	170	80	74	39	119	43
RTOR Reduction (vph)	0	29	0	0	0	44	0	0	53	0	10	0
Lane Group Flow (vph)	16	114	0	384	239	39	0	250	21	0	191	0
Heavy Vehicles (%)	0%	1%	7%	11%	4%	4%	2%	4%	2%	6%	3%	0%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6		6	8		8	4		
Actuated Green, G (s)	17.0	16.1		34.3	28.4	28.4		17.5	17.5		16.5	
Effective Green, g (s)	17.0	16.1		34.3	28.4	28.4		17.5	17.5		16.5	
Actuated g/C Ratio	0.28	0.26		0.56	0.47	0.47		0.29	0.29		0.27	
Clearance Time (s)	5.0	5.0		5.0	5.0	5.0		4.0	4.0		5.0	
Vehicle Extension (s)	2.0	4.5		2.5	4.5	4.5		2.5	2.5		2.0	
Lane Grp Cap (vph)	333	457		654	853	725		357	455		435	
v/s Ratio Prot	0.00	0.07		c0.13	0.13							
v/s Ratio Perm	0.01			c0.20		0.02		c0.20	0.01		0.12	
v/c Ratio	0.05	0.25		0.59	0.28	0.05		0.70	0.05		0.44	
Uniform Delay, d1	15.9	17.6		7.9	9.9	8.9		19.3	15.6		18.3	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2	0.0	0.5		1.1	0.3	0.1		5.7	0.0		0.3	
Delay (s)	15.9	18.1		9.0	10.2	8.9		25.0	15.7		18.6	
Level of Service	B	B		A	B	A		C	B		B	
Approach Delay (s)		17.9			9.4			22.8			18.6	
Approach LOS		B			A			C			B	

Intersection Summary			
HCM 2000 Control Delay	14.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	60.8	Sum of lost time (s)	15.0
Intersection Capacity Utilization	64.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	327	123	44	227	2	162	57	37	22	102	211
Future Volume (vph)	89	327	123	44	227	2	162	57	37	22	102	211
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94		1.00	0.90	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	1863	1599	1805	1900	1615	1770	1766		1805	1680	
Flt Permitted	0.45	1.00	1.00	0.42	1.00	1.00	0.26	1.00		0.69	1.00	
Satd. Flow (perm)	822	1863	1599	790	1900	1615	485	1766		1311	1680	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	98	359	135	48	249	2	178	63	41	24	112	232
RTOR Reduction (vph)	0	0	90	0	0	1	0	17	0	0	60	0
Lane Group Flow (vph)	98	359	45	48	249	1	178	87	0	24	284	0
Heavy Vehicles (%)	3%	2%	1%	0%	0%	0%	2%	2%	0%	0%	5%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8			4		
Actuated Green, G (s)	34.2	27.7	27.7	28.4	24.8	24.8	36.9	29.9		24.2	22.2	
Effective Green, g (s)	34.2	27.7	27.7	28.4	24.8	24.8	36.9	29.9		24.2	22.2	
Actuated g/C Ratio	0.41	0.33	0.33	0.34	0.30	0.30	0.44	0.36		0.29	0.27	
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0	3.0	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	410	620	532	313	566	481	364	634		393	448	
v/s Ratio Prot	c0.02	c0.19		0.01	0.13		c0.06	0.05		0.00	c0.17	
v/s Ratio Perm	0.08		0.03	0.05		0.00	0.16			0.02		
v/c Ratio	0.24	0.58	0.08	0.15	0.44	0.00	0.49	0.14		0.06	0.63	
Uniform Delay, d1	15.6	22.9	19.0	18.8	23.6	20.5	15.8	18.0		21.2	26.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	1.3	0.1	0.1	0.5	0.0	0.4	0.0		0.0	2.2	
Delay (s)	15.7	24.2	19.1	18.8	24.1	20.5	16.2	18.0		21.2	29.1	
Level of Service	B	C	B	B	C	C	B	B		C	C	
Approach Delay (s)		21.7			23.3			16.9			28.6	
Approach LOS		C			C			B			C	

Intersection Summary			
HCM 2000 Control Delay	22.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	83.2	Sum of lost time (s)	20.0
Intersection Capacity Utilization	66.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑						↱		↰	↑	
Traffic Volume (vph)	50	604	51	0	0	0	0	76	34	42	69	0
Future Volume (vph)	50	604	51	0	0	0	0	76	34	42	69	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.5						4.5		4.0	4.5	
Lane Util. Factor		0.95						1.00		1.00	1.00	
Frt		0.99						0.96		1.00	1.00	
Flt Protected		1.00						1.00		0.95	1.00	
Satd. Flow (prot)		3218						1571		1630	1733	
Flt Permitted		1.00						1.00		0.95	1.00	
Satd. Flow (perm)		3218						1571		1630	1733	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	57	686	58	0	0	0	0	86	39	48	78	0
RTOR Reduction (vph)	0	7	0	0	0	0	0	19	0	0	0	0
Lane Group Flow (vph)	0	794	0	0	0	0	0	106	0	48	78	0
Heavy Vehicles (%)	2%	2%	0%	0%	0%	0%	0%	7%	6%	2%	1%	0%
Turn Type	Perm	NA						NA		Prot	NA	
Protected Phases		2						8		7	4	
Permitted Phases	2											
Actuated Green, G (s)		30.0						30.0		15.5	49.5	
Effective Green, g (s)		30.0						30.0		15.5	49.5	
Actuated g/C Ratio		0.34						0.34		0.18	0.56	
Clearance Time (s)		4.5						4.5		4.0	4.5	
Lane Grp Cap (vph)		1090						532		285	969	
v/s Ratio Prot								c0.07		c0.03	0.05	
v/s Ratio Perm		0.25										
v/c Ratio		0.73						0.20		0.17	0.08	
Uniform Delay, d1		25.7						20.7		31.0	9.0	
Progression Factor		1.00						1.00		1.00	1.00	
Incremental Delay, d2		4.3						0.8		1.3	0.2	
Delay (s)		30.0						21.6		32.3	9.2	
Level of Service		C						C		C	A	
Approach Delay (s)		30.0			0.0			21.6			18.0	
Approach LOS		C			A			C			B	

Intersection Summary				
HCM 2000 Control Delay	27.5	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.40			
Actuated Cycle Length (s)	88.5	Sum of lost time (s)	13.0	
Intersection Capacity Utilization	38.2%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	53	590	65	69	57	0	0	58	44
Future Volume (vph)	0	0	0	53	590	65	69	57	0	0	58	44
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Width	12	12	12	12	12	12	12	16	12	12	12	12
Total Lost time (s)				4.5	4.5			4.5			4.5	
Lane Util. Factor				1.00	0.95			1.00			1.00	
Frt				1.00	0.99			1.00			0.94	
Flt Protected				0.95	1.00			0.97			1.00	
Satd. Flow (prot)				1662	3147			1848			1635	
Flt Permitted				0.95	1.00			0.81			1.00	
Satd. Flow (perm)				1662	3147			1533			1635	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	0	0	0	58	648	71	76	63	0	0	64	48
RTOR Reduction (vph)	0	0	0	0	12	0	0	0	0	0	30	0
Lane Group Flow (vph)	0	0	0	58	707	0	0	139	0	0	82	0
Heavy Vehicles (%)	0%	0%	0%	0%	3%	14%	4%	5%	0%	0%	0%	2%
Turn Type				Perm	NA		Perm	NA			NA	
Protected Phases					6			8			4	
Permitted Phases				6			8					
Actuated Green, G (s)				33.0	33.0			26.0			26.0	
Effective Green, g (s)				33.0	33.0			26.0			26.0	
Actuated g/C Ratio				0.49	0.49			0.38			0.38	
Clearance Time (s)				4.5	4.5			4.5			4.5	
Lane Grp Cap (vph)				806	1527			586			625	
v/s Ratio Prot					c0.22						0.05	
v/s Ratio Perm				0.03				c0.09				
v/c Ratio				0.07	0.46			0.24			0.13	
Uniform Delay, d1				9.3	11.6			14.3			13.7	
Progression Factor				1.00	1.00			1.00			1.00	
Incremental Delay, d2				0.2	1.0			1.0			0.4	
Delay (s)				9.5	12.6			15.2			14.1	
Level of Service				A	B			B			B	
Approach Delay (s)		0.0			12.4			15.2			14.1	
Approach LOS		A			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	13.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	68.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	41.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	5.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	108	52	29	2	3	77
Future Vol, veh/h	108	52	29	2	3	77
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	1	0	7	50	0	3
Mvmt Flow	129	62	35	2	4	92

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	37	0	-	0	355	36
Stage 1	-	-	-	-	36	-
Stage 2	-	-	-	-	319	-
Critical Hdwy	4.11	-	-	-	6.4	6.23
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.209	-	-	-	3.5	3.327
Pot Cap-1 Maneuver	1580	-	-	-	647	1034
Stage 1	-	-	-	-	992	-
Stage 2	-	-	-	-	741	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1580	-	-	-	592	1034
Mov Cap-2 Maneuver	-	-	-	-	592	-
Stage 1	-	-	-	-	992	-
Stage 2	-	-	-	-	678	-

Approach	EB	WB	SB
HCM Control Delay, s	5	0	9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1580	-	-	-	1006
HCM Lane V/C Ratio	0.081	-	-	-	0.095
HCM Control Delay (s)	7.5	0	-	-	9
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.3	-	-	-	0.3

Intersection	
Int Delay, s/veh	6.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	310	15	50	187	19	44
Future Vol, veh/h	310	15	50	187	19	44
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	Yield	-	None
Storage Length	150	0	-	-	300	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	4	0	2	6	7	0
Mvmt Flow	356	17	57	215	22	51

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	151	57	0	0	57	0
Stage 1	57	-	-	-	-	-
Stage 2	94	-	-	-	-	-
Critical Hdwy	6.44	6.2	-	-	4.17	-
Critical Hdwy Stg 1	5.44	-	-	-	-	-
Critical Hdwy Stg 2	5.44	-	-	-	-	-
Follow-up Hdwy	3.536	3.3	-	-	2.263	-
Pot Cap-1 Maneuver	836	1015	-	-	1516	-
Stage 1	960	-	-	-	-	-
Stage 2	925	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	824	1015	-	-	1516	-
Mov Cap-2 Maneuver	824	-	-	-	-	-
Stage 1	960	-	-	-	-	-
Stage 2	912	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.5	0	2.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	824	1015	1516	-
HCM Lane V/C Ratio	-	-	0.432	0.017	0.014	-
HCM Control Delay (s)	-	-	12.7	8.6	7.4	-
HCM Lane LOS	-	-	B	A	A	-
HCM 95th %tile Q(veh)	-	-	2.2	0.1	0	-

Intersection	
Int Delay, s/veh	4.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	151	55	26	141	0	0	0	0	14	1	184
Future Vol, veh/h	0	151	55	26	141	0	0	0	0	14	1	184
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Free	-	-	None	-	-	None	-	-	Stop
Storage Length	-	-	-	115	-	-	-	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	82	82	82	82	82	82	82	82	82
Heavy Vehicles, %	0	6	6	0	3	0	0	0	0	31	0	6
Mvmt Flow	0	184	67	32	172	0	0	0	0	17	1	224

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	172	0	-	184	0	0	419	419	172
Stage 1	-	-	-	-	-	-	235	235	-
Stage 2	-	-	-	-	-	-	184	184	-
Critical Hdwy	4.1	-	-	4.1	-	-	6.71	6.5	6.26
Critical Hdwy Stg 1	-	-	-	-	-	-	5.71	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.71	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.779	4	3.354
Pot Cap-1 Maneuver	1417	-	0	1403	-	-	539	528	861
Stage 1	-	-	0	-	-	-	740	714	-
Stage 2	-	-	0	-	-	-	782	751	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1417	-	-	1403	-	-	527	0	861
Mov Cap-2 Maneuver	-	-	-	-	-	-	527	0	-
Stage 1	-	-	-	-	-	-	723	0	-
Stage 2	-	-	-	-	-	-	782	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	1.2	10.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1417	-	1403	-	-	527	861
HCM Lane V/C Ratio	-	-	0.023	-	-	0.035	0.261
HCM Control Delay (s)	0	-	7.6	-	-	12.1	10.6
HCM Lane LOS	A	-	A	-	-	B	B
HCM 95th %tile Q(veh)	0	-	0.1	-	-	0.1	1

Intersection	
Int Delay, s/veh	5.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	127	38	0	0	94	43	73	0	3	0	0	0
Future Vol, veh/h	127	38	0	0	94	43	73	0	3	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	160	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	79	79	79	79	79	79	79	79	79	79	79	79
Heavy Vehicles, %	5	18	0	0	0	7	3	0	67	0	0	0
Mvmt Flow	161	48	0	0	119	54	92	0	4	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	173	0	0	48	0	0	516	543	48
Stage 1	-	-	-	-	-	-	370	370	-
Stage 2	-	-	-	-	-	-	146	173	-
Critical Hdwy	4.15	-	-	4.1	-	-	6.43	6.5	6.87
Critical Hdwy Stg 1	-	-	-	-	-	-	5.43	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.43	5.5	-
Follow-up Hdwy	2.245	-	-	2.2	-	-	3.527	4	3.903
Pot Cap-1 Maneuver	1386	-	-	1572	-	-	517	450	864
Stage 1	-	-	-	-	-	-	696	624	-
Stage 2	-	-	-	-	-	-	879	760	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	1386	-	-	1572	-	-	457	0	864
Mov Cap-2 Maneuver	-	-	-	-	-	-	457	0	-
Stage 1	-	-	-	-	-	-	615	0	-
Stage 2	-	-	-	-	-	-	879	0	-

Approach	EB	WB	NB
HCM Control Delay, s	6.1	0	14.7
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR
Capacity (veh/h)	466	1386	-	-	1572	-	-
HCM Lane V/C Ratio	0.206	0.116	-	-	-	-	-
HCM Control Delay (s)	14.7	7.9	-	-	0	-	-
HCM Lane LOS	B	A	-	-	A	-	-
HCM 95th %tile Q(veh)	0.8	0.4	-	-	0	-	-

Intersection	
Int Delay, s/veh	1.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	23	23	135	32	14	124
Future Vol, veh/h	23	23	135	32	14	124
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	0	0	1	0	0	2
Mvmt Flow	28	28	165	39	17	151

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	369	184	0	0	204	0
Stage 1	184	-	-	-	-	-
Stage 2	185	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	635	864	-	-	1380	-
Stage 1	852	-	-	-	-	-
Stage 2	852	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	627	864	-	-	1380	-
Mov Cap-2 Maneuver	627	-	-	-	-	-
Stage 1	852	-	-	-	-	-
Stage 2	841	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.4	0	0.8
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	727	1380	-
HCM Lane V/C Ratio	-	-	0.077	0.012	-
HCM Control Delay (s)	-	-	10.4	7.6	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Intersection	
Int Delay, s/veh	7.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	5	2	47	7	4	0	121	3	2	0	4	5
Future Vol, veh/h	5	2	47	7	4	0	121	3	2	0	4	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	75	-	-	-
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	50	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	6	2	56	8	5	0	144	4	2	0	5	6

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	302	300	8	329	303	4	11	0	0	4	0	0
Stage 1	8	8	-	292	292	-	-	-	-	-	-	-
Stage 2	294	292	-	37	11	-	-	-	-	-	-	-
Critical Hdwy	7.1	7	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	6	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	6	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4.45	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	654	540	1080	628	613	1085	1621	-	-	1631	-	-
Stage 1	1019	802	-	720	675	-	-	-	-	-	-	-
Stage 2	719	592	-	984	890	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	606	492	1080	553	558	1085	1621	-	-	1631	-	-
Mov Cap-2 Maneuver	606	492	-	553	558	-	-	-	-	-	-	-
Stage 1	928	802	-	656	615	-	-	-	-	-	-	-
Stage 2	650	539	-	930	890	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9	11.6	7.1	0
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1621	-	-	967	555	1631	-	-
HCM Lane V/C Ratio	0.089	-	-	0.066	0.024	-	-	-
HCM Control Delay (s)	7.4	0	-	9	11.6	0	-	-
HCM Lane LOS	A	A	-	A	B	A	-	-
HCM 95th %tile Q(veh)	0.3	-	-	0.2	0.1	0	-	-

Intersection	
Int Delay, s/veh	2.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	48	33	665	190	139	535
Future Vol, veh/h	48	33	665	190	139	535
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	-	-	-	125	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	3	2	2	1	0
Mvmt Flow	51	35	700	200	146	563

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1656	800	0	0	900	0
Stage 1	800	-	-	-	-	-
Stage 2	856	-	-	-	-	-
Critical Hdwy	6.4	6.23	-	-	4.11	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.327	-	-	2.209	-
Pot Cap-1 Maneuver	109	383	-	-	759	-
Stage 1	446	-	-	-	-	-
Stage 2	420	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	88	383	-	-	759	-
Mov Cap-2 Maneuver	215	-	-	-	-	-
Stage 1	446	-	-	-	-	-
Stage 2	339	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	25.2	0	2.2
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	262	759	-
HCM Lane V/C Ratio	-	-	0.325	0.193	-
HCM Control Delay (s)	-	-	25.2	10.9	-
HCM Lane LOS	-	-	D	B	-
HCM 95th %tile Q(veh)	-	-	1.4	0.7	-

Intersection	
Int Delay, s/veh	3.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	54	100	275	36	67	223
Future Vol, veh/h	54	100	275	36	67	223
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	175	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	1	2	2	0	0	2
Mvmt Flow	57	106	293	38	71	237

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	692	312	0	0	331	0
Stage 1	312	-	-	-	-	-
Stage 2	380	-	-	-	-	-
Critical Hdwy	6.41	6.22	-	-	4.1	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.318	-	-	2.2	-
Pot Cap-1 Maneuver	411	728	-	-	1240	-
Stage 1	744	-	-	-	-	-
Stage 2	694	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	384	728	-	-	1240	-
Mov Cap-2 Maneuver	384	-	-	-	-	-
Stage 1	744	-	-	-	-	-
Stage 2	648	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.6	0	1.9
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	384	728	1240	-
HCM Lane V/C Ratio	-	-	0.15	0.146	0.057	-
HCM Control Delay (s)	-	-	16	10.8	8.1	0
HCM Lane LOS	-	-	C	B	A	A
HCM 95th %tile Q(veh)	-	-	0.5	0.5	0.2	-

Intersection	
Int Delay, s/veh	2.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	56	25	88	58	24	109
Future Vol, veh/h	56	25	88	58	24	109
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	5	16	3	10	8	1
Mvmt Flow	58	26	91	60	25	112

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	283	121	0	0	151	0
Stage 1	121	-	-	-	-	-
Stage 2	162	-	-	-	-	-
Critical Hdwy	6.45	6.36	-	-	4.18	-
Critical Hdwy Stg 1	5.45	-	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-	-	-
Follow-up Hdwy	3.545	3.444	-	-	2.272	-
Pot Cap-1 Maneuver	701	894	-	-	1394	-
Stage 1	897	-	-	-	-	-
Stage 2	860	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	688	894	-	-	1394	-
Mov Cap-2 Maneuver	688	-	-	-	-	-
Stage 1	897	-	-	-	-	-
Stage 2	844	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.5	0	1.4
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	741	1394	-
HCM Lane V/C Ratio	-	-	0.113	0.018	-
HCM Control Delay (s)	-	-	10.5	7.6	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.4	0.1	-

Intersection	
Intersection Delay, s/veh	16.1
Intersection LOS	C

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	69	215	28	0	36	283	102	0	11	40	13
Future Vol, veh/h	0	69	215	28	0	36	283	102	0	11	40	13
Peak Hour Factor	0.92	0.84	0.84	0.84	0.92	0.84	0.84	0.84	0.92	0.84	0.84	0.84
Heavy Vehicles, %	2	1	4	0	2	8	2	1	2	9	3	15
Mvmt Flow	0	82	256	33	0	43	337	121	0	13	48	15
Number of Lanes	0	0	1	1	0	0	1	1	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	2	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	2
HCM Control Delay	17	17.4	11.1
HCM LOS	C	C	B

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	17%	24%	0%	11%	0%	40%
Vol Thru, %	62%	76%	0%	89%	0%	31%
Vol Right, %	20%	0%	100%	0%	100%	29%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	64	284	28	319	102	175
LT Vol	11	69	0	36	0	70
Through Vol	40	215	0	283	0	54
RT Vol	13	0	28	0	102	51
Lane Flow Rate	76	338	33	380	121	208
Geometry Grp	2	7	7	7	7	2
Degree of Util (X)	0.146	0.59	0.051	0.653	0.179	0.365
Departure Headway (Hd)	6.913	6.287	5.503	6.188	5.315	6.309
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	522	571	646	581	670	567
Service Time	4.913	4.061	3.276	3.956	3.083	4.394
HCM Lane V/C Ratio	0.146	0.592	0.051	0.654	0.181	0.367
HCM Control Delay	11.1	17.8	8.6	20	9.3	13
HCM Lane LOS	B	C	A	C	A	B
HCM 95th-tile Q	0.5	3.8	0.2	4.7	0.6	1.7

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	70	54	51
Future Vol, veh/h	0	70	54	51
Peak Hour Factor	0.92	0.84	0.84	0.84
Heavy Vehicles, %	2	3	2	0
Mvmt Flow	0	83	64	61
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	13
HCM LOS	B

Lane

Intersection	
Int Delay, s/veh	3.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	15	51	73	18	46	102
Future Vol, veh/h	15	51	73	18	46	102
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	75	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	7	12	4	11	2	4
Mvmt Flow	16	54	77	19	48	107

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	290	86	0	0	96	0
Stage 1	86	-	-	-	-	-
Stage 2	204	-	-	-	-	-
Critical Hdwy	6.47	6.32	-	-	4.12	-
Critical Hdwy Stg 1	5.47	-	-	-	-	-
Critical Hdwy Stg 2	5.47	-	-	-	-	-
Follow-up Hdwy	3.563	3.408	-	-	2.218	-
Pot Cap-1 Maneuver	690	946	-	-	1498	-
Stage 1	925	-	-	-	-	-
Stage 2	818	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	667	946	-	-	1498	-
Mov Cap-2 Maneuver	667	-	-	-	-	-
Stage 1	925	-	-	-	-	-
Stage 2	790	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.3	0	2.3
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	667	946	1498	-
HCM Lane V/C Ratio	-	-	0.024	0.057	0.032	-
HCM Control Delay (s)	-	-	10.5	9	7.5	0
HCM Lane LOS	-	-	B	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0.2	0.1	-

Intersection	
Intersection Delay, s/veh	18
Intersection LOS	C

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	5	227	111	0	39	228	2	0	116	25	47
Future Vol, veh/h	0	5	227	111	0	39	228	2	0	116	25	47
Peak Hour Factor	0.92	0.77	0.77	0.77	0.92	0.77	0.77	0.77	0.92	0.77	0.77	0.77
Heavy Vehicles, %	2	4	2	0	2	50	2	3	2	2	4	5
Mvmt Flow	0	6	295	144	0	51	296	3	0	151	32	61
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	19.3	20.3	14.1
HCM LOS	C	C	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	62%	1%	14%	6%
Vol Thru, %	13%	66%	85%	92%
Vol Right, %	25%	32%	1%	2%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	188	343	269	51
LT Vol	116	5	39	3
Through Vol	25	227	228	47
RT Vol	47	111	2	1
Lane Flow Rate	244	445	349	66
Geometry Grp	1	1	1	1
Degree of Util (X)	0.428	0.675	0.632	0.128
Departure Headway (Hd)	6.307	5.455	6.514	6.943
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	566	655	552	519
Service Time	4.407	3.539	4.603	4.943
HCM Lane V/C Ratio	0.431	0.679	0.632	0.127
HCM Control Delay	14.1	19.3	20.3	11
HCM Lane LOS	B	C	C	B
HCM 95th-tile Q	2.1	5.2	4.4	0.4

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	3	47	1
Future Vol, veh/h	0	3	47	1
Peak Hour Factor	0.92	0.77	0.77	0.77
Heavy Vehicles, %	2	0	9	0
Mvmt Flow	0	4	61	1
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	11
HCM LOS	B

Lane

Intersection	
Intersection Delay, s/veh	10.7
Intersection LOS	B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	28	177	13	0	12	253	52	0	23	51	4	0	62	59	24
Future Vol, veh/h	0	28	177	13	0	12	253	52	0	23	51	4	0	62	59	24
Peak Hour Factor	0.92	0.95	0.95	0.95	0.92	0.95	0.95	0.95	0.92	0.95	0.95	0.95	0.92	0.95	0.95	0.95
Heavy Vehicles, %	2	0	5	0	2	0	3	0	2	4	4	0	2	0	2	0
Mvmt Flow	0	29	186	14	0	13	266	55	0	24	54	4	0	65	62	25
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	10.3	11.5	9.5	10
HCM LOS	B	B	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	29%	13%	4%	43%
Vol Thru, %	65%	81%	80%	41%
Vol Right, %	5%	6%	16%	17%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	78	218	317	145
LT Vol	23	28	12	62
Through Vol	51	177	253	59
RT Vol	4	13	52	24
Lane Flow Rate	82	229	334	153
Geometry Grp	1	1	1	1
Degree of Util (X)	0.129	0.313	0.437	0.23
Departure Headway (Hd)	5.665	5.018	4.717	5.424
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	636	721	754	665
Service Time	3.67	3.018	2.81	3.428
HCM Lane V/C Ratio	0.129	0.318	0.443	0.23
HCM Control Delay	9.5	10.3	11.5	10
HCM Lane LOS	A	B	B	A
HCM 95th-tile Q	0.4	1.3	2.2	0.9

Intersection	
Int Delay, s/veh	6.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	9	54	63	9	72	16	119	154	8	32	156	6
Future Vol, veh/h	9	54	63	9	72	16	119	154	8	32	156	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	98	98	98	98	98	98	98	98	98	98	98	98
Heavy Vehicles, %	0	2	3	0	1	0	3	0	13	0	0	17
Mvmt Flow	9	55	64	9	73	16	121	157	8	33	159	6

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	677	636	162	691	635	161	165	0	0	165	0	0
Stage 1	228	228	-	404	404	-	-	-	-	-	-	-
Stage 2	449	408	-	287	231	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.52	6.23	7.1	6.51	6.2	4.13	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.52	-	6.1	5.51	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.52	-	6.1	5.51	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4.018	3.327	3.5	4.009	3.3	2.227	-	-	2.2	-	-
Pot Cap-1 Maneuver	369	395	880	362	397	889	1407	-	-	1426	-	-
Stage 1	779	715	-	627	601	-	-	-	-	-	-	-
Stage 2	593	597	-	725	715	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	277	348	880	269	350	889	1407	-	-	1426	-	-
Mov Cap-2 Maneuver	277	348	-	269	350	-	-	-	-	-	-	-
Stage 1	705	696	-	567	544	-	-	-	-	-	-	-
Stage 2	456	540	-	603	696	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	15.1	17.9	3.3	1.3
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1407	-	-	486	377	1426	-	-
HCM Lane V/C Ratio	0.086	-	-	0.265	0.263	0.023	-	-
HCM Control Delay (s)	7.8	0	-	15.1	17.9	7.6	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0.3	-	-	1.1	1	0.1	-	-

Intersection	
Int Delay, s/veh	2.9

Movement	NBL	NBT	SBT	SBR	NEL	NER
Traffic Vol, veh/h	8	62	60	38	58	5
Future Vol, veh/h	8	62	60	38	58	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	67	65	41	63	5

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	107	0	-	0	171	86
Stage 1	-	-	-	-	86	-
Stage 2	-	-	-	-	85	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1484	-	-	-	819	973
Stage 1	-	-	-	-	937	-
Stage 2	-	-	-	-	938	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1484	-	-	-	814	973
Mov Cap-2 Maneuver	-	-	-	-	814	-
Stage 1	-	-	-	-	937	-
Stage 2	-	-	-	-	932	-

Approach	NB	SB	NE
HCM Control Delay, s	0.9	0	9.8
HCM LOS			A

Minor Lane/Major Mvmt	NELn1	NBL	NBT	SBT	SBR
Capacity (veh/h)	825	1484	-	-	-
HCM Lane V/C Ratio	0.083	0.006	-	-	-
HCM Control Delay (s)	9.8	7.4	0	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.3	0	-	-	-

Intersection	
Intersection Delay, s/veh	8.5
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	0	66	10	0	15	79	12	0	14	83	23
Future Vol, veh/h	0	0	66	10	0	15	79	12	0	14	83	23
Peak Hour Factor	0.92	0.81	0.81	0.81	0.92	0.81	0.81	0.81	0.92	0.81	0.81	0.81
Heavy Vehicles, %	2	3	12	0	2	7	1	0	2	0	1	4
Mvmt Flow	0	0	81	12	0	19	98	15	0	17	102	28
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	8.4	8.6	8.5
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	12%	0%	14%	12%
Vol Thru, %	69%	87%	75%	88%
Vol Right, %	19%	13%	11%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	120	76	106	65
LT Vol	14	0	15	8
Through Vol	83	66	79	57
RT Vol	23	10	12	0
Lane Flow Rate	148	94	131	80
Geometry Grp	1	1	1	1
Degree of Util (X)	0.183	0.123	0.168	0.103
Departure Headway (Hd)	4.44	4.708	4.619	4.631
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	809	761	776	774
Service Time	2.465	2.737	2.647	2.66
HCM Lane V/C Ratio	0.183	0.124	0.169	0.103
HCM Control Delay	8.5	8.4	8.6	8.2
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.7	0.4	0.6	0.3

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	8	57	0
Future Vol, veh/h	0	8	57	0
Peak Hour Factor	0.92	0.81	0.81	0.81
Heavy Vehicles, %	2	0	4	6
Mvmt Flow	0	10	70	0
Number of Lanes	0	0	1	0

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

Lane

Intersection	
Int Delay, s/veh	3.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	10	39	15	15	50	12	17	201	23	36	230	13
Future Vol, veh/h	10	39	15	15	50	12	17	201	23	36	230	13
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	50	-	-	250	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	10	41	16	16	52	13	18	209	24	38	240	14

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	610	590	246	606	585	221	253	0	0	233	0	0
Stage 1	321	321	-	257	257	-	-	-	-	-	-	-
Stage 2	289	269	-	349	328	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	409	423	798	412	426	824	1324	-	-	1346	-	-
Stage 1	695	655	-	752	699	-	-	-	-	-	-	-
Stage 2	723	690	-	671	651	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	352	405	798	361	408	824	1324	-	-	1346	-	-
Mov Cap-2 Maneuver	352	405	-	361	408	-	-	-	-	-	-	-
Stage 1	686	637	-	742	689	-	-	-	-	-	-	-
Stage 2	649	681	-	599	633	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14.5	15.3	0.5	1
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1324	-	-	446	431	1346	-	-
HCM Lane V/C Ratio	0.013	-	-	0.149	0.186	0.028	-	-
HCM Control Delay (s)	7.8	-	-	14.5	15.3	7.8	-	-
HCM Lane LOS	A	-	-	B	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.5	0.7	0.1	-	-

Intersection	
Int Delay, s/veh	5.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	256	343	246	26	33	305
Future Vol, veh/h	256	343	246	26	33	305
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Yield
Storage Length	175	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	301	404	289	31	39	359

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	320	0	-	0	1311	305
Stage 1	-	-	-	-	305	-
Stage 2	-	-	-	-	1006	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1251	-	-	-	177	740
Stage 1	-	-	-	-	752	-
Stage 2	-	-	-	-	357	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1251	-	-	-	134	740
Mov Cap-2 Maneuver	-	-	-	-	134	-
Stage 1	-	-	-	-	752	-
Stage 2	-	-	-	-	271	-

Approach	EB	WB	SB
HCM Control Delay, s	3.8	0	13.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1251	-	-	-	820
HCM Lane V/C Ratio	0.241	-	-	-	0.485
HCM Control Delay (s)	8.8	-	-	-	13.5
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.9	-	-	-	2.7

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	7	0	140	0	0	0	0	167	123	6	204	0
Future Vol, veh/h	7	0	140	0	0	0	0	167	123	6	204	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	0	0	8	0	0	0	0	1	1	0	1	0
Mvmt Flow	8	0	159	0	0	0	0	190	140	7	232	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	505	575	232	232	0	0	330	0	0
Stage 1	245	245	-	-	-	-	-	-	-
Stage 2	260	330	-	-	-	-	-	-	-
Critical Hdwy	6.4	6.5	6.28	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	5.4	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.4	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.372	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	530	431	792	1348	-	-	1241	-	-
Stage 1	800	707	-	-	-	-	-	-	-
Stage 2	788	649	-	-	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	527	0	792	1348	-	-	1241	-	-
Mov Cap-2 Maneuver	527	0	-	-	-	-	-	-	-
Stage 1	795	0	-	-	-	-	-	-	-
Stage 2	788	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.9	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	SBL	SBT	SBR
Capacity (veh/h)	1348	-	-	773	1241	-	-
HCM Lane V/C Ratio	-	-	-	0.216	0.005	-	-
HCM Control Delay (s)	0	-	-	10.9	7.9	0	-
HCM Lane LOS	A	-	-	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.8	0	-	-

Intersection	
Int Delay, s/veh	5.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	0	0	165	0	4	135	39	0	0	45	10
Future Vol, veh/h	0	0	0	165	0	4	135	39	0	0	45	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	0	0	0	3	0	0	1	0	0	0	0	0
Mvmt Flow	0	0	0	188	0	5	153	44	0	0	51	11

Major/Minor	Minor1			Major1			Minor2		
Conflicting Flow All	382	351	44	0	0	0	353	351	0
Stage 1	351	351	-	-	-	-	0	0	-
Stage 2	31	0	-	-	-	-	353	351	-
Critical Hdwy	6.43	6.5	6.2	-	-	-	6.4	6.5	-
Critical Hdwy Stg 1	5.43	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.4	5.5	-
Follow-up Hdwy	3.527	4	3.3	-	-	-	3.5	4	-
Pot Cap-1 Maneuver	618	577	1032	-	-	-	649	577	-
Stage 1	710	636	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	716	636	-
Platoon blocked, %					-	-			
Mov Cap-1 Maneuver	618	0	1032	-	-	-	649	0	-
Mov Cap-2 Maneuver	618	0	-	-	-	-	649	0	-
Stage 1	710	0	-	-	-	-	-	0	-
Stage 2	-	0	-	-	-	-	716	0	-

Approach	WB	NB	SB
HCM Control Delay, s	13.3		
HCM LOS	B		-

Minor Lane/Major Mvmt	NBL	NBT	NBR	WBLn1	SBLn1
Capacity (veh/h)	-	-	-	624	-
HCM Lane V/C Ratio	-	-	-	0.308	-
HCM Control Delay (s)	-	-	-	13.3	-
HCM Lane LOS	-	-	-	B	-
HCM 95th %tile Q(veh)	-	-	-	1.3	-

Intersection	
Int Delay, s/veh	3.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR	SEL	SER
Traffic Vol, veh/h	78	62	1	29	29	61	0	1
Future Vol, veh/h	78	62	1	29	29	61	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Stop	Stop	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	-	-	-
Storage Length	0	-	0	-	-	0	-	0
Veh in Median Storage, #	0	-	-	0	0	-	0	-
Grade, %	0	-	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	0	0	5	0	0
Mvmt Flow	87	69	1	32	32	68	0	1

Major/Minor	Major1		Minor1		Major2		Minor2	
Conflicting Flow All	69	0	309	301	0	0	317	68
Stage 1	-	-	168	168	-	-	133	-
Stage 2	-	-	141	133	-	-	184	-
Critical Hdwy	4.1	-	7.1	6.5	-	-	7.1	6.2
Critical Hdwy Stg 1	-	-	6.1	5.5	-	-	6.1	-
Critical Hdwy Stg 2	-	-	6.1	5.5	-	-	6.1	-
Follow-up Hdwy	2.2	-	3.5	4	-	-	3.5	3.3
Pot Cap-1 Maneuver	1545	-	647	615	-	-	640	1001
Stage 1	-	-	839	763	-	-	875	-
Stage 2	-	-	867	790	-	-	822	-
Platoon blocked, %		-			-	-		
Mov Cap-1 Maneuver	1545	-	617	591	-	-	599	1001
Mov Cap-2 Maneuver	-	-	617	591	-	-	599	-
Stage 1	-	-	826	751	-	-	861	-
Stage 2	-	-	833	772	-	-	780	-

Approach	EB	NB	SB	SE
HCM Control Delay, s	1	10.3	2.4	8.8
HCM LOS		B		A

Minor Lane/Major Mvmt	NBLn1	EBL2	EBL	EBR	SELn1	SBT	SBR	SBR2
Capacity (veh/h)	740	1545	-	-	952	1436	-	-
HCM Lane V/C Ratio	0.089	0.015	-	-	0.018	0.022	-	-
HCM Control Delay (s)	10.3	7.4	0	-	8.8	7.6	0	-
HCM Lane LOS	B	A	A	-	A	A	A	-
HCM 95th %tile Q(veh)	0.3	0	-	-	0.1	0.1	-	-

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Traffic Vol, veh/h	0	0	0	0	174	0	0	0	48	0	0	0
Future Vol, veh/h	0	0	0	0	174	0	0	0	48	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	92	92	92	92	92	92
Heavy Vehicles, %	0	1	0	0	1	0	2	2	2	2	2	2
Mvmt Flow	0	0	0	0	202	0	0	0	52	0	0	0

Major/Minor	Major2			Minor1		
Conflicting Flow All	0	0	0	202	202	0
Stage 1	-	-	-	0	0	-
Stage 2	-	-	-	202	202	-
Critical Hdwy	-	-	-	7.12	6.52	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.12	5.52	-
Follow-up Hdwy	-	-	-	3.518	4.018	-
Pot Cap-1 Maneuver	-	-	-	756	694	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	800	734	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	-	-	-	756	0	-
Mov Cap-2 Maneuver	-	-	-	756	0	-
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	800	0	-

Approach	WB	NE
HCM Control Delay, s	0	
HCM LOS		-

Minor Lane/Major Mvmt	NELn1	WBL	WBT	WBR
Capacity (veh/h)	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	-	0	-	-
HCM Lane LOS	-	A	-	-
HCM 95th %tile Q(veh)	-	-	-	-

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	SBL	SBR	NWL	NWR
Traffic Vol, veh/h	240	161	145	109	100	0
Future Vol, veh/h	240	161	145	109	100	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Stop	Stop	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	175	0	0	100	0	-
Veh in Median Storage, #	0	-	0	-	0	-
Grade, %	0	-	0	-	0	-
Peak Hour Factor	90	90	90	90	92	92
Heavy Vehicles, %	1	0	3	1	2	2
Mvmt Flow	267	179	161	121	109	0

Major/Minor	Major1		Minor2		Major2	
Conflicting Flow All	0	0	0	0	0	-
Stage 1	-	-	0	-	-	-
Stage 2	-	-	0	-	-	-
Critical Hdwy	-	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-
Pot Cap-1 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %		-				-
Mov Cap-1 Maneuver	-	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	SB	NW
HCM Control Delay, s			
HCM LOS		-	

Minor Lane/Major Mvmt	NWL	NWR	EBL	EBR	SBLn1	SBLn2
Capacity (veh/h)	-	-	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-	-
HCM Control Delay (s)	-	-	-	-	-	-
HCM Lane LOS	-	-	-	-	-	-
HCM 95th %tile Q(veh)	-	-	-	-	-	-

Intersection	
Int Delay, s/veh	8.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	60	23	20	77	29	75	20	110	0	86	162	58
Future Vol, veh/h	60	23	20	77	29	75	20	110	0	86	162	58
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	175	-	-	260	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	0	5	2	1	0	0	0	8	6	0	3	1
Mvmt Flow	68	26	23	88	33	85	23	125	0	98	184	66

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	643	583	217	607	615	125	250	0	0	125	0	0
Stage 1	413	413	-	170	170	-	-	-	-	-	-	-
Stage 2	230	170	-	437	445	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.55	6.22	7.11	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.55	-	6.11	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.55	-	6.11	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4.045	3.318	3.509	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	389	420	823	410	409	931	1327	-	-	1474	-	-
Stage 1	620	588	-	834	762	-	-	-	-	-	-	-
Stage 2	777	752	-	600	578	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	309	385	823	354	375	931	1327	-	-	1474	-	-
Mov Cap-2 Maneuver	309	385	-	354	375	-	-	-	-	-	-	-
Stage 1	609	549	-	820	749	-	-	-	-	-	-	-
Stage 2	663	739	-	519	540	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	19.2	17.9	1.2	2.1
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1327	-	-	370	482	1474	-	-
HCM Lane V/C Ratio	0.017	-	-	0.316	0.427	0.066	-	-
HCM Control Delay (s)	7.8	-	-	19.2	17.9	7.6	-	-
HCM Lane LOS	A	-	-	C	C	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	1.3	2.1	0.2	-	-

Intersection	
Int Delay, s/veh	13.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	256	0	92	0	0	0	0	352	33	41	162	0
Future Vol, veh/h	256	0	92	0	0	0	0	352	33	41	162	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	5	0	1	0	0	0	0	2	3	13	2	0
Mvmt Flow	275	0	99	0	0	0	0	378	35	44	174	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	658	676	174	174	0	0	414	0	0
Stage 1	262	262	-	-	-	-	-	-	-
Stage 2	396	414	-	-	-	-	-	-	-
Critical Hdwy	6.45	6.5	6.21	4.1	-	-	4.23	-	-
Critical Hdwy Stg 1	5.45	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.45	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4	3.309	2.2	-	-	2.317	-	-
Pot Cap-1 Maneuver	424	378	872	1415	-	-	1088	-	-
Stage 1	775	695	-	-	-	-	-	-	-
Stage 2	673	597	-	-	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	405	0	872	1415	-	-	1088	-	-
Mov Cap-2 Maneuver	405	0	-	-	-	-	-	-	-
Stage 1	740	0	-	-	-	-	-	-	-
Stage 2	673	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	36	0	1.7
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	SBL	SBT	SBR
Capacity (veh/h)	1415	-	-	472	1088	-	-
HCM Lane V/C Ratio	-	-	-	0.793	0.041	-	-
HCM Control Delay (s)	0	-	-	36	8.4	0	-
HCM Lane LOS	A	-	-	E	A	A	-
HCM 95th %tile Q(veh)	0	-	-	7.2	0.1	-	-

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	0	0	25	1	99	78	530	0	0	178	307
Future Vol, veh/h	0	0	0	25	1	99	78	530	0	0	178	307
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Stop	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	0	0	4	7	3	0	0	5	6
Mvmt Flow	0	0	0	27	1	109	86	582	0	0	196	337

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	1118	1287	582	533	0	0	582	0	0
Stage 1	754	754	-	-	-	-	-	-	-
Stage 2	364	533	-	-	-	-	-	-	-
Critical Hdwy	6.4	6.5	6.24	4.17	-	-	4.1	-	-
Critical Hdwy Stg 1	5.4	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.4	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.336	2.263	-	-	2.2	-	-
Pot Cap-1 Maneuver	231	166	509	1010	-	-	1002	-	-
Stage 1	468	420	-	-	-	-	-	-	-
Stage 2	707	528	-	-	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	202	0	509	1010	-	-	1002	-	-
Mov Cap-2 Maneuver	202	0	-	-	-	-	-	-	-
Stage 1	409	0	-	-	-	-	-	-	-
Stage 2	707	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.1	1.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1010	-	-	643	1002	-	-
HCM Lane V/C Ratio	0.085	-	-	0.214	-	-	-
HCM Control Delay (s)	8.9	0	-	12.1	0	-	-
HCM Lane LOS	A	A	-	B	A	-	-
HCM 95th %tile Q(veh)	0.3	-	-	0.8	0	-	-

Intersection	
Int Delay, s/veh	1.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	38	38	544	85	19	447
Future Vol, veh/h	38	38	544	85	19	447
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	None
Storage Length	0	-	-	-	50	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	5	3	0	0	5
Mvmt Flow	41	41	585	91	20	481

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1153	631	0	0	676	0
Stage 1	631	-	-	-	-	-
Stage 2	522	-	-	-	-	-
Critical Hdwy	6.4	6.25	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.345	-	-	2.2	-
Pot Cap-1 Maneuver	220	476	-	-	925	-
Stage 1	534	-	-	-	-	-
Stage 2	599	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	215	476	-	-	925	-
Mov Cap-2 Maneuver	215	-	-	-	-	-
Stage 1	534	-	-	-	-	-
Stage 2	586	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.3	0	0.4
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	430	925	-
HCM Lane V/C Ratio	-	-	0.19	0.022	-
HCM Control Delay (s)	-	-	15.3	9	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	0.7	0.1	-

Intersection	
Int Delay, s/veh	4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	38	180	152	430	286	12
Future Vol, veh/h	38	180	152	430	286	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	75	0	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	1	1	4	9	0
Mvmt Flow	41	196	165	467	311	13

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1115	317	324	0	-	0
Stage 1	317	-	-	-	-	-
Stage 2	798	-	-	-	-	-
Critical Hdwy	6.4	6.21	4.11	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.309	2.209	-	-	-
Pot Cap-1 Maneuver	232	726	1241	-	-	-
Stage 1	743	-	-	-	-	-
Stage 2	447	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	201	726	1241	-	-	-
Mov Cap-2 Maneuver	201	-	-	-	-	-
Stage 1	743	-	-	-	-	-
Stage 2	388	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.5	2.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1241	-	201	726	-	-
HCM Lane V/C Ratio	0.133	-	0.205	0.269	-	-
HCM Control Delay (s)	8.3	-	27.5	11.8	-	-
HCM Lane LOS	A	-	D	B	-	-
HCM 95th %tile Q(veh)	0.5	-	0.7	1.1	-	-

Appendix G Queuing Worksheets

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	32	569	27	511	154	130	38	258	292
v/c Ratio	0.07	0.67	0.07	0.59	0.19	0.33	0.07	0.65	0.50
Control Delay	7.0	17.8	6.9	16.0	3.3	20.3	0.5	28.2	8.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.0	17.8	6.9	16.0	3.3	20.3	0.5	28.2	8.8
Queue Length 50th (ft)	4	102	3	88	0	28	0	63	13
Queue Length 95th (ft)	15	314	14	268	30	89	2	175	81
Internal Link Dist (ft)		703		1481		491		582	
Turn Bay Length (ft)	250		150		175		175		60
Base Capacity (vph)	565	1161	670	1337	1170	684	883	715	876
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.49	0.04	0.38	0.13	0.19	0.04	0.36	0.33

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBT
Lane Group Flow (vph)	16	143	384	239	83	250	74	201
v/c Ratio	0.04	0.37	0.60	0.26	0.10	0.66	0.14	0.42
Control Delay	10.1	19.8	14.2	11.9	4.2	26.4	4.7	18.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.1	19.8	14.2	11.9	4.2	26.4	4.7	18.3
Queue Length 50th (ft)	2	31	71	39	0	73	0	51
Queue Length 95th (ft)	12	83	170	131	25	146	22	104
Internal Link Dist (ft)		430		634		582		810
Turn Bay Length (ft)	125		425		425		25	
Base Capacity (vph)	723	1262	666	1324	1148	697	922	879
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.11	0.58	0.18	0.07	0.36	0.08	0.23

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	98	359	135	48	249	2	178	104	24	344
v/c Ratio	0.22	0.54	0.21	0.13	0.43	0.00	0.48	0.15	0.05	0.75
Control Delay	16.4	27.4	5.6	16.0	28.2	0.0	20.0	16.1	15.5	33.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.4	27.4	5.6	16.0	28.2	0.0	20.0	16.1	15.5	33.2
Queue Length 50th (ft)	26	146	0	12	97	0	51	21	6	112
Queue Length 95th (ft)	73	307	43	41	217	0	119	75	24	265
Internal Link Dist (ft)		1481			965			356		1149
Turn Bay Length (ft)	100					75	100			
Base Capacity (vph)	547	914	853	549	932	843	558	1094	648	954
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.39	0.16	0.09	0.27	0.00	0.32	0.10	0.04	0.36

Intersection Summary

Lane Group	EBT	NBT	SBL	SBT
Lane Group Flow (vph)	801	125	48	78
v/c Ratio	0.73	0.23	0.17	0.08
Control Delay	30.1	17.4	32.9	9.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	30.1	17.4	32.9	9.3
Queue Length 50th (ft)	201	38	23	19
Queue Length 95th (ft)	262	77	53	38
Internal Link Dist (ft)	364	557		202
Turn Bay Length (ft)			45	
Base Capacity (vph)	1096	551	285	969
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.73	0.23	0.17	0.08

Intersection Summary

Lane Group	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	58	719	139	112
v/c Ratio	0.07	0.47	0.24	0.17
Control Delay	9.7	12.5	15.7	9.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	9.7	12.5	15.7	9.5
Queue Length 50th (ft)	12	94	38	17
Queue Length 95th (ft)	29	136	75	47
Internal Link Dist (ft)		390	202	385
Turn Bay Length (ft)	40			
Base Capacity (vph)	806	1539	586	654
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.07	0.47	0.24	0.17

Intersection Summary

Appendix H Freeway Operations Summary and Worksheets

BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*Marjorie Ludet*
Agency or Company	
Date Performed	*11/11/2015*
Analysis Time Period	

Site Information

Highway/Direction of Travel	*I-84/WB*
From/To	*Exit 85/Exit 86*
Jurisdiction	*The Dalles*
Analysis Year	*2015*

Project Description *The Dalles TSP*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*1340*	veh/h	Peak-Hour Factor, PHF	*0.95*
AADT		veh/day	%Trucks and Buses, P_T	*25*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.889*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*793*	pc/h/ln
S	*65.0*	mph
D = v_p / S	*12.2*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*Marjorie Ludet*
Agency or Company	
Date Performed	*11/11/2015*
Analysis Time Period	

Site Information

Highway/Direction of Travel	*I-84/EB*
From/To	*Exit 85/Exit 86*
Jurisdiction	*The Dalles*
Analysis Year	*2015*

Project Description *The Dalles TSP*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*1440*	veh/h	Peak-Hour Factor, PHF	*0.95*
AADT		veh/day	%Trucks and Buses, P_T	*25*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.889*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*853*	pc/h/ln
S	*65.0*	mph
D = v_p / S	*13.1*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*Marjorie Ludet*
Agency or Company	
Date Performed	*11/11/2015*
Analysis Time Period	

Site Information

Highway/Direction of Travel	*I-84/WB*
From/To	*Exit 84/Exit 85*
Jurisdiction	*The Dalles*
Analysis Year	*2015*

Project Description *The Dalles TSP*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*1300*	veh/h	Peak-Hour Factor, PHF	*0.95*
AADT		veh/day	%Trucks and Buses, P_T	*25*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.889*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*770*	pc/h/ln
S	*65.0*	mph
D = v_p / S	*11.8*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*Marjorie Ludet*
Agency or Company	
Date Performed	*11/11/2015*
Analysis Time Period	

Site Information

Highway/Direction of Travel	*I-84/EB*
From/To	*Exit 84/Exit 85*
Jurisdiction	*The Dalles*
Analysis Year	*2015*

Project Description *The Dalles TSP*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*1600*	veh/h	Peak-Hour Factor, PHF	*0.95*
AADT		veh/day	%Trucks and Buses, P_T	*25*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.889*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*947*	pc/h/ln
S	*65.0*	mph
D = v_p / S	*14.6*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*Marjorie Ludet*
Agency or Company	
Date Performed	*11/11/2015*
Analysis Time Period	

Site Information

Highway/Direction of Travel	*I-84/WB*
From/To	*Exit 83/Exit 84*
Jurisdiction	*The Dalles*
Analysis Year	*2015*

Project Description *The Dalles TSP*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*880*	veh/h	Peak-Hour Factor, PHF	*0.95*
AADT		veh/day	%Trucks and Buses, P_T	*25*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.889*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*521*	pc/h/ln
S	*65.0*	mph
D = v_p / S	*8.0*	pc/mi/ln
LOS	*A*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*Marjorie Ludet*
Agency or Company	
Date Performed	*11/11/2015*
Analysis Time Period	

Site Information

Highway/Direction of Travel	*I-84/EB*
From/To	*Exit 83/Exit 84*
Jurisdiction	*The Dalles*
Analysis Year	*2015*

Project Description *The Dalles TSP*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*1870*	veh/h	Peak-Hour Factor, PHF	*0.95*
AADT		veh/day	%Trucks and Buses, P_T	*25*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.889*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1107*	pc/h/ln
S	*65.0*	mph
D = v_p / S	*17.0*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*Marjorie Ludet*
Agency or Company	
Date Performed	*11/11/2015*
Analysis Time Period	

Site Information

Highway/Direction of Travel	*I-84/WB*
From/To	*Exit 82/Exit 83*
Jurisdiction	*The Dalles*
Analysis Year	*2015*

Project Description *The Dalles TSP*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*1200*	veh/h	Peak-Hour Factor, PHF	*0.95*
AADT		veh/day	%Trucks and Buses, P_T	*25*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.889*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*711*	pc/h/ln
S	*65.0*	mph
D = v_p / S	*10.9*	pc/mi/ln
LOS	*A*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*Marjorie Ludet*
Agency or Company	
Date Performed	*11/11/2015*
Analysis Time Period	

Site Information

Highway/Direction of Travel	*I-84/EB*
From/To	*Exit 82/Exit 83*
Jurisdiction	*The Dalles*
Analysis Year	*2015*

Project Description *The Dalles TSP*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*1180*	veh/h	Peak-Hour Factor, PHF	*0.95*
AADT		veh/day	%Trucks and Buses, P_T	*25*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.889*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*699*	pc/h/ln
S	*65.0*	mph
D = v_p / S	*10.8*	pc/mi/ln
LOS	*A*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	Marjorie Ludet	Freeway/Dir of Travel	I-84/WB
Agency or Company	Kittelson	Junction	On Ramp: Chenowith - Exit 82
Date Performed	11/11/2015	Jurisdiction	The Dalles
Analysis Time Period		Analysis Year	2015

Project Description The Dalles TSP

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	2	Downstream Adj Ramp
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☐ Yes ☐ On
☑ No	☐ Off	Acceleration Lane Length, L_A	1200	☑ No ☐ Off
L_{up} =	ft	Deceleration Lane Length L_D		L_{down} = ft
V_u =	veh/h	Freeway Volume, V_F	1090	V_D = veh/h
		Ramp Volume, V_R	250	
		Freeway Free-Flow Speed, S_{FF}	65.0	
		Ramp Free-Flow Speed, S_{FR}	35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	1090	0.95	Level	25	0	0.889	1.00	1291
Ramp	250	0.95	Level	25	0	0.889	1.00	296
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1291 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1587	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1587	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 10.2 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.256 (Exibit 13-11)

S_R = 59.1 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = 59.1 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information

Analyst	Marjorie Ludet	Freeway/Dir of Travel	I-84/WB
Agency or Company		Junction	Exit 82
Date Performed	11/11/2015	Jurisdiction	The Dalles
Analysis Time Period		Analysis Year	2015

Project Description The Dalles TSP

Site Information

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	1180
Freeway Volume, V_F	1090
Ramp Volume, V_R	120
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	35.0

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	1090	0.94	Level	25	0	0.889	1.00	1305
Ramp	120	0.79	Level	25	0	0.889	1.00	171
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)
P_{FM} = using Equation (Exhibit 13-6)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)
LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)
S_R= mph (Exhibit 13-11)
S_0= mph (Exhibit 13-11)
S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)
P_{FD} = 1.000 using Equation (Exhibit 13-7)
V_{12} = 1305 pc/h
V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1305	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	1134	Exhibit 13-8	4700	No
V_R	171	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1305	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 4.9 (pc/mi/ln)
LOS = A (Exhibit 13-2)

Speed Determination

D_s = 0.443 (Exhibit 13-12)
S_R= 54.8 mph (Exhibit 13-12)
S_0= N/A mph (Exhibit 13-12)
S = 54.8 mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	Marjorie Ludet	Freeway/Dir of Travel	I-84/EB
Agency or Company	Kittelson	Junction	On Ramp: Chenowith - Exit 82
Date Performed	11/11/2015	Jurisdiction	The Dalles
Analysis Time Period		Analysis Year	2015

Project Description The Dalles TSP

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 2	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 1070	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 1080	
	Ramp Volume, V_R: 160	
	Freeway Free-Flow Speed, S_{FF}: 65.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	1080	0.95	Level	25	0	0.889	1.00	1279
Ramp	160	0.95	Level	25	0	0.889	1.00	189
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1279 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1468	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1468	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 10.1 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.263 (Exibit 13-11)

S_R = 59.0 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = 59.0 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information

Analyst	Marjorie Ludet	Freeway/Dir of Travel	I-84/EB
Agency or Company		Junction	Exit 82
Date Performed	11/11/2015	Jurisdiction	The Dalles
Analysis Time Period		Analysis Year	2015

Project Description The Dalles TSP

Site Information

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	1260
Freeway Volume, V_F	1080
Ramp Volume, V_R	315
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	35.0

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	1080	0.94	Level	25	0	0.889	1.00	1293
Ramp	315	0.82	Level	25	0	0.889	1.00	432
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)
P_{FM} = using Equation (Exhibit 13-6)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)
LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)
S_R= mph (Exhibit 13-11)
S_0= mph (Exhibit 13-11)
S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)
P_{FD} = 1.000 using Equation (Exhibit 13-7)
V_{12} = 1293 pc/h
V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1293	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	861	Exhibit 13-8	4700	No
V_R	432	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1293	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 4.0 (pc/mi/ln)
LOS = A (Exhibit 13-2)

Speed Determination

D_s = 0.467 (Exhibit 13-12)
S_R= 54.3 mph (Exhibit 13-12)
S_0= N/A mph (Exhibit 13-12)
S = 54.3 mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	Marjorie Ludet	Freeway/Dir of Travel	I-84/WB
Agency or Company	Kittelson	Junction	Exit 83
Date Performed	11/11/2015	Jurisdiction	The Dalles
Analysis Time Period		Analysis Year	2015

Project Description The Dalles TSP

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	2	Downstream Adj Ramp
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☐ Yes ☐ On
☑ No	☐ Off	Acceleration Lane Length, L_A	500	☑ No ☐ Off
L_{up} =	ft	Deceleration Lane Length L_D		L_{down} = ft
V_u =	veh/h	Freeway Volume, V_F	880	V_D = veh/h
		Ramp Volume, V_R	330	
		Freeway Free-Flow Speed, S_{FF}	65.0	
		Ramp Free-Flow Speed, S_{FR}	35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	880	0.95	Level	25	0	0.889	1.00	1042
Ramp	330	0.95	Level	25	0	0.889	1.00	391
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1042 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1433	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1433	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 13.3 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.302 (Exibit 13-11)

S_R = 58.0 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = 58.0 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	Marjorie Ludet	Freeway/Dir of Travel	I-84/EB
Agency or Company	Kittelson	Junction	Exit 83
Date Performed	11/11/2015	Jurisdiction	The Dalles
Analysis Time Period		Analysis Year	2015

Project Description The Dalles TSP

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	2	Downstream Adj Ramp
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☐ Yes ☐ On
☑ No	☐ Off	Acceleration Lane Length, L_A	700	☑ No ☐ Off
L_{up} =	ft	Deceleration Lane Length L_D		L_{down} = ft
V_u =	veh/h	Freeway Volume, V_F	1020	V_D = veh/h
		Ramp Volume, V_R	850	
		Freeway Free-Flow Speed, S_{FF}	65.0	
		Ramp Free-Flow Speed, S_{FR}	35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	1020	0.95	Level	25	0	0.889	1.00	1208
Ramp	850	0.95	Level	25	0	0.889	1.00	1007
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1208 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	2215	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	2215	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 17.9 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.308 (Exibit 13-11)

S_R = 57.9 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = 57.9 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information

Analyst	Marjorie Ludet	Freeway/Dir of Travel	I-84/EB
Agency or Company		Junction	Exit 83
Date Performed	11/11/2015	Jurisdiction	The Dalles
Analysis Time Period		Analysis Year	2015
Project Description	The Dalles TSP		

Site Information

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	700
Freeway Volume, V_F	1020
Ramp Volume, V_R	150
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	35.0

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	1020	0.94	Level	25	0	0.889	1.00	1221
Ramp	150	0.95	Level	25	0	0.889	1.00	178
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)
P_{FM} = using Equation (Exhibit 13-6)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)
LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)
S_R = mph (Exhibit 13-11)
S_0 = mph (Exhibit 13-11)
S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)
P_{FD} = 1.000 using Equation (Exhibit 13-7)
V_{12} = 1221 pc/h
V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1221	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	1043	Exhibit 13-8	4700	No
V_R	178	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1221	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 8.5 (pc/mi/ln)
LOS = A (Exhibit 13-2)

Speed Determination

D_s = 0.444 (Exhibit 13-12)
S_R = 54.8 mph (Exhibit 13-12)
S_0 = N/A mph (Exhibit 13-12)
S = 54.8 mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information

Analyst	Marjorie Ludet	Freeway/Dir of Travel	I-84/WB
Agency or Company		Junction	Exit 84
Date Performed	11/11/2015	Jurisdiction	The Dalles
Analysis Time Period		Analysis Year	2015

Project Description The Dalles TSP

Site Information

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	1030
Freeway Volume, V_F	880
Ramp Volume, V_R	415
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	35.0

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	880	0.95	Level	25	0	0.889	1.00	1042
Ramp	415	0.95	Level	25	0	0.889	1.00	491
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)
P_{FM} = using Equation (Exhibit 13-6)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)
LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)
S_R= mph (Exhibit 13-11)
S_0= mph (Exhibit 13-11)
S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)
P_{FD} = 1.000 using Equation (Exhibit 13-7)
V_{12} = 1042 pc/h
V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1042	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	551	Exhibit 13-8	4700	No
V_R	491	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1042	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 3.9 (pc/mi/ln)
LOS = A (Exhibit 13-2)

Speed Determination

D_s = 0.472 (Exhibit 13-12)
S_R= 54.1 mph (Exhibit 13-12)
S_0= N/A mph (Exhibit 13-12)
S = 54.1 mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information

Analyst	Marjorie Ludet	Freeway/Dir of Travel	I-84/EB
Agency or Company		Junction	Exit 84
Date Performed	11/11/2015	Jurisdiction	The Dalles
Analysis Time Period		Analysis Year	2015

Project Description The Dalles TSP

Site Information

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	1050
Freeway Volume, V_F	1600
Ramp Volume, V_R	270
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	35.0

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	1600	0.95	Level	25	0	0.889	1.00	1895
Ramp	270	0.95	Level	25	0	0.889	1.00	320
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)
P_{FM} = using Equation (Exhibit 13-6)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)
LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)
S_R = mph (Exhibit 13-11)
S_0 = mph (Exhibit 13-11)
S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)
P_{FD} = 1.000 using Equation (Exhibit 13-7)
V_{12} = 1895 pc/h
V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1895	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	1575	Exhibit 13-8	4700	No
V_R	320	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1895	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 11.1 (pc/mi/ln)
LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.457 (Exhibit 13-12)
S_R = 54.5 mph (Exhibit 13-12)
S_0 = N/A mph (Exhibit 13-12)
S = 54.5 mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	Marjorie Ludet	Freeway/Dir of Travel	I-84/WB
Agency or Company	Kittelson	Junction	Exit 85
Date Performed	11/11/2015	Jurisdiction	The Dalles
Analysis Time Period		Analysis Year	2015

Project Description The Dalles TSP

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 2	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 1220	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 1090	
	Ramp Volume, V_R: 210	
	Freeway Free-Flow Speed, S_{FF}: 65.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	1090	0.95	Level	25	0	0.889	1.00	1291
Ramp	210	0.88	Level	25	0	0.889	1.00	268
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1291 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1559	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1559	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 9.9 (pc/mi/ln)

LOS = A (Exhibit 13-2)

Speed Determination

M_S = 0.254 (Exibit 13-11)

S_R = 59.2 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = 59.2 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information

Analyst	Marjorie Ludet	Freeway/Dir of Travel	I-84/WB
Agency or Company		Junction	Exit 85
Date Performed	11/11/2015	Jurisdiction	The Dalles
Analysis Time Period		Analysis Year	2015

Project Description The Dalles TSP

Site Information

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	1175
Freeway Volume, V_F	1090
Ramp Volume, V_R	255
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	35.0

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	1090	0.95	Level	25	0	0.889	1.00	1291
Ramp	255	0.88	Level	25	0	0.889	1.00	326
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)
P_{FM} = using Equation (Exhibit 13-6)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)
LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)
S_R= mph (Exhibit 13-11)
S_0= mph (Exhibit 13-11)
S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)
P_{FD} = 1.000 using Equation (Exhibit 13-7)
V_{12} = 1291 pc/h
V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1291	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	965	Exhibit 13-8	4700	No
V_R	326	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1291	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 4.8 (pc/mi/ln)
LOS = A (Exhibit 13-2)

Speed Determination

D_s = 0.457 (Exhibit 13-12)
S_R= 54.5 mph (Exhibit 13-12)
S_0= N/A mph (Exhibit 13-12)
S = 54.5 mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	Marjorie Ludet	Freeway/Dir of Travel	I-84/EB
Agency or Company	Kittelson	Junction	Exit 85
Date Performed	11/11/2015	Jurisdiction	The Dalles
Analysis Time Period		Analysis Year	2015

Project Description The Dalles TSP

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	2	Downstream Adj Ramp
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☐ Yes ☐ On
☑ No	☐ Off	Acceleration Lane Length, L_A	1300	☑ No ☐ Off
L_{up} =	ft	Deceleration Lane Length L_D		L_{down} = ft
V_u =	veh/h	Freeway Volume, V_F	1230	V_D = veh/h
		Ramp Volume, V_R	200	
		Freeway Free-Flow Speed, S_{FF}	65.0	
		Ramp Free-Flow Speed, S_{FR}	35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	1230	0.95	Level	25	0	0.889	1.00	1457
Ramp	200	0.88	Level	25	0	0.889	1.00	256
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1457 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1713	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1713	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 10.6 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.252 (Exibit 13-11)

S_R = 59.2 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = 59.2 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information

Analyst	Marjorie Ludet	Freeway/Dir of Travel	I-84/EB
Agency or Company		Junction	Exit 85
Date Performed	11/11/2015	Jurisdiction	The Dalles
Analysis Time Period		Analysis Year	2015

Project Description The Dalles TSP

Site Information

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	1150
Freeway Volume, V_F	1230
Ramp Volume, V_R	360
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	35.0

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	1230	0.95	Level	25	0	0.889	1.00	1457
Ramp	360	0.88	Level	25	0	0.889	1.00	460
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)
P_{FM} = using Equation (Exhibit 13-6)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)
LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)
S_R= mph (Exhibit 13-11)
S_0= mph (Exhibit 13-11)
S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)
P_{FD} = 1.000 using Equation (Exhibit 13-7)
V_{12} = 1457 pc/h
V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1457	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	997	Exhibit 13-8	4700	No
V_R	460	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1457	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 6.4 (pc/mi/ln)
LOS = A (Exhibit 13-2)

Speed Determination

D_s = 0.469 (Exhibit 13-12)
S_R= 54.2 mph (Exhibit 13-12)
S_0= N/A mph (Exhibit 13-12)
S = 54.2 mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	Marjorie Ludet	Freeway/Dir of Travel	I-84/WB
Agency or Company	Kittelson	Junction	Exit 87
Date Performed	11/11/2015	Jurisdiction	The Dalles
Analysis Time Period		Analysis Year	2015

Project Description The Dalles TSP

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	2	Downstream Adj Ramp
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☐ Yes ☐ On
☑ No	☐ Off	Acceleration Lane Length, L_A	1230	☑ No ☐ Off
L_{up} =	ft	Deceleration Lane Length L_D		L_{down} = ft
V_u =	veh/h	Freeway Volume, V_F	800	V_D = veh/h
		Ramp Volume, V_R	540	
		Freeway Free-Flow Speed, S_{FF}	65.0	
		Ramp Free-Flow Speed, S_{FR}	35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	800	0.95	Level	25	0	0.889	1.00	947
Ramp	540	0.91	Level	25	0	0.889	1.00	668
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 947 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1615	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1615	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 10.1 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.255 (Exibit 13-11)

S_R = 59.1 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = 59.1 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information

Analyst	Marjorie Ludet	Freeway/Dir of Travel	I-84/WB
Agency or Company		Junction	Exit 87
Date Performed	11/11/2015	Jurisdiction	The Dalles
Analysis Time Period		Analysis Year	2015

Project Description The Dalles TSP

Site Information

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	940
Freeway Volume, V_F	800
Ramp Volume, V_R	150
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	35.0

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	800	0.95	Level	25	0	0.889	1.00	947
Ramp	150	0.91	Level	25	0	0.889	1.00	185
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$
L_{EQ} = (Equation 13-6 or 13-7)
P_{FM} = using Equation (Exhibit 13-6)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$
D_R = (pc/mi/ln)
LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)
S_R= mph (Exhibit 13-11)
S_0= mph (Exhibit 13-11)
S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$
L_{EQ} = (Equation 13-12 or 13-13)
P_{FD} = 1.000 using Equation (Exhibit 13-7)
V_{12} = 947 pc/h
V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	947	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	762	Exhibit 13-8	4700	No
V_R	185	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	947	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$
D_R = 3.9 (pc/mi/ln)
LOS = A (Exhibit 13-2)

Speed Determination

D_s = 0.445 (Exhibit 13-12)
S_R= 54.8 mph (Exhibit 13-12)
S_0= N/A mph (Exhibit 13-12)
S = 54.8 mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	Marjorie Ludet	Freeway/Dir of Travel	I-84/EB
Agency or Company	Kittelson	Junction	Exit 87
Date Performed	11/11/2015	Jurisdiction	The Dalles
Analysis Time Period		Analysis Year	2015

Project Description The Dalles TSP

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	2	Downstream Adj Ramp
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☐ Yes ☐ On
☑ No	☐ Off	Acceleration Lane Length, L_A	1500	☑ No ☐ Off
L_{up} =	ft	Deceleration Lane Length L_D		L_{down} = ft
V_u =	veh/h	Freeway Volume, V_F	970	V_D = veh/h
		Ramp Volume, V_R	100	
		Freeway Free-Flow Speed, S_{FF}	65.0	
		Ramp Free-Flow Speed, S_{FR}	35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	970	0.95	Level	25	0	0.889	1.00	1149
Ramp	100	0.93	Level	25	0	0.889	1.00	121
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1149 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1270	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1270	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 5.9 (pc/mi/ln)

LOS = A (Exhibit 13-2)

Speed Determination

M_S = 0.230 (Exibit 13-11)

S_R = 59.7 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = 59.7 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information

Analyst	Marjorie Ludet	Freeway/Dir of Travel	I-84/EB
Agency or Company		Junction	Exit 87
Date Performed	11/11/2015	Jurisdiction	The Dalles
Analysis Time Period		Analysis Year	2015
Project Description	The Dalles TSP		

Site Information

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	2	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☐ Yes	☐ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☑ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	1120	L_{down} =	ft
V_u =	veh/h	Freeway Volume, V_F	970	V_D =	veh/h
		Ramp Volume, V_R	470		
		Freeway Free-Flow Speed, S_{FF}	65.0		
		Ramp Free-Flow Speed, S_{FR}	35.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	970	0.95	Level	25	0	0.889	1.00	1149
Ramp	470	0.93	Level	25	0	0.889	1.00	569
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 1149 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1149	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	580	Exhibit 13-8	4700	No
V_R	569	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1149	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 4.1 (pc/mi/ln)

LOS = A (Exhibit 13-2)

Speed Determination

D_s = 0.479 (Exhibit 13-12)

S_R= 54.0 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 54.0 mph (Exhibit 13-13)

Appendix I Reported Crashes by Study Intersection

Intersection No	Intersection Name	Crash_ID	Crash Month	Crash Year	Collision Type	Highest Severity
4	I-84 EB Ramps/River Rd	1442865	September	2011	Fixed-Object or Other-Object	Inj-B
4	I-84 EB Ramps/River Rd	1490234	November	2012	Turning Movement	Inj-C
4	I-84 EB Ramps/River Rd	1544856	May	2013	Rear-End	PDO
4	I-84 EB Ramps/River Rd	1568406	May	2014	Turning Movement	PDO
5	W 10th St/Hostetler Wy	1585085	August	2014	Turning Movement	PDO
7	I-84 EB Ramps/W 6th St	1392128	August	2010	Non-collision	Inj-B
7	I-84 EB Ramps/W 6th St	1499876	December	2012	Turning Movement	PDO
8	Webber St/W 10th St	1397833	December	2010	Turning Movement	PDO
8	Webber St/W 10th St	1537619	October	2013	Rear-End	PDO
8	Webber St/W 10th St	1584411	August	2014	Turning Movement	PDO
9	Webber St/W 6th St	1356654	January	2010	Rear-End	PDO
9	Webber St/W 6th St	1356741	January	2010	Turning Movement	PDO
9	Webber St/W 6th St	1367339	April	2010	Angle	PDO
9	Webber St/W 6th St	1378284	July	2010	Turning Movement	Inj-B
9	Webber St/W 6th St	1383758	August	2010	Rear-End	PDO
9	Webber St/W 6th St	1386251	September	2010	Rear-End	PDO
9	Webber St/W 6th St	1411101	March	2011	Rear-End	Inj-C
9	Webber St/W 6th St	1423105	May	2011	Rear-End	PDO
9	Webber St/W 6th St	1442190	September	2011	Angle	Inj-A
9	Webber St/W 6th St	1442209	August	2011	Rear-End	PDO
9	Webber St/W 6th St	1442696	November	2011	Rear-End	Inj-C
9	Webber St/W 6th St	1442838	November	2011	Rear-End	Inj-C
9	Webber St/W 6th St	1454434	January	2012	Rear-End	PDO
9	Webber St/W 6th St	1468501	April	2012	Rear-End	PDO
9	Webber St/W 6th St	1474689	July	2012	Angle	PDO
9	Webber St/W 6th St	1481395	August	2012	Rear-End	PDO
9	Webber St/W 6th St	1513180	April	2013	Rear-End	Inj-C
9	Webber St/W 6th St	1533269	August	2013	Angle	PDO
9	Webber St/W 6th St	1534550	September	2013	Turning Movement	PDO
9	Webber St/W 6th St	1541076	December	2013	Rear-End	PDO
9	Webber St/W 6th St	1541242	December	2013	Rear-End	PDO
9	Webber St/W 6th St	1579521	July	2014	Rear-End	PDO
9	Webber St/W 6th St	1579679	July	2014	Rear-End	PDO

Intersection No	Intersection Name	Crash_ID	Crash Month	Crash Year	Collision Type	Highest Severity
9	Webber St/W 6th St	1584158	August	2014	Rear-End	PDO
9	Webber St/W 6th St	1590112	August	2014	Rear-End	PDO
10	Webber St/W 2nd St	1383698	August	2010	Rear-End	PDO
10	Webber St/W 2nd St	1386088	September	2010	Rear-End	Inj-C
10	Webber St/W 2nd St	1386553	October	2010	Angle	PDO
10	Webber St/W 2nd St	1417646	April	2011	Turning Movement	PDO
10	Webber St/W 2nd St	1441841	September	2011	Turning Movement	Inj-C
10	Webber St/W 2nd St	1448174	August	2011	Angle	PDO
10	Webber St/W 2nd St	1468406	April	2012	Turning Movement	PDO
10	Webber St/W 2nd St	1474589	July	2012	Rear-End	PDO
10	Webber St/W 2nd St	1481316	August	2012	Angle	Inj-B
10	Webber St/W 2nd St	1537683	September	2013	Turning Movement	Inj-B
10	Webber St/W 2nd St	1551975	January	2014	Turning Movement	Inj-A
10	Webber St/W 2nd St	1569179	April	2014	Angle	PDO
10	Webber St/W 2nd St	1576334	June	2014	Turning Movement	PDO
10	Webber St/W 2nd St	1590188	September	2014	Rear-End	PDO
12	Cherry Hts Rd/W 10th St	1403068	February	2011	Rear-End	PDO
12	Cherry Hts Rd/W 10th St	1456504	February	2012	Angle	PDO
12	Cherry Hts Rd/W 10th St	1551943	January	2014	Non-collision	PDO
12	Cherry Hts Rd/W 10th St	1551944	January	2014	Non-collision	PDO
12	Cherry Hts Rd/W 10th St	1561466	March	2014	Angle	PDO
12	Cherry Hts Rd/W 10th St	1568946	April	2014	Fixed-Object or Other-Object	PDO
12	Cherry Hts Rd/W 10th St	1576387	June	2014	Turning Movement	PDO
13	Cherry Hts Rd/W 6th St	1356703	January	2010	Rear-End	PDO
13	Cherry Hts Rd/W 6th St	1367171	April	2010	Rear-End	Inj-C
13	Cherry Hts Rd/W 6th St	1386542	September	2010	Rear-End	PDO
13	Cherry Hts Rd/W 6th St	1391773	September	2010	Pedestrian	Inj-B
13	Cherry Hts Rd/W 6th St	1411060	March	2011	Turning Movement	PDO
13	Cherry Hts Rd/W 6th St	1436205	June	2011	Rear-End	Inj-C
13	Cherry Hts Rd/W 6th St	1442444	October	2011	Rear-End	PDO
13	Cherry Hts Rd/W 6th St	1454445	January	2012	Rear-End	Inj-C
13	Cherry Hts Rd/W 6th St	1468500	April	2012	Rear-End	PDO
13	Cherry Hts Rd/W 6th St	1472332	June	2012	Rear-End	PDO

Intersection No	Intersection Name	Crash_ID	Crash Month	Crash Year	Collision Type	Highest Severity
13	Cherry Hts Rd/W 6th St	1481228	August	2012	Rear-End	Inj-C
13	Cherry Hts Rd/W 6th St	1481322	August	2012	Fixed-Object or Other-Object	PDO
13	Cherry Hts Rd/W 6th St	1486275	September	2012	Rear-End	PDO
13	Cherry Hts Rd/W 6th St	1488038	October	2012	Rear-End	PDO
13	Cherry Hts Rd/W 6th St	1499911	December	2012	Rear-End	PDO
13	Cherry Hts Rd/W 6th St	1501178	January	2013	Rear-End	PDO
13	Cherry Hts Rd/W 6th St	1525909	July	2013	Turning Movement	PDO
13	Cherry Hts Rd/W 6th St	1534436	September	2013	Fixed-Object or Other-Object	PDO
13	Cherry Hts Rd/W 6th St	1537676	October	2013	Rear-End	PDO
13	Cherry Hts Rd/W 6th St	1568794	May	2014	Rear-End	Inj-C
16	Union St/10th	1400698	January	2011	Rear-End	PDO
16	Union St/10th	1402971	February	2011	Angle	Inj-C
16	Union St/10th	1417803	April	2011	Turning Movement	PDO
16	Union St/10th	1468439	April	2012	Angle	PDO
16	Union St/10th	1561640	March	2014	Rear-End	PDO
17	Union St/W 3rd St	1367334	April	2010	Angle	PDO
17	Union St/W 3rd St	1411039	March	2011	Fixed-Object or Other-Object	Inj-C
17	Union St/W 3rd St	1533161	August	2013	Angle	PDO
17	Union St/W 3rd St	1576231	May	2014	Turning Movement	PDO
18	Union St/W 2nd St	1378140	July	2010	Turning Movement	PDO
18	Union St/W 2nd St	1383673	August	2010	Rear-End	PDO
18	Union St/W 2nd St	1417876	April	2011	Turning Movement	PDO
18	Union St/W 2nd St	1521720	June	2013	Sideswipe-overtaking	PDO
18	Union St/W 2nd St	1533315	August	2013	Angle	PDO
18	Union St/W 2nd St	1551969	January	2014	Angle	PDO
18	Union St/W 2nd St	1556095	February	2014	Sideswipe-overtaking	Inj-C
18	Union St/W 2nd St	1556481	February	2014	Sideswipe-overtaking	PDO
19	Kelly Ave/E 10th St	1367307	April	2010	Angle	PDO
19	Kelly Ave/E 10th St	1423068	May	2011	Angle	PDO
19	Kelly Ave/E 10th St	1436174	July	2011	Fixed-Object or Other-Object	Inj-C
19	Kelly Ave/E 10th St	1442920	December	2011	Pedestrian	Inj-C
19	Kelly Ave/E 10th St	1525851	July	2013	Angle	Inj-C
19	Kelly Ave/E 10th St	1568498	May	2014	Angle	Inj-B

Intersection No	Intersection Name	Crash_ID	Crash Month	Crash Year	Collision Type	Highest Severity
22	Dry Hollow Rd/E 10th St	1411045	March	2011	Angle	Inj-B
22	Dry Hollow Rd/E 10th St	1443009	December	2011	Turning Movement	PDO
22	Dry Hollow Rd/E 10th St	1474852	July	2012	Turning Movement	PDO
22	Dry Hollow Rd/E 10th St	1501311	January	2013	Angle	PDO
22	Dry Hollow Rd/E 10th St	1501331	January	2013	Angle	Inj-C
22	Dry Hollow Rd/E 10th St	1569185	April	2014	Angle	PDO
23	Brewery Grade/US 30	1472349	June	2012	Sideswipe-meeting	Inj-C
23	Brewery Grade/US 30	1561440	March	2014	Rear-End	PDO
24	Brewery Overpass Rd/US 30	1360927	February	2010	Turning Movement	PDO
24	Brewery Overpass Rd/US 30	1442311	October	2011	Angle	PDO
24	Brewery Overpass Rd/US 30	1533060	August	2013	Rear-End	PDO
24	Brewery Overpass Rd/US 30	1537629	October	2013	Turning Movement	Inj-A
25	Brewery Overpass Rd/I-84 EB Ramps	1392143	October	2010	Fixed-Object or Other-Object	PDO
25	Brewery Overpass Rd/I-84 EB Ramps	1442465	October	2011	Fixed-Object or Other-Object	PDO
25	Brewery Overpass Rd/I-84 EB Ramps	1490145	November	2012	Turning Movement	PDO
26	Brewery Overpass Rd/I-84 WB Ramps	1435970	July	2011	Angle	PDO
27	Thompson St/E 10th St/Old Dufur Rd	1436210	May	2011	Fixed-Object or Other-Object	PDO
28	E 2nd St/US 30	1386526	October	2010	Angle	PDO
28	E 2nd St/US 30	1417858	April	2011	Turning Movement	PDO
29	US 197/US 30	1358426	January	2010	Turning Movement	PDO
29	US 197/US 30	1368532	May	2010	Turning Movement	PDO
29	US 197/US 30	1384214	August	2010	Turning Movement	Inj-C
29	US 197/US 30	1386165	September	2010	Turning Movement	PDO
29	US 197/US 30	1406414	February	2011	Turning Movement	PDO
29	US 197/US 30	1417565	April	2011	Turning Movement	PDO
29	US 197/US 30	1453804	January	2012	Turning Movement	Inj-C
29	US 197/US 30	1463535	March	2012	Turning Movement	PDO
29	US 197/US 30	1468571	May	2012	Non-collision	Inj-C
29	US 197/US 30	1480802	August	2012	Turning Movement	PDO
29	US 197/US 30	1534229	August	2013	Turning Movement	PDO
29	US 197/US 30	1534591	September	2013	Turning Movement	PDO
29	US 197/US 30	1534626	September	2013	Turning Movement	PDO
29	US 197/US 30	1537318	November	2013	Turning Movement	Inj-C

Intersection No	Intersection Name	Crash_ID	Crash Month	Crash Year	Collision Type	Highest Severity
29	US 197/US 30	1579441	July	2014	Turning Movement	PDO
30	US 197/Fremont St/Columbia Vw Dr	1386121	September	2010	Angle	PDO
30	US 197/Fremont St/Columbia Vw Dr	1386556	October	2010	Angle	Inj-C
30	US 197/Fremont St/Columbia Vw Dr	1391921	November	2010	Fixed-Object or Other-Object	PDO
30	US 197/Fremont St/Columbia Vw Dr	1393324	November	2010	Fixed-Object or Other-Object	Inj-C
30	US 197/Fremont St/Columbia Vw Dr	1422777	May	2011	Angle	PDO
30	US 197/Fremont St/Columbia Vw Dr	1436356	May	2011	Pedestrian	Inj-B
30	US 197/Fremont St/Columbia Vw Dr	1468513	May	2012	Turning Movement	PDO
30	US 197/Fremont St/Columbia Vw Dr	1487890	October	2012	Angle	Inj-C
30	US 197/Fremont St/Columbia Vw Dr	1537671	October	2013	Turning Movement	Inj-B
30	US 197/Fremont St/Columbia Vw Dr	1541348	December	2013	Fixed-Object or Other-Object	Inj-A
31	US 197/I-84 EB Ramps	1378343	July	2010	Turning Movement	Inj-C
31	US 197/I-84 EB Ramps	1378399	July	2010	Turning Movement	Inj-B
31	US 197/I-84 EB Ramps	1406434	February	2011	Turning Movement	Inj-B
31	US 197/I-84 EB Ramps	1411147	March	2011	Angle	Inj-C
31	US 197/I-84 EB Ramps	1442941	December	2011	Rear-End	PDO
31	US 197/I-84 EB Ramps	1468361	April	2012	Angle	Inj-B
31	US 197/I-84 EB Ramps	1521577	June	2013	Rear-End	PDO
31	US 197/I-84 EB Ramps	1537327	November	2013	Angle	Inj-C
32	US 197/I-84 WB Ramps	1435846	July	2011	Angle	Inj-C
32	US 197/I-84 WB Ramps	1435926	July	2011	Angle	PDO
32	US 197/I-84 WB Ramps	1453806	January	2012	Rear-End	PDO
32	US 197/I-84 WB Ramps	1579447	July	2014	Rear-End	PDO
32	US 197/I-84 WB Ramps	1594528	October	2014	Turning Movement	Inj-C
33	US 197/Bret Clodfelter Wy	1435853	July	2011	Angle	PDO
33	US 197/Bret Clodfelter Wy	1435946	July	2011	Angle	PDO
33	US 197/Bret Clodfelter Wy	1439473	August	2011	Turning Movement	PDO
33	US 197/Bret Clodfelter Wy	1508502	March	2013	Turning Movement	Inj-A
33	US 197/Bret Clodfelter Wy	1517662	May	2013	Turning Movement	PDO
34	US 197/Lone Pine Ln	1555887	February	2014	Rear-End	PDO
9	Webber St/W 6th St	1599731	December	2014	Rear-End	PDO
30	US 197/Fremont St/Columbia Vw Dr	1599734	December	2014	Angle	Inj-C
30	US 197/Fremont St/Columbia Vw Dr	1599808	December	2014	Angle	PDO

Intersection No	Intersection Name	Crash_ID	Crash Month	Crash Year	Collision Type	Highest Severity
31	US 197/I-84 EB Ramps	1595637	November	2014	Rear-End	Inj-B
32	US 197/I-84 WB Ramps	1599686	November	2014	Rear-End	Inj-C

Appendix J ODOT Critical Crash Rate Calculator Worksheets

General & Site Information	
Analyst:	Marjorie Ludet
Agency/Company:	Kittelson
Date:	10/1/2015
Project Name:	18495 - The Dalles TSP

Intersection Crash Data

Intersection	Intersection Type	Year					Total
		2010	2011	2012	2013	2014	
4	Urban 4ST		1	1	1	1	4
5	Urban 3ST					1	1
7	Urban 3ST	1		1			2
8	Urban 3ST	1			1	1	3
9	Urban 4SG	6	6	4	5	5	26
10	Urban 4SG	3	3	3	1	4	14
12	Urban 4ST		1	1		5	7
13	Urban 4SG	4	3	8	4	1	20
16	Urban 4ST		3	1		1	5
17	Urban 4SG	1	1		1	1	4
18	Urban 4SG	2	1		2	3	8
19	Urban 4ST	1	3		1	1	6
22	Urban 4ST		2	1	2	1	6
23				1		1	2
24	Urban 4ST	1	1		2		4
25	Urban 4ST	1	1	1			3
26	Urban 4ST		1				1
27	Urban 4ST		1				1
28	Urban 4ST	1	1				2
29	Urban 3ST	4	2	4	4	1	15
30	Urban 4ST	4	2	2	2	2	12
31	Urban 4ST	2	3	1	2	1	9
32	Urban 4ST		2	1		3	6
33	Urban 3ST		3		2		5
34	Urban 3ST					1	1
	Total	26	31	26	24	27	134

Intersection Population Type Crash Rate				
Average Crash Rate per intersection type				
Intersection Pop. Type	Sum of Crashes	Sum of 5-year MEV	Avg Crash Rate for Ref Pop.	INT in Pop
Rural 3SG	0	0		
Rural 3ST	0	0		
Rural 4SG	0	0		
Rural 4ST	0	0		
Urban 3ST	27	107	0.2513	6
Urban 3SG	0	0		
Urban 4ST	66	162	0.4076	13
Urban 4SG	72	127	0.5655	5

Critical Rate Calculation								
Intersection	AADT Entering Intersection	5-year MEV	Crash Total	Intersection Population Type	Intersection Crash Rate	Reference Population Crash Rate	Critical Rate	Over Critical
4	3,780	6.9	4	Urban 4ST	0.58	0.41	0.88	Under
5	3,530	6.4	1	Urban 3ST	0.16	0.25	0.65	Under
7	16,100	29.4	2	Urban 3ST	0.07	0.25	0.42	Under
8	7,550	13.8	3	Urban 3ST	0.22	0.25	0.51	Under
9	19,500	35.6	26	Urban 4SG	0.73	0.57	0.79	Under
10	12,230	22.3	14	Urban 4SG	0.63	0.57	0.85	Under
12	9,720	17.7	7	Urban 4ST	0.39	0.41	0.69	Under
13	19,420	35.4	20	Urban 4SG	0.56	0.57	0.79	Under
16	7,580	13.8	5	Urban 4ST	0.36	0.41	0.73	Under
17	9,260	16.9	4	Urban 4SG	0.24	0.57	0.90	Under
18	9,360	17.1	8	Urban 4SG	0.47	0.57	0.89	Under
19	6,980	12.7	6	Urban 4ST	0.47	0.41	0.74	Under
22	6,610	12.1	6	Urban 4ST	0.50	0.41	0.75	Under
24	6,470	11.8	4	Urban 4ST	0.34	0.41	0.76	Under
25	6,470	11.8	3	Urban 4ST	0.25	0.41	0.76	Under
26	3,430	6.3	1	Urban 4ST	0.16	0.41	0.91	Under
27	3,260	5.9	1	Urban 4ST	0.17	0.41	0.92	Under
28	6,990	12.8	2	Urban 4ST	0.16	0.41	0.74	Under
29	9,000	16.4	15	Urban 3ST	0.91	0.25	0.49	**Over**
30	7,200	13.1	12	Urban 4ST	0.91	0.41	0.74	**Over**
31	8,050	14.7	9	Urban 4ST	0.61	0.41	0.72	Under
32	12,180	22.2	6	Urban 4ST	0.27	0.41	0.65	Under
33	11,710	21.4	5	Urban 3ST	0.23	0.25	0.45	Under
34	10,980	20.0	1	Urban 3ST	0.05	0.25	0.46	Under

Appendix K Bicycle Level of Traffic Stress Worksheets

Description	Functional Class	Class	*Bike lane width (ft)	Speed (mph)	# of Lanes**	LTS	Notes
Brewery Overpass Rd from I84 WB Ramp to E 2nd St	Arterial	Mixed Traffic		40	2	4	
E 2nd St from Brewery Overpass to 700ft East	Arterial	Mixed Traffic		30	2	4	Shoulder could be used as bike lane
US30 from St 700ft East of Brewery Overpass to US197	Arterial	Mixed Traffic		40	2	4	Shoulder could be used as bike lane
US197 from Lone Pine Dr to Fremont St	Arterial	Mixed Traffic		45	2	4	
US30 from Irvine St W to River Rd	Arterial	Bike lane without parking	7.5	30	1	1	
River Rd from US30 to 2000ft East	Collector	Bike lane without parking	6	40	1	4	
Division St	Collector	Mixed Traffic		35	2	3	Unmarked centerline
Rest of River Rd	Collector	Mixed Traffic		35	2	4	
Bargeway Rd	Collector	Mixed Traffic		30	2	2	Unmarked centerline
W 2nd St from Webber St to north end	Collector	Mixed Traffic		30	2	3	
Webber St from Bargeway to US30	Collector	Bike lane without parking	7	30	1	3	LTS 3 because of Right turn on Bargeway Rd
Webber St from US30 to 10th St NB							
Webber St from US30 to 10th St SB	Collector	Bike lane with parking	14.5	30	1	3	
Chenowith Loop Rd	Arterial	Bike lane with parking	13	25	1	3	
Hostetler Way W	Collector	Bike lane without parking	7	30	1	1	
W 7th ST	Collector	Mixed Traffic		25	2	1	unmarked center line
Walnut St from W 7th St to US30	Collector	Mixed Traffic		35	2	4	
Snipes St	Collector	Bike lane without parking		35	1	2	
W 8th St from Snipes St to Morrel Dr	Collector	Mixed Traffic		25	2	1	Unmarked centerline
W 6th St from Irvin St to Cherry Heights Rd	Arterial	Bike lane without parking	6.5	35	1	4	Right/Left lane turn increase LTS
W 6th St from Cherry Heights Rd to W 3rd St	Arterial	Mixed Traffic		35	2	4	Right/Left lane turn increase LTS
Trevitt St from Scenic Dr to W 6th St	Collector	Mixed Traffic		25	2	2	
Scenic Dr from Trevitt St to E 16th St	Collector	Mixed Traffic		25	2		
E 13th St from Jordan St to Kelly Ave	Collector	Mixed Traffic		25	2	1	Unmarked centerline
10th from Walnut St to Cherry Heights Rd NB	Arterial	Bike lane with parking	15	25	1	1	
10th from Walnut St to Cherry Heights Rd SB		Bike lane without parking	5			2	

Description	Functional Class	Class	*Bike lane width (ft)	Speed (mph)	# of Lanes**	LTS	Notes
10th from Cherry Heights Rd to Old Dufur Rd	Arterial	Mixed Traffic		25	2	2	
Mount Hood St from 16th St to 8th St							
Mount Hood St from Milk Creek Rd to 16th St	Arterial	Mixed Traffic		35	2	4	
Cherry Heights Rd from W 6th St to W 13th St SB	Arterial	Bike lane without parking	5	25	1	2	20 mph in the south because of school zone
Cherry Heights Rd from W 6th St to W 13th St NB		Bike lane with parking	15			1	
Cherry Heights Rd from US30 to 6th St	Arterial	Bike lane without parking	5	30	2	3	TWLTL
Mountain Hood							
W 3rd Pl	Arterial	Mixed Traffic		20	2	2	
3rd St from W 3rd Pl to Taylor St							
4th St from W 3rd Pl to Taylor St							
US30 from Lincoln St to Taylor St							
E 1st St from Union St to Madison St							
Union St from E 1st St to E 10th St							
Court St from E 1st St to Madison St							
Washington St from E 1st St to E 7th St							
Madison St							
Federal St	Collector						
E 7th St from Washington St to Kelly Ave	Arterial	Mixed Traffic		25	2	2	
Kelly Ave							
W 1st St	Arterial	Mixed Traffic		30	2	2	A multiuse trail parallel this road
US30 from Webber St to Lincoln St EB	Arterial	Bike lane without parking	6.5	35	1	3	
US30 from Webber St to Lincoln St EB		Bike lane with parking	14				
E 16th Pl from Kelly Ave to Dry Hollow Rd	Arterial	Mixed Traffic		25	2	2	
E 19th St from E 16th St to East end							20 during school
Dry Hollow Rd from E 16th St to E 14th St	Arterial	Mixed Traffic		35	2	4	
Dry Hollow Rd from E 9th St to E 14th St	Arterial	Mixed Traffic		25	2	2	
E 12th St from Kelly Ave to Thompson St	Arterial	Mixed Traffic		25	2	2	
Thompson St							

Description	Functional Class	Class	*Bike lane width (ft)	Speed (mph)	# of Lanes**	LTS	Notes
E 12th St from Thompsons St to Richmond St	Collector	Mixed Traffic		25	2	**2**	
Old Dufur Rd from Thompson St to Fremont St	Arterial	Mixed Traffic					
Fremont St E from Old Dufur Rd to US197				35	2	**4**	
E 4th St from Jefferson St	Collector	Mixed Traffic		25	2	**2**	
US30 from Taylor St to Brewery Overpass Rd	Arterial	Mixed Traffic		40	2	**4**	
Brewery Grade from US30 to 9th St	Arterial	Mixed Traffic		30	2	**3**	Shoulder could be used as bike lane
E 9th St from Brewery Grade to E 10th St	Collector	Mixed Traffic					
Columbia View Dr from E Knoll Dr to Summit Ridge Dr				25	2	**2**	

* includes width of parking if there is street parking

** for lanes, counts both direction if mixed traffic, one direction if bike lane